Wolf Creek
Nuclear Operating Corporation

Jaime H. McCoy
Site Vice President

May 25, 2021
WO 21-0015

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Docket No. 50-482: License Amendment Request (LAR) for Revision to the Emergency Plan

Commissioners and Staff:

Pursuant to 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Wolf Creek Nuclear Operating Corporation (WCNOC) hereby requests an amendment to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station (WCGS). This request proposes changes to the Emergency Plan related to WCGS on-shift staffing, specifically to:

1) eliminate a dedicated shift technical advisor (STA) position by allowing the STA functions to be combined with one or more of the required senior licensed operator positions (dual role SRO/STA); and
2) removal of one Nuclear Station Operator (Site Watch NSO).

Attachment I provides an evaluation and justification for the proposed changes. Attachment II contains a summary of proposed changes to the Emergency Plan. Enclosure I contains the proposed marked-up of Procedure AP 06-002, Radiological Emergency Response Plan (RERP). Enclosure II contains the proposed revised Emergency Plan (clean copy). Enclosure III provides the draft On-Shift Staffing Analysis Report performed to validate that these changes would not result in on-shift personnel being assigned responsibilities that would prevent the timely performance of the assigned functions.

WCGS has determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92, "Issuance of amendment." The basis for this determination is included in Attachment I. Pursuant to 10 CFR 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," Section (b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of this amendment.

The WCNOC Plant Safety Review Committee has reviewed this amendment application. In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," a copy of this amendment application, with attachments is being provided to the designated Kansas State official.

WCNOC requests review and approval of the proposed amendment by April 1, 2022. Once approved, the amendment will be implemented within 180 days from the date of issuance. The extended implementation period is desired in order to complete update of implementing procedures, and training; and will allow consideration of refueling outages and training cycles.

If you have any questions concerning this matter, please contact me at (620) 364-4156, or Ron Benham (620) 364-4204.

Sincerely,

Jaime H. McCoy

JHM/rlt

Attachments: I Evaluation of Proposed Change
II Emergency Plan Change Summary

Enclosures: I Proposed Markup of Procedure AP 06-002, Radiological Emergency Response Plan (RERP)
II Revised (clean copy) Procedure AP 06-002, Radiological Emergency Response Plan (RERP)
III Wolf Creek Nuclear Operating Corporation On-Shift Staffing Analysis, Draft Revision 2

cc: S. S. Lee (NRC), w/a, w/e
S. A. Morris (NRC), w/a, w/e
N. O'Keefe (NRC), w/a, w/e
K. S. Steves (KDHE), w/a, w/e
N. H. Taylor (NRC), w/a, w/e
Senior Resident Inspector (NRC), w/a, w/e

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Jaime H. McCoy, of lawful age, being first duly sworn upon oath says that he is Site Vice President of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Jaime H McCoy
Jaime H. McCoy
Site Vice President

SUBSCRIBED and sworn to before me this 25th day of May, 2021.

RHONDA L. TIEMEYER
Notary Public, State of Kansas
My Appointment Expires
January 11, 2022

Rhonda L. Tiemeyer
Notary Public

Expiration Date January 11, 2022

Wolf Creek
Nuclear Operating Corporation

Attachment: I

EVALUATION OF PROPOSED CHANGES

License Amendment Request for Revision to the Wolf Creek Nuclear Operating Corporation Emergency Plan

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, "Amendment of License or Construction Permit at Request of Holder," Wolf Creek Nuclear Operating Corporation (WCNOC) requests Nuclear Regulatory Commission (NRC) review and approval of a revision to the Wolf Creek Generating Station (WCGS) Radiological Emergency Response Plan (RERP) (Reference 6.1). The proposed revision includes:

1) Elimination of a dedicated shift technical advisor (STA) position by allowing the STA function to be combined with one or more of the required senior licensed operator positions (dual role SRO/STA – option 1 of USNRC Generic Letter 86-04, Policy Statement on Engineering Expertise On-Shift); and

2) Removal of one Nuclear Station Operator (NSO).

No change to the augmentation timing for key augmented ERO positions per the current WCGS RERP, Attachment D, "WCGS Minimum Staffing for Emergencies" are proposed in this amendment request.

2.0 DETAILED DESCRIPTION

The WCGS RERP, Attachment D, “WCGS Minimum Staffing for Emergencies”, specifies the minimum required number and composition of the on-shift complement for emergency response to a range of accident scenarios. WCNOC proposes to revise the WCGS RERP Attachment D to reduce minimum staffing affecting the following Major Functional Areas as established by NUREG-0654/FEMA-REP-1, Table B-1, “Minimum Staffing Requirements or NRC Licensees for Nuclear Power Plant Emergencies” (Reference 6.2):

- Plant Operations & Assessment of Operational Aspects
- Plant System Engineering, Repair & Mitigative Actions

Specifically, WCGS proposes to:

1) Eliminate the separate and dedicated Shift Technical Advisor (STA) position by combining one of the existing required SRO positions with the STA position into a dual-role (SRO/STA) position as provided in Option 1 of the Commission Policy Statement on Engineering Expertise on Shift contained in Generic Letter (GL) 86-04, "Policy Statement on Engineering Expertise on Shift," (Reference 6.3).

2) Use the Work Control Senior Reactor Operator (WCSRO) that currently fulfills the dedicated on-shift STA role during a declared emergency to instead assume the duties of the dedicated Emergency Notification System and Off-Site Communicator (ENS/OSC Communicator). Reassignment of the WCSRO to the ENS/OSC Communicator position will allow the Nuclear Station Operator (NSO) presently filling this position to perform the accident mitigation duties currently assigned to another NSO (i.e., Site Watch NSO or NSO#3 in the current NEI 10-05 On-Shift Staffing Analysis Report).

3.0 TECHNICAL EVALUATION

The specific standard for establishing a shift emergency organization to respond to emergency events appears in 10 CFR 50.47(b)(2) which states, in part, “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…” 10 CFR Part 50, Appendix E, Section IV.1 requires licensee emergency plans to contain, in part, the organization for coping with radiological emergencies and the activation of the emergency organization, including individuals assigned to the licensee’s ERO with a description of emergency assignments.

Regulatory Guide 1.219, Revision 1, “Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors” (Reference 6.4), provides guidance on methods acceptable to the NRC staff for implementation of 10 CFR 50.54(q) as it relates to making changes to emergency response plans. In accordance with Regulatory Position 4.2 of this guidance, this proposed change to the WCGS RERP on-shift minimum staffing is considered a reduction in effectiveness requiring prior NRC approval since it eliminates key positions identified in the existing approved RERP and reassigns the responsibilities of the eliminated positions to other key positions (e.g., multiple functions) and it would result in an ERO member being assigned duties that could be expected to be performed concurrently rather than sequentially.

Regulatory Issue Summary 2016-10, "License Amendment Requests for Changes to Emergency Response Organization Staffing and Augmentation" (Reference 6.5) provides examples of the scope and detail of information that should be provided in license amendment requests related to ERO staffing and augmentation to facilitate NRC review. As provided in RIS 2016-10, a licensee proposing a change to its emergency plans that reduce the licensee’s capability to perform an emergency planning function in the event of an emergency must meet the requirements of 10 CFR 50.54(q)(iv)(4), which states:

> *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).*

Following the above guidance, WCGS provides the following detailed review of each Major Functional Area described in Table B-1 to NUREG-0654/FEMA-REP-1 based on the proposed minimum on-shift staffing changes and completion of the major tasks required by NUREG-0654/FEMA-REP-1. In addition, a new analysis of on-shift responsibilities in accordance with 10 CFR 50, Appendix E, Section IV.A.9 evaluating the impacts associated with the proposed changes was performed and verified that ERO positions were not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan (Enclosure III). These analyses have determined that the proposed minimum staffing changes can be made while still maintaining the site’s ability to protect public health and safety.

Functional Analysis

This analysis evaluates the impact of reducing the required number of ERO positions on the ability of the on-shift ERO positions to perform the major tasks for the major functional areas of the WCNOC RERP. The analysis demonstrates that no degradation or loss of function would occur as a result of implementing the proposed change.

The following discusses the rationale based on this functional analysis for concluding that on-shift personnel can satisfactorily implement all EP functions as described in the WCGS RERP Attachment D, "WCGS Minimum Staffing for Emergencies". Enclosures I and II provide the revised RERP Attachment D with the proposed minimum staffing changes.

Functional Area: RERP Attachment D, Plant Operations & Assessment of Operational Aspects

The proposed change decreases the number of on-shift Nuclear Station Operators (NSO) from seven to six. These existing seven NSO positions were established in Revision 21 of the WCGS RERP as authorized by Amendment No. 220 to Renewed Facility Operating License No. NPF-42 granted on April 1, 2019 (Reference 6.6). That Amendment (and its enclosed NRC staff's safety evaluation) reviewed the addition of additional NSOs to replace the on-shift HP and Chemistry personnel previously used on the Fire Brigade. These additional Operations personnel also became available to assist with event mitigation and emergency response when not performing Fire Brigade duties.

Currently, one NSO is used to fill the dedicated ENS/OSC Communicator position (i.e., NSO#1/2 in the current NEI 10-05 On-Shift Staffing Analysis Report). The creation of a dual role SRO/STA (discussed in detail under Functional Area - Plant System Engineering, Repair & Mitigative Actions) would allow the Work Control Senior Reactor Operator (WCSRO) to now be assigned as the dedicated ENS/OSC Communicator. This reassignment of the dedicated ENS/OSC Communicator duties allows the NSO presently filling this position to perform the accident mitigation duties currently assigned to other NSOs.

Enclosure III provides the draft On-Shift Staffing Analysis (OSA) Report which was performed to validate that these changes would not result in on-shift personnel being assigned responsibilities that would prevent the timely performance of the assigned functions. This updated draft OSA was performed with 6 NSOs and did validate that the remaining on-shift personnel were not assigned responsibilities that would prevent the timely performance of the assigned functions.

Therefore, the proposed reduction in minimum staffing will not detract from the capability of on-shift personnel to support plant operations or the assessment of operational aspects at the start of an event and until the on-shift staff is augmented.

Functional Area: RERP Attachment D, Emergency Direction and Control

No changes are proposed to RERP Attachment D for the Emergency Director in this Major Functional Area.

While NEI 10-05 does not specifically address the role of Emergency Director, it does describe tasks associated with the Emergency Director (e.g. declaring emergency classification level, approving offsite protective action recommendations). The draft OSA in Enclosure III was performed using the Shift Manager in the dual role SRO/STA position and did validate that on-

shift personnel were not assigned responsibilities that would prevent the timely performance of the assigned functions. Therefore, this functional area is not adversely impacted by the proposed changes.

Functional Area: RERP Attachment D, Notification/Communication

Revision 21 of the WCGS RERP as authorized by Amendment No. 220 to Renewed Facility Operating License No. NPF-42 granted on April 1, 2019 (Reference 6.6) currently requires a single dedicated on-shift ENS/OSC Communicator. Even though WCGS intends to change the on-shift personnel filling this dedicated position, there is no proposed change to this position.

Enclosure III provides the draft On-Shift Staffing Analysis (OSA) Report which was performed to validate that this change in personnel filling the dedicated on-shift ENS/OSC Communicator would not result in on-shift personnel being assigned responsibilities that would prevent the timely performance of the assigned functions. This updated draft OSA was performed using the WCSRO as the dedicated on-shift ENS/OSC Communicator and did validate that on-shift personnel were not assigned responsibilities that would prevent the timely performance of the assigned functions.

Functional Area: RERP Attachment D, Radiological Accident Assessment & Support of Operational Accident Assessment

No changes are proposed to RERP Attachment D for this Major Functional Area.

Functional Area: RERP Attachment D, Plant System Engineering, Repair & Mitigative Actions

Following the accident at Three Mile Island Unit 2 in March 1979, the NRC identified the need for power reactor licensees to assign an on-shift technical advisor who could provide engineering and accident assessment expertise to the shift supervisor in the event of abnormal or accident conditions. This position was designated as the STA. The qualifications for the person occupying the STA position are contained in the "Commission Policy Statement on Engineering Expertise on Shift," published in the Federal Register on October 28, 1985 (50 FR 43621), Regulatory Guide (RG) 1.8, Revision 3 (May 2000), and NUREG-0737, "Clarification of TMI Action Plan Requirements," Item I.A1.1 , dated November 1980. The STA qualifications include a bachelor's degree in engineering or equivalent, plus specific training in plant design, layout, and controls.

The Commission's Policy Statement on Engineering Expertise on Shift provided two options for meeting the staffing requirements in 10 CFR 50.54(m)(2) and NUREG-0737, Item I.A.1.1. It allows either an on-shift dedicated STA, who meets the STA criteria of NUREG-0737, Item I.A.1.1, or an individual assigned to each operating shift crew who is a licensed Senior Reactor Operator (SRO) on the nuclear power unit(s) to which he or she is assigned who meets the STA requirements of NUREG-0737, Item I.A.1.1.

NRC Generic Letter (GL) 86-04, "Policy Statement on Engineering Expertise on Shift," described two options for meeting the requirements for providing engineering expertise on shift. Option 1 allowed for the elimination of a separate STA position by allowing one of the required SRO positions to be combined with the STA position into a dual-role SRO/STA position. Option 2 allowed for continuation of an NRC-approved STA program. GL 86-04 noted that the Commission encourages licensees to use Option 1, the dual-role SRO/STA. Under WCNOC's proposed change, the STA function to provide technical expertise on shift and may be fulfilled by either any STA-qualified Senior Reactor Operator (SRO) in the shift command structure. As such, WCNOC

proposes to implement Option 1 of the Commission Policy Statement on Engineering Expertise on Shift with this proposed revision to the WCGS RERP.

The WCNOC Technical Specification (TS) 5.2.2.e. currently contains wording comparable to TS 5.2.2.e in the Standard Technical Specifications, which allows elimination of a dedicated shift technical advisor (STA) position by allowing the STA functions to be combined with one or more of the required senior licensed operator positions. However, the WCGS RERP still lists the STA as a dedicated individual and not as a function. Per the current WCGS RERP, the dedicated Shift Technical Advisor (STA) is currently the on-shift position assigned for technical support. The STA functions in an oversight role for accident assessment and evaluation of operating conditions and providing the core/thermal hydraulic technical support function on shift. This proposed amendment eliminates the dedicated shift technical advisor (STA) position by allowing the STA functions to be combined with one or more of the required senior licensed operator positions (Option 1 of the Commission's Policy Statement).

Enclosure III provides the draft On-Shift Staffing Analysis (OSA) Report to support the proposed revision which was performed in accordance with NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," (Reference 6.7) to validate that this change to a dual role SRO/STA would not result in on-shift personnel being assigned responsibilities that would prevent the timely performance of the assigned functions. NEI 10-05 establishes a standard methodology for licensees to perform the required emergency plan staffing analysis. As documented in Interim Staff Guidance (ISG) NSIR/DPR-ISG-01, "Emergency Planning for Nuclear Power Plants," (Reference 6.8), the NRC has reviewed NEI 10-05 and found it to be an acceptable methodology to perform the required staffing analysis. As specifically provided in NEI 10-05, the Shift Manager may be assigned the role of STA. NEI 10-05 further clarifies that this is an acceptable collateral duty assignment per Generic Letter 86-04, Policy Statement on Engineering Expertise On-Shift.

Therefore, the Plant System Engineering, Repair & Mitigative Actions functions are not adversely impacted by the proposed changes. Core thermal hydraulics and repair and corrective action major tasks will continue to be performed by qualified on-shift and augmented personnel.

Functional Area: RERP Attachment D, Protective Actions (In-Plant)

No changes are being made to this functional area.

Functional Area: RERP Attachment D, Fire Fighting = Fire Brigade

No changes are being made to this functional area.

Functional Area: RERP Attachment D, Rescue Operations and First Aid

No changes are being made to this functional area.

Functional Area: RERP Attachment D, Site Access Control and Accountability

No changes are being made to this functional area.

Impact of personnel changes on ORO Radiological Emergency Preparedness (REP) Plans:

The proposed changes to the WCNOC RERP have been evaluated for impacts on the ERO and for the ability of off-site response organizations (OROs) to implement their U.S. Federal Emergency Management Agency (FEMA)-approved Radiological Emergency Preparedness (REP) Plans. Potential impacts on the ability of State and County response organizations to effectively implement their FEMA-approved REPs do not exist because no tasks that require interfacing with State and County response organizations are proposed for elimination. The WCNOC ERO includes staff that have dedicated responsibilities for interfacing with State and County representatives. During an emergency, personnel are dispatched to the State and County EOCs to act as communication liaisons between the EOCs and plant technical staff and to provide clarification of emergency response information. These positions remain part of the WCNOC ERO.

Conclusion

WCNOC has reviewed the proposed changes against the planning standards in 10 CFR 50.47(b) and the requirements in 10 CFR Part 50, Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities,” and has concluded that the standards and requirements will continue to be met. An evaluation of the proposed reductions in ERO on-shift staffing to validate the ability of the proposed on-shift and ERO organization to respond to an emergency has been performed (Enclosure III), and the proposed changes continue to support the major functional areas of the emergency plan, continue to ensure the protection of the health and safety of the public and site personnel, and will not present a significant burden to the remaining on-shift personnel.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The regulatory requirements and guidance applicable to the proposed change are as follows:

10 CFR 50.47(b) states:

> *(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 proposed amendment reduces the minimum on-shift staff from 16 to 14 in the WCGS RERP by eliminating the dedicated STA position and one Nuclear Station Operator (Site Watch NSO). This change does not adversely impact emergency responsibilities of various supporting organizations and the principal response organization continues to contain staff necessary to respond and to augment its initial response on a continuous basis.

10 CFR 50, Appendix E, Section IV, Part A states in part:

> *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. Specifically, the following shall be included:*
>
> *… 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.*

Section IV.A provides requirements on the emergency organization including a description of the ERO with detailed discussion of, in part, plant staff emergency assignments. The WCGS RERP staffing studies were re-evaluated and updated to ensure on-shift staffing continues to be adequate to perform critical functions until relieved by the augmented ERO. Therefore, the proposed change to the WCGS RERP continue to meet the applicable 10 CFR 50, Appendix E requirements.

NUREG-0737 Enclosure 3

Item I.A.1.1 position requires each licensee to provide an on-shift technical advisor to the shift supervisor. The position also describes the educational and training qualifications required for the STA function. The proposed amendment associated with the individual that provides technical advisory support would change the STA role from a position to function. Following implementation of the proposed amendment to the WCGS RERP, an on-shift individual will continue to be available to provide advisory technical support to the unit operations shift crew in the areas of thermal hydraulics, reactor engineering, and plant analysis with regard to the safe operation of the unit and will meet the qualifications specified by the Commission policy statement on engineering expertise, including those necessary to perform the technical advisory function for the unit.

Regulatory Guide 1.101 and NUREG-0654/FEMA-REP-1

Regulatory Guide (RG) 1.101, “Emergency Planning and Preparedness for Nuclear Power Reactors” (Reference 6.9), provides guidance on methods acceptable to the NRC staff for implementing specific parts of NRC regulations (i.e. 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50). RG 1.101 endorses NUREG-0654/FEMA-REP-1 (NUREG-0654), “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants” (Reference 6.2), which provides specific acceptance criteria for complying with the standards set forth in 10 CFR 50.47(b). These criteria provide a basis for NRC licensees, and state and local governments to develop acceptable radiological emergency plans and improve emergency preparedness.

In NUREG-0654, Section II, “Planning Standards and Evaluation Criteria,” Evaluation Criteria II.B.1 through II.B.5 address the 10 CFR 50.47(b)(2) planning standard. Evaluation Criteria II.B.1 specifies the on-site emergency organization of plant staff personnel for all shifts, and its relation to the responsibilities and duties of the normal shift complement. Evaluation Criteria 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 states general guidance concerning the off-site emergency organization to allow licensees some flexibility in the number of on-shift staff required by emergency plans for response 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.

This license amendment request proposes to reduce on-shift staff as previously described. The proposed changes to the RERP continue to meet the intent of NUREG-0654, Table B-1 (i.e., continues to cover the Emergency Preparedness (EP) Functions provided in Table B-1).

Therefore, the proposed change to reduce the minimum on-shift staff from 16 to 14 in the WCGS RERP continues to meet the minimum on-shift staffing as indicated in NUREG-0654, Table B-1.

10 CFR 50.54(q)(1)(iii) states:

> *Emergency planning function means a capability or resource necessary to prepare for and respond to a radiological emergency, as set forth in the elements of section IV, of appendix E to this part [Part 50] and, for nuclear power reactor licensees, the planning standards of §50.47(b).*

10 CFR 50.54(q)(1)(iv) states:

> *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.*

10 CFR 50.54(q)(2) states in part:

> *A holder of a license under this part, … 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).*

10 CFR 50.54(q)(3) states:

> *The licensee may make changes to its emergency plan without NRC approval only if the licensee performs and retains an analysis demonstrating that the changes do not reduce the effectiveness of the plan and the plan, as changed, continues to meet the requirements in appendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b).*

10 CFR 50.54(q)(4) states:

> *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).*

WCNOC, as required under 10 CFR 50.54(q)(4), is hereby submitting proposed revisions to the WCNOC RERP for NRC approval prior to implementation. The proposed changes continue to meet the provisions of 10 CFR 50.47(b) as the WCGS RERP will continue to have on-site and off-site emergency responsibilities and provide adequate staffing to provide facility accident responses. Further, the current WCGS RERP 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). The proposed changes reduce on-shift staffing as described previously. Therefore, the proposed change is considered a reduction in effectiveness as defined in 10 CFR 50.54(q)(1)(iv) and requires submittal of a license amendment request to the NRC based on 10 CFR 50.54(q)(4) in accordance with 10 CFR 50.90.

Regulatory Guide 1.219, Revision 1, "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors" (Reference 6.4), provides guidance on methods acceptable to the NRC staff for implementation of 10 CFR 50.54(q) as it relates to making changes to emergency response plans. With the proposed changes, the WCGS RERP 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).

4.2 Precedent

Eliminating a dedicated STA position by allowing advisory technical support to be provided by senior reactor operators has been approved for multiple licensees. The most recently approved amendment and closest in scope was:

- Amendment No. 222 to Renewed Facility Operating License No. NPF-2 and Amendment No. 219 to Renewed Facility Operating License No. NPF-8 for the Joseph M. Farley Nuclear Plant, Units 1 and 2 (Farley), respectively; Amendment No. 295 to Renewed Facility Operating License No. DPR-57 and Amendment No. 240 to Renewed Facility Operating License No. NPF-5 for the Edwin I. Hatch Nuclear Plant, Units 1 and 2 (Hatch), respectively; and Amendment No. 199 to Renewed Facility Operating License NPF-68 and Amendment No. 182 to Renewed Facility Operating License NPF-81 for the Vogtle Electric Generating Plant (Vogtle), Units 1 and 2, respectively, dated April 26, 2019 (NRC ADAMS Accession No. ML19064A774) allows one of the required on-shift SRO positions to be combined with the required STA position and to serve in a dual SRO/STA position. NRC staff's safety evaluation accompanying these Amendments also included analysis of the conforming changes to the on-shift minimum staffing tables to reflect the combined SRO/STA role and the reduction in total on-shift complement accordingly.

WCNOC Technical Specification (TS) 5.2.2.e. currently contains wording comparable to TS 5.2.2.e of the Standard Technical Specifications which allows elimination of a dedicated shift technical advisor (STA) position by allowing the STA functions to be combined with one or more of the required senior licensed operator positions. Therefore, WCNOC requires no change to the TS and only requests approval of the conforming change to the RERP.

4.3 No Significant Hazards Consideration Determination

Pursuant to 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," WCNOC hereby requests an amendment to the Renewed Facility Operating License No. NPF-42 for WCGS. This amendment request proposes a change to the Emergency Response Organization as specified in the WCNOC Radiological Emergency Response Plan (RERP).

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

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

   Response: No

The proposed change to the WCNOC RERP is administrative in nature. This proposed change does not alter accident analysis assumptions, add any initiators, or affect the function of plant systems or the manner in which systems are operated, maintained, modified, tested, or inspected. The proposed change does not require any plant modifications which affect the performance capability of the structures, systems, and components (SSCs) relied upon to mitigate the consequences of postulated accidents, and has no impact on the probability or consequences of an accident previously evaluated.

Therefore, the proposed 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 change to the WCNOC RERP is administrative in nature. This proposed change does not alter accident analysis assumptions, add any initiators, or affect the function of plant systems or the manner in which systems are operated, maintained, modified, tested, or inspected. The proposed change does not require any plant modifications which affect the performance capability of the SSCs relied upon to mitigate the consequences of postulated accidents, and does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

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

Response: No

Plant safety margins are established through limiting conditions for operation, limiting safety systems settings, and safety limits specified in the technical specifications. The proposed change to the WCNOC Emergency Plan is administrative in nature. Since the proposed change is administrative in nature, there are no changes to these established safety margins.

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

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

4.4 Conclusions

In conclusion, based on the considerations discussed above: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; (2) such activities will be conducted in compliance with the Commission’s regulations; and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

WCNOC has evaluated the proposed change and has determined that the change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluent that may be released off-site, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

6.1 Wolf Creek Nuclear Operating Corporation Procedure AP 06-002, Radiological Emergency Response Plan (RERP), Rev. 21.

6.2 NUREG- 0654/FEMA-REP-1 (NUREG-0654), Revision 1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants” (ADAMS Accession No. ML040420012).

6.3 NRC Generic Letter 86-04, "Policy Statement on Engineering Expertise on Shift," February 13, 1986. (NRC ADAMS Accession No. ML031150270).

6.4 Regulatory Guide 1.219, Revision 1, “Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors” (ADAMS Accession No. ML16061A104).

6.5 USNRC RIS 2016-10, License Amendment Requests for Changes to Emergency Response Organization Staffing and Augmentation, August 2016 (ADAMS Accession No. ML16124A002).

6.6 Amendment No. 220 to Renewed Facility Operating License No. NPF-42, Wolf Creek Generating Station, Unit 1 - Issuance of Amendment RE: Revision to The Emergency Plan (EPID L-2018-LLA-0138), dated April 1, 2019 (ADAMS Accession No. ML19052A546).

6.7 NEI 10-05, “Assessment of On-Shift Emergency Response Organization Staffing and Capabilities” (ADAMS Accession No. ML111751698).

6.8 NSIR/DPR-ISG-01, “Interim Staff Guidance – Emergency Planning for Nuclear Power Plants” (ADAMS Accession No. ML113010523).

6.9 Regulatory Guide (RG) 1.101, Revision 5, “Emergency Planning and Preparedness for Nuclear Power Reactors” (ADAMS Accession No. ML050730286).

Wolf Creek
Nuclear Operating Corporation

ATTACHMENT II

Emergency Plan Change Summary

Emergency Plan Change Summary

RERP Section	Before (Rev. 21)	After (Pending Revision Number)	Reason for Change
Cover page/Header	Revision 21	Revision TBD	Reflect the LAR changes.
6.5.9	<u>Shift Technical Advisor (STA)</u> The Shift Technical Advisor reports to the Shift Manager and performs STA requirements as assigned by the NRC.	deleted	This amendment will eliminate a dedicated shift technical advisor (STA) position by allowing the STA functions to be combined with one or more of the required senior licensed operator positions (dual role SRO/STA – Option 1 of GL 86-04).
6.3.10 and 6.5.11	6.5.10 and 6.5.11	6.5.9 and 6.5.10	Renumber these sections due to deletion of 6.5.9.
Attachment D, Functional Area – Plant Operations & Assessment of Operational Aspects – On-Shift	Shift Manager (SRO) 1 Control Room Supervisor (CRS) 1 Reactor Operator (RO) 2 Nuclear Station Operator 7	Shift Manager (SRO) 1 Control Room Supervisor (CRS) 1 Reactor Operator (RO) 2 Nuclear Station Operator 6	Eliminate one Nuclear Station Operator (i.e., Site Watch NSO) due to reassignment of the ENS/OSC Communicator to the on-shift Work Control SRO (WCSRO). The NSO presently credited as the dedicated ENS/OSC Communicator will perform the accident mitigation duties previously assigned to the Site Watch NSO, allowing this position to be eliminated.
Attachment D, Functional Area – Plant System Engineering, Repair, & Mitigative Actions	Shift Technical Advisor 1****	Senior Reactor Operator 1*	This amendment will eliminate a dedicated shift technical advisor (STA) position by allowing the STA functions to be combined with one or more of the required senior licensed operator positions (dual role SRO/STA – Option 1 of GL 86-04).
Attachment D, Total (On-Shift)	16	14	Reflects elimination of the dedicated STA position and the Site Watch NSO.

RERP Section	Before (Rev. 21)	After (Pending Revision Number)	Reason for Change
Figure 2, Minimum Shift Staffing	NOTE STA is required in Modes 1-4. An SRO capable of performing STA functions is required in Modes 5, 6 and defueled.	Delete NOTE	This amendment will eliminate a dedicated shift technical advisor (STA) position by allowing the STA functions to be combined with one or more of the required senior licensed operator positions (dual role SRO/STA – Option 1 of GL 86-04).
Figure 2, Minimum Shift Staffing	Block labelled SHIFT TECHNICAL ADVISOR (STA) (1) and STA = Shift Technical Advisor	Deleted	This amendment will eliminate a dedicated shift technical advisor (STA) position by allowing the STA functions to be combined with one or more of the required senior licensed operator positions (dual role SRO/STA – Option 1 of GL 86-04).

ENCLOSURE I

Wolf Creek

an evergy generating station

AP 06-002

RADIOLOGICAL EMERGENCY RESPONSE PLAN (RERP)

RESPONSIBLE ORGANIZATION

Emergency Planning

Revision Number	~~21A~~TBD
Use Category	Information
Administrative Controls Procedure	Yes
Management Oversight Evolution	No
Program Number	06

TABLE OF CONTENTS

1.0 PURPOSE

1.1 The purpose of the Wolf Creek Generating Station (WCGS) Radiological Emergency Response Plan (RERP) is to classify emergencies, assign responsibilities for actions, and to establish the lines of authority and communications to protect the public and plant personnel in the event of an emergency.

2.0 SCOPE

2.1 The RERP has been developed in accordance with 10CFR Part 50, Paragraph 50.47 and Appendix E, Regulatory Guide 1.101 and generally follows the guidelines of NUREG 0696 and 0654. The RERP is sensitive to a broad spectrum of emergency conditions which have been postulated for a commercial pressurized water reactor. Although the probability of an accident is low, the RERP is maintained to assure the safety and well-being of plant personnel and members of the public in the vicinity of WCGS.

2.2 The RERP interfaces with several related documents such as the Administrative Procedures (APs) and Emergency Plan Procedures (EPPs). Detailed instructions necessary to support the RERP are included in these procedures and are available for training, drill, and actual emergency use. The RERP references the WCGS Fire and Security Plans, Vendor contingency plans as well as those of medical support facilities and the Institute of Nuclear Power Operations (INPO). This document has been designed to coordinate with the State Emergency Operations Plan and the Coffey County Contingency Plan for Incidents Involving Commercial Nuclear Power, which govern the activities of these support groups in response to events at WCGS.

2.3 The RERP is based on a graduated, escalating level of emergency response which is activated as conditions at the plant warrant. This approach provides the flexibility necessary to ensure adequate emergency response to a spectrum of possible events. The RERP is designed to control emergency response activities ranging from initial event detection, classification of the event, notification of off-site authorities and providing protective action recommendations to the county and state.

2.4 The RERP reflects three chief phases of activation. First the response is dominated solely by the site staff, next the on-site and off-site public information facilities are jointly activated, and finally the recovery efforts are performed by site, public information facilities, vendor, and other critical support groups.

2.5 The WCGS normal operating organization and its functional responsibilities are described in the WCGS Technical Specifications, Administrative Procedures, Human Resources company organization charts and the WCGS Updated Safety Analysis Report (USAR). No further discussion of the normal operating organization is contained within the RERP.

2.6 The WCGS design bases accidents and various plant systems are listed and described in the WCGS Technical Specifications and USAR. No further discussion of these accidents or systems is contained within the RERP.

2.7 The owners of WCGS do not respond to the site during emergency events for augmentation. The Wolf Creek Nuclear Operating Corporation organization functions from the site during normal everyday operations.

3.0 REFERENCES AND COMMITMENTS

3.1 References

3.1.1 Coffey County Contingency Plan for Incidents Involving Commercial Nuclear Power (County Plan)

3.1.2 The State of Kansas Radiological Emergency Response Plan for Nuclear Facilities

3.1.3 Updated Safety Analysis Report (USAR)

3.1.4 NUREG 0654, Criteria For Preparation And Evaluation Of Radiological Emergency Response Plans And Preparedness In Support Of Nuclear Power Plants

3.1.5 NUREG 0696, Functional Criteria For Emergency Response Facilities

3.1.6 NUREG 0737, Clarification Of TMI Action Plan Requirements

3.1.7 Title 10, Code Of Federal Regulations, Part 50

3.1.8 Regulatory Guideline 1.101

3.1.9 Regulatory Guide 1.145

3.1.10 PIR 2002-1524, Minimum Staffing Requirements

3.1.11 Wolf Creek On-Shift Staffing Analysis

3.1.12 Wolf Creek Generating Station Development of Evacuation Time Estimate (October 2012)

3.1.13 SAP 98-154, Letter 98-02120, Transmittal of Radiation Sources for Wolf Creek Letter Report, November 18, 1998

3.1.14 SAP 99-145, Letter 99-01466, Core Inventory Radiation Sources, September 3, 1999

3.2 Commitments

3.2.1 APF 06-002-02, EMERGENCY ACTION LEVELS TECHNICAL BASES, and APF 06-003-03, EAL CLASSIFICATION MATRIX are required to have a 50.54(q) review performed for each revision.

3.2.2 RCMS #05-118, NRC Bulletin 2005-02 Guidance For Drills And Exercises

3.2.3 CR 00086306, Minimum Staffing Requirements not Met

3.2.4 SAP 98-154, Letter 98-02120, Transmittal of Radiation Sources for Wolf Creek Letter Report, November 18, 1998

3.2.5 SAP 99-145, Letter 99-01466, Core Inventory Radiation Sources, September 3, 1999

4.0 DEFINITIONS

4.1 Administrative Procedures (APs)

4.1.1 Procedures which provide programmatic responsibilities and are typically used to solve problems, assemble documentation, process information, and present results of administrative functions.

4.1.2 Administrative procedures control activities affecting quality or nuclear safety.

4.2 As Low As Reasonably Achievable (ALARA)

4.2.1 Making every reasonable effort to maintain exposures to radiation as far below dose limits as is practical, consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to benefits to the public health safety, and other societal and socioeconomic considerations.

4.3 Alert

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

4.4 Alert and Notification System (ANS)

4.4.1 Alert and notification systems are the means used for prompt notification of the public of protective measures.

4.5 Assessment Actions

4.5.1 Those actions taken during or after an accident to obtain and process information that is necessary to make decisions to implement specific emergency measures.

4.6 Coffey County Emergency Operations Center (County EOC)

4.6.1 The base of operations for the Coffey County Emergency Response Organization.

4.7 Consultant/Vendor

4.7.1 The Nuclear Steam System Supplier (NSSS), Architect/Engineer, and other organizations who have available multidiscipline teams ready to support emergency response and Recovery Operations.

4.8 Control Room

4.8.1 The location at the WCGS from which the reactor and its auxiliary systems are normally controlled.

4.9 Drill

4.9.1 A supervised activity used to develop and maintain skills. On the spot correction of erroneous performance is permitted.

4.10 Emergency Action Levels (EALs)

4.10.1 A pre-determined, site-specific, observable threshold for an Initiating Condition that, when met or exceeded, places the plant in a given emergency classification level.

4.11 Emergency Alert System (EAS)

4.11.1 A coordinated network of broadcasters (e.g. Radio, Television, cable) that allows the President to address the nation, Governors to address their State and public safety officials to address local citizens with emergency information.

4.12 Emergency Classification Level

4.12.1 One of a set of names or titles established by the US Nuclear Regulatory Commission (NRC) for grouping off-normal events or conditions according to (1) potential or actual effects or consequences, and (2) resulting in on-site and off-site response actions. The emergency classification levels, in ascending order of severity, are: Unusual Event (UE), Alert, Site Area Emergency (SAE) and General Emergency (GE).

4.13 Emergency Operations Facility (EOF)

4.13.1 This facility serves as a base of operations for all emergency plant support activities, site environmental surveillance, communications with supporting agencies, and the WCGS Emergency Organization.

4.14 Emergency Plan Procedures (EPPs)

4.14.1 Specific procedures providing step-by-step actions to implement the WCGS Radiological Emergency Response and Recovery Plans, and to provide guidance to improve or terminate an emergency situation.

4.15 Evacuation Registration Center

4.15.1 Facility designated for receiving personnel evacuating the Emergency Planning Zone (EPZ) for accountability, contamination monitoring and decontamination.

4.16 Exclusion Area

4.16.1 That area within a 1200-meter radius of the Containment Building in which WCGS has the authority to determine all activities including exclusion or removal of persons and property from the area.

4.17 Executive Management

4.17.1 Those members of WCGS management at the vice president level and above.

4.18 Exercise

4.18.1 An event that simulates a radiological emergency condition, incorporates the integrated capability of the basic elements existing within the Radiological Emergency Response Plan (RERP). These events are normally evaluated by FEMA / NRC.

4.19 General Emergency (GE)

4.19.1 Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with the 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 off-site for more than the immediate site area.

4.20 Hostile Action

4.20.1 An act toward a Nuclear Power Plant (NPP) or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidates the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the NPP.Non-terrorism-based EALs should be used to address such activities (e.g., violent acts between individuals in the owner controlled area).

4.21 Hostile Force

4.21.1 One or more individuals who are engaged in a determined assault, overtly, or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

4.22 Immediate Notification

4.22.1 Notification made to State of Kansas and Coffey County authorities within 15 minutes of a declared emergency at WGCS.

4.23 Imminent

4.23.1 The trajectory of events or conditions is such that an EAL will be met within a relatively short period of time regardless of mitigation or corrective actions.

4.24 Initiating Condition

4.24.1 An event or condition that aligns with the definition of one of the four emergency classification levels by virtue of the potential or actual effects or consequences.

4.25 Integrated Public Alert Warning System (IPAWS)

4.25.1 IPAWS is a modernization and integration of the nation's alert and warning infrastructure.

4.26 Joint Information Clearinghouse (JIC)

4.26.1 The facility where news statement and news conference materials for the media are prepared.

4.27 State of Kansas Emergency Operations Center (State EOC)

4.27.1 The command-and-control center for the state.

4.28 Licensed Operators

4.28.1 WCGS Reactor Operators and Senior Reactor Operators who are licensed under 10CFR55 and who stand watches on shift and report to the Shift Manager.

4.29 Media Center (MC)

4.29.1 Facility utilized as a focal point for giving information to the media through news conferences.

4.30 Notification of Unusual Event

4.30.1 Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.

4.31 Off-Site

4.31.1 Any area outside the Exclusion Area of WCGS.

4.32 On-Site

4.32.1 Any area inside the Exclusion Area of WCGS.

4.33 Operations Support Center (OSC)

4.33.1 A staging area for emergency teams to support the emergency response effort.

4.34 Owner Controlled Area

4.34.1 Property contiguous to the reactor site and acquired by fee, title or easement for Wolf Creek Generating Station for which public access is limited.

4.35 Protected Area (PA)

4.35.1 An area encompassed by physical barriers and to which access is controlled. The Protected Area refers to the designated security area around the process buildings and is depicted in USAR.

4.36 Protective Actions

4.36.1 Those emergency measures taken before or after a release of radioactive material has occurred for the purpose of preventing or minimizing radiological exposures to personnel.

4.37 Protective Action Guides (PAGs)

4.37.1 Guides promulgated by the Environmental Protection Agency (EPA) which set dose limits for the evacuation of the public during an accident condition at a nuclear power plant.

4.38 Public Inquiry Room

4.38.1 The facility provides Media Monitoring and Rumor Control functions for WCGS, the State and Coffey County.

4.39 Radiologically Controlled Area (RCA)

4.39.1 An area to which access is controlled by WCGS for purposes of protection of individuals from exposure to radiation or radioactive materials.

4.40 Recovery

4.40.1 Post-emergency efforts initiated to restore WCGS to full operation or place the plant in a safe shutdown condition until full operation can be resumed.

4.41 Site Area Emergency (SAE)

4.41.1 Events are in process or have occurred which involve an actual or likely major failure 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.

4.42 Technical Support Center (TSC)

4.42.1 The TSC serves as a center outside of the Control Room that acts in support of the command-and-control function and houses the OSC organization. Plant status and diagnostic information are available at this location for use by technical and management personnel in support of reactor command-and-control functions.

4.43 Wolf Creek Joint Media Center

4.43.1 The Wolf Creek Joint Media Center is central location for coordinated dissemination of public information during emergencies.

5.0 RESPONSIBILITIES

5.1 Site Emergency Manager

5.1.1 Assumes command and control of the emergency and directs on-site response to stabilize plant conditions.

5.2 Off-Site Emergency Manager

5.2.1 Assumes command and control of the emergency and interfaces with off-site agencies.

5.3 Manager Emergency Planning

5.3.1 Ensures the Emergency Planning and Preparedness Program is implemented and maintained as required to protect the health and safety of the public.

5.3.2 Ensures changes to the overall Emergency Planning and Preparedness Program meets the standards of 10CFR50.47(b) and the requirements of 10CFR50, Appendix E.

5.4 Manager Quality

5.4.1 Ensures a review of the WCGS Emergency Planning and Preparedness Program will be performed at least once every twelve months in accordance with 10CFR 50.54(t).

5.5 Chief Executive Officer and Chief Nuclear Officer

5.5.1 Maintains overall authority and responsibility for the WCGS Emergency Preparedness Program.

5.6 Public Information Officer (PIO)

5.6.1 The PIO has the authority and responsibility for the WCGS Public Information Organization and all plant information disseminated to the media.

5.7 Shift Manager (SM)

5.7.1 The Senior Reactor Operator designated by WCGS management with immediate on-site authority and responsibility for the safe and proper operation of the plant. This position is staffed at all times. The Shift Manager is responsible for the initial evaluation of any abnormal or emergency situation and for directing the appropriate response. The Shift Manager assumes responsibilities of the Emergency Manager until relieved.

5.8 Command and Control

5.8.1 Transfer of command and control flows from the Control Room to the Technical Support Center (TSC) and then to the Emergency Operations Facility (EOF). Upon classifying an event, the Shift Manager assumes the role of Emergency Manager. The Site Emergency Manager relieves the Shift Manager of Emergency Manager duties at an Alert or higher emergency classification. The Site Emergency Manager may relieve the Shift Manager of Emergency Manager duties at an Unusual Event upon request from the Shift Manager. After the EOF has been activated, the duties of Emergency Manager are transferred from the Site Emergency Manager to the Off-site Emergency Manager.

6.0 PROCEDURE

6.1 Site Description

6.1.1 WCGS is a Pressurized Water Reactor (PWR) nuclear generating station operated by Wolf Creek Nuclear Operating Corporation (WCNOC).

6.1.2 WCGS is located near the center of Coffey County, Kansas (KS), about 3.5 miles northeast of Burlington, the county seat, 90 miles southwest of Kansas City, MO and 55 miles south of the state capital Topeka, KS.

6.1.3 The immediate site environs are sparsely populated. Burlington and New Strawn are the major population centers. John Redmond Reservoir (JRR) and Coffey County Lake (CCL) are the major recreational facilities. Most of the seasonal or daily shifts in population are associated with recreational areas around JRR and CCL. Approximately 70% of the annual visitors to the John Redmond Reservoir and Coffey County Lake come to the area during the summer months.

6.1.4 The 10-mile Plume Exposure Emergency Planning Zone (EPZ) is a major consideration in the RERP. Approximately 99% of the 10-mile EPZ is located within Coffey County and 1% within Anderson County. The EPZ has been defined by developing sub-zones based upon natural and political subdivisions. These have been described for evacuation zones approximating 2, 5 and 10-mile radial rings. This distribution allows ready identification of areas to be evacuated and facilitates public recognition of subzones in which they work or reside. FIGURE 1, EFFECTIVE 10 MILE EPZ, SUBZONES AND EVACUATION ROUTES, presents the 2, 5 and 10-mile radial zones and subzones which provides the basis for the design of an alert and notification system.

6.1.5 The total population of the effective 10-mile EPZ is shown in ATTACHMENT B, SUBZONE EVACUATION TIMES. With the exception of Burlington and the other population centers listed in ATTACHMENT A, EFFECTIVE 10-MILE POPULATION CENTERS, the population density of the effective 10-mile EPZ is approximately 4.4 persons per square mile. Other than the WCGS, there are no large industries in the area.

6.1.6 Principal geographical features within the effective 10-mile EPZ are the Neosho River, JRR, and CCL. The land around WCGS is flat with scattered low hills. Dense vegetation in the form of large trees exists on the banks of the river and in recreational areas.There are no topographical features within the effective 10-mile EPZ that significantly influence the design of the Alert and Notification System.

1. Sparsely populated farm land comprises the majority of the effective 10-mile EPZ.

2. The site also demonstrates favorable topography, demography, and meteorology, which have been factored into many analyses that support the emergency planning effort.

3. The Neosho River is oriented northwest-southeast and extends to within 3 miles southwest of the plant.

4. The main dam of the John Redmond Reservoir is 3.5 miles west of the plant. This water conservation pool is approximately 4 miles in diameter with a surface area of 15 square miles.

5. The Coffey County Lake is approximately 7 miles long with a normal surface area of 8 square miles.

6.1.7 The meteorological conditions within the effective 10-mile EPZ are characterized by a distinctly continental climate with warm humid summers and highly variable winter weather. Maritime tropical air originating over the Gulf of Mexico is the dominant air mass from June through August. This air mass is quite humid resulting in considerable thunderstorm activity. From November through February, continental polar air dominates the climate.

6.2 Emergency Classifications

6.2.1 10 CFR Part 50, Appendix E, Section IV.C, requires a classification scheme of four specific levels of emergencies. Regulatory Guide 1.101, Revision 4, endorsed the guidance of NEI 99-01, Revision 4, as acceptable to the NRC staff as an alternative method to that described in Appendix 1 to NUREG 0654. NEI 99-01, Revision 6, was reviewed by the NRC and found to be acceptable for use by licensees seeking to upgrade their EALs as endorsed by the NRC in a letter to NEI dated March 23, 2013.

6.2.2 An emergency class is a qualitative estimate of the status of the plant. Inputs to the emergency classification system include the status of plant systems and the levels of radiation in plant areas and effluents. However, an emergency class does not give a qualitative or quantitative estimate of the subsequent status of the plant or radioactive release.

6.2.3 The emergency classes are used by off-site authorities to determine the level of preplanned actions to be taken by their emergency organizations. Protective actions taken on behalf of members of the public are the legal responsibility of state and local government.

1. The functional interfaces between WCGS and other emergency organizations are shown in FIGURE 6, EMERGENCY ORGANIZATION INTERFACES.

6.2.4 The classification system used at WCGS is an approach that ranges from primarily event-based for Unusual Event to primarily symptom or barrier-based for General Emergencies. This is to better assure that timely recognition and notification occurs, that events occurring during refueling and cold shutdown are appropriately covered, and that multiple events can be effectively treated.

6.2.5 The Emergency Action Levels (EALs) are contained in APF 06-002-02, EMERGENCY ACTION LEVELS TECHNICAL BASES and APF 06-002-03, EAL CLASSIFICATION MATRIX. The EALs have been developed and agreed upon by WCGS, the State of Kansas and Coffey County and approved by the NRC.

1. The EALs are reviewed annually by the State and County.

6.2.6 10 CFR Part 50, Appendix E, Section IV.C.2, requires licensees to establish and maintain the capability to assess, classify, and declare an emergency condition within 15 minutes after the availability of indications to plant operators that an emergency action level has been exceeded and shall promptly declare the emergency.

6.2.7 Each emergency classification causes certain actions to happen such as notifications, activation and evacuation.

1. An NUE requires plant personnel, the County and State to be notified. No evacuation or activation required.

2. An Alert requires plant personnel, the County and State to be notified. The Emergency Response Organization (ERO) is called out and the emergency facilities are activated. Accountability may be performed if necessary.

3. A Site Area Emergency requires plant personnel, the County and State to be notified. The ERO is called out and the emergency facilities are activated. The protected area is evacuated of non-responding personnel for accountability. JRR and CCL are evacuated. Accountability for site personnel is performed.

4. A General Emergency requires plant personnel, the County and State to be notified. The ERO is called out and the emergency facilities are activated. The site is evacuated of non-responding personnel. JRR and CCL are evacuated. Accountability for site personnel is performed.

6.3 Emergency Measures

6.3.1 Protective actions to minimize personnel exposure are taken when an incident has occurred, or may occur, which could result in a fission product barrier challenge or breach. In addition, protective actions are taken for personnel on-site for situations such as fires or flooding, where personnel safety is threatened.

6.3.2 Emergency measures consist of assessment, corrective, and protective actions. The Shift Manager and Senior Reactor Operators assume immediate responsibility for accident assessment and mitigation. The RERP and detailed emergency actions are based on the assumption that, in an emergency, licensed operators take appropriate measures to maintain or return the facility to a safe condition, in accordance with operating license conditions and the technical specifications.

1. Callout of the ERO to augment the on-shift staff and to activate the Emergency Facilities is performed at an Alert or higher classification or whenever augmentation is deemed necessary.

6.3.3 Immediate and Follow-up notifications made to State and County authorities provide information for their use in making prompt decisions for notifying the public and ordering off-site protective actions.

1. Immediate notifications are made for each emergency classification.

2. Immediate notifications are made to the Coffey County Sheriff dispatcher and the Kansas Division of Emergency Management State Duty Officer within 15 minutes.

(Step 6.3.3. continued on next page)

Step 6.3.3. (continued from previous page)

3. The notification form contains information agreed upon by WCGS, the State and County for each of the Immediate and Follow-up notifications. The following is a list of information that may be on the form:

   - o Name of facility
   - o Date and time of classification
   - o Classification
   - o Release status, type of material and estimated duration
   - o Message authentication of phone call
   - o Subzones recommended for protective actions
   - o Meteorological conditions
   - o Dose rates at site boundary
   - o Event prognosis, worsening or termination

6.3.4 Actions to protect the general public, and criteria for their implementation, are described in the State Plan. Protective action recommendations (PARs) are made to the County and State authorities.

1. ATTACHMENT E, EPA/KANSAS PROTECTIVE ACTION GUIDES, illustrates the EPA/Kansas PAGs for members of the public in the vicinity of WCGS and contains information typical of what may be used for the PAR guidelines. The ATTACHMENT provides guidelines and action levels to be used to develop protective action recommendations. Wolf Creek makes PARs for releases beyond the 10 mile EPZ. County and State officials have authority to take protective actions off-site.

2. Evacuation is the normally anticipated off-site protective action. Sheltering may be the preferred protective action when it will provide protection equal to or greater than evacuation. ATTACHMENT B, SUBZONE EVACUATION TIMES, contains evacuation times for the general and transient public.

(Step 6.3.4. continued on next page)

Step 6.3.4. (continued from previous page)

3. An Alert and Notification System (ANS) is used to alert the public to incidents at the nuclear power plant and notify them of actions to be taken.

6.3.5 Contact point for information concerning the County Plan, protective measures, and special needs of the handicapped is the County Emergency Management Office.

6.3.6 Additional resources available for accident assessment include accident monitoring and in-plant iodine instrumentation under accident conditions. Detailed discussions of these resources and their capabilities are found in the USAR.

6.3.7 The Emergency Dose Calculation Program (EDCP) is a computerized method to provide dose estimates using actual or estimated meteorological data (wind speed, wind direction, degree of cloud cover, day or night determination) and radiological effluent data (actual measurements, estimated values based upon SAP 98-154 and SAP 99-145 source terms, or field measurements). EDCP is designed to: (Reference Step 3.1.9)

1. Use radiological and meteorological information to provide an estimate of off-site exposure.

2. Be capable of estimating release rates and off-site exposures from off-site field team data.

3. Off-site dose predictions when combined with actual release duration information and meteorological data during an event, provide sufficient data to estimate the cumulative population dose resulting from the event. The actual off-site population dose is confirmed by off-site monitoring, sampling and analysis.

6.3.8 Radiological monitoring teams have a goal of 60 minutes from the declaration of Alert or greater emergency to be ready for deployment to confirm effluent readings and verify plume emission and locations.

o In accordance with EPP 06-011,EMERGENCY TEAM FORMATION AND CONTROL, joint radiological monitoring teams (JRMTs) are comprised of at least two people in any combination from Wolf Creek, Kansas Department of Health and Environment (KDHE), or Coffey County personnel.

6.3.9 FIGURE 7, WCGS EMERGENCY RESPONSE FACILITIES, provides a view of the off-site area, showing the location of the EOF. FIGURE 8, AIRBORNE PATHWAY SAMPLING LOCATIONS shows the fixed air sampling locations. FIGURE 9, DIRECT RADIATION PATHWAY SAMPLING LOCATIONS, shows the direct radiation pathway sampling dosimeter locations. FIGURE 10, WATERBORNE PATHWAY SAMPLING LOCATIONS, shows locations for collecting water samples.

6.3.10 At a Site Area Emergency, General Emergency, or when accountability is required, all personnel not responding to an Emergency Response Facility report to an assembly area for accountability and additional information. ERO personnel report to their assigned emergency facility. Security reports the results of accountability to the TSC.

6.3.11 **IF** the Exclusion Area is evacuated,
THEN Security shall direct an inspection of the lake and land area within the Exclusion Area but outside of the Protected Area to ensure that all personnel not responding to an Emergency Response Facility are evacuated from the Exclusion Area.

6.3.12 WCGS procedures contain decontamination instructions and guidelines. Methods for determining if the individual is a potential inhalation or ingestion contamination case are also provided. The Radiological Coordinator or appropriate Radiation Protection supervisory personnel will review the records generated by decontamination procedures.

1. Decontamination can be performed in the access control area of the Control Building, in the HVAC room of the TSC, and in the garage in the EOF.

2. Other decontamination areas are setup as designated by the Radiation Protection personnel on the ERO.

6.3.13 Respiratory protective devices and protective clothing are stored at several locations on-site and at the EOF. The use of protective clothing and respiratory protection equipment is governed by normal WCGS procedures.

6.3.14 A supply of potassium iodide (KI) is maintained at the Control Room, TSC and the EOF to be used in the event that an individual may be exposed to radioiodine.

6.3.15 There are suggested levels of exposure to be accepted in emergencies. Immediate reentry may be necessary to save a life, account for missing personnel, or secure vital equipment. The Emergency Managers are ultimately responsible for exposure control and can permit the receiving of up to 5 REM per person for work activities, 10 REM for saving valuable equipment and 25 REM for lifesaving after consulting with the NRC, if feasible. Exposure which might exceed 25 REM, for lifesaving activities, must be approved by an Emergency Manager. Although EPA and NRC do not provide specific guidance for the upper bounds for lifesaving exposure, WCGS has chosen to use the following criteria:

1. Emergency Managers shall not knowingly permit an individual's exposure to exceed 25 REM, unless it is for lifesaving activities or protection of large populations. Emergency Managers shall not knowingly permit an individual to enter a high dose area if the projected Total Effective Dose Equivalent (TEDE) is expected to exceed 75 REM.

   - Those individuals designated to exceed 25 REM must be volunteers and be fully aware of the risks involved.

2. Emergency Managers should obtain the advice and concurrence of the Radiological Coordinators in approving additional exposure.

6.3.16 Under emergency conditions, normal exposure controls are maintained. This is ensured by the on-shift Radiation Protection (RP) Technician in the Control Room, the Radiological Coordinators in the TSC and EOF.

6.3.17 The Radiological Coordinator has responsibility for maintaining exposure control for site activities, including establishment of access control at alternate locations. Strict exposure control of individuals passing through the access point is maintained on a 24-hour-per-day basis.

6.3.18 In order to enhance the exposure control process and to provide dosimetry for an expanded number of people, dosimetry vendors are available to expedite shipment of extra dosimetry devices to supplement existing on-site supplies of dosimetry equipment and to supply personnel to assist in on-site appraisal of exposures.

6.3.19 When activated, the Emergency Response Team covers emergency sampling, surveying, analysis, and hazard evaluation.

6.3.20 Personnel, instruments, and equipment are to be monitored at the access control point. Personnel and equipment decontamination is controlled in accordance with WCGS procedures.

6.3.21 WCGS maintains control over the Exclusion Area as necessary, restoring affected on-site areas to acceptable conditions for access.

1. Reentry into affected areas is a controlled evolution. Surveys are performed, environmental samples are obtained and analyzed, and areas posted or decontaminated.

6.3.22 Contamination limits for food supplies and drinking water are based upon the State of Kansas Protective Action Guides.

6.4 Emergency Facilities

6.4.1 Control Room Facilities

1. The Control Room is designed to be habitable under emergency conditions. The Control Room contains controls, instruments, and communications equipment necessary for operation of the plant under both normal and emergency conditions. The ventilation system, shielding, and structures are designed and built to permit continuous occupancy during a postulated design basis accident.

2. Equipment available in the Control Room gives early warning and continuous evaluation of potential emergency situations. Portable radiation survey instruments are readily available within the Control Room.

3. Access to the Control Room is controlled by the Shift Manager.

6.4.2 Technical Support Center Facilities

1. The TSC is a brisk 2 minutes and 15 seconds walk from the Control Room inside the Protected Area. This is sufficiently close to permit face-to-face interaction between personnel in the Control Room and the TSC, should telephone communications become inoperable.

2. The TSC is activated in the event of an Alert or higher emergency. The TSC may be activated during an NUE at the discretion of the Shift Manager.

3. The TSC is designed to the seismic criteria of the Uniform Building Code. It is designed to withstand 100-year-recurrence winds and is located above the probable maximum flood level.

   a. The manually activated single-train, non-seismic Category I TSC ventilation system utilizes high-efficiency particulate air and charcoal filters. The radioiodine monitoring equipment in the TSC provides a designed minimum detectable level of 1.0E-07 uCi/cc radioiodine. A radiation monitor (including the monitor for radioiodines) alarms to alert TSC personnel if radiation levels may affect the habitability of the TSC.

(Step 6.4.2.3. continued on next page)

Step 6.4.2.3. (continued from previous page)

b. Portable radiation monitoring equipment is provided in the TSC for backup radiation monitoring capability.

c. Equipment for Emergency Response Teams is available in the TSC. This equipment includes protective clothing, dosimetry, survey meters and respirators.

d. A diesel generator is available to provide backup power to the TSC. Until the diesel is loaded, batteries are available for Nuclear Plant Information System (NPIS).

e. The TSC is sized to accommodate a minimum of 25 persons and has the same radiological habitability as the Control Room under accident conditions.

4. Personnel in the TSC have access to the following materials:

   o WCGS USAR, Environmental Report, and Technical Specifications

   o Plant operating and emergency procedures

   o WCGS, State, and Coffey County emergency response plans

   o System drawings, schematics, and diagrams

5. An Alternate TSC is located at the EOF. The Alternate TSC would be used in the case of a hostile action or other event impeding site access. The Alternate TSC provides access to the same materials as the primary TSC. The Alternate TSC has the capability to:

   o Communicate with the EOF, Control Room and Security personnel

   o Perform off-site notifications of a plant emergency

   o Perform engineering assessment activities, including damage control team planning and preparation

6.4.3 Operations Support Center

1. The OSC is housed in the TSC and is activated whenever the TSC is activated.

2. The OSC serves as an assembly area for plant personnel immediately serving in emergency repair or Radiation Protection support capacity during an event. The OSC functions include the coordination, formation and dispatch of Emergency Response Teams.

3. The basement of the Security Building has been identified as an alternate location for the OSC function. It contains telephones and a Gai-Tronic call box, which will allow direct communications with the other emergency centers. Portable radios are available to key personnel to further provide communications with other emergency centers.

4. An alternative OSC muster area is included with the Alternate TSC at the EOF. The Alternative OSC muster area would be used in conjunction with the Alternate TSC.

6.4.4 Emergency Operations Facility (EOF)

1. The EOF is located approximately 12 miles north northwest of WCGS, near the junction of I-35 and US-75, and is activated at an Alert or higher emergency. Following facility activation, overall emergency response is managed from the EOF.

   a. This facility serves as a center for evaluation and coordination of environmental activities related to the emergency including radiological assessment and the evaluation of potential or actual radioactive releases from the plant.

2. The EOF is a commercial building that is well engineered for the design life of the plant.

   a. A diesel generator is available to provide backup power to the EOF. Until the diesel is loaded, UPS backup is available for equipment used to access plant data upon loss of AC power.

   b. The EOF is sized to accommodate at least 35 persons.

(Step 6.4.4. continued on next page)

Step 6.4.4. (continued from previous page)

3. Accommodations and telephones are provided for a limited number of County, State and Federal personnel. Facilities are provided for staging field survey efforts from the EOF.

4. The EOF serves as the base of operations for evacuation assessments and for communications with federal, state, and local response organizations. Radio and telephone links are available to the TSC, and Control Room.

5. Personnel in the EOF have access to the following materials:

   o WCGS USAR, Environmental Report, and Technical Specifications

   o Plant operating and emergency procedures

   o WCGS, State, and Coffey County emergency response plans

   o System drawings, schematics, and diagrams

6.4.5 Public Information Facilities

1. The Public Information Facilities include the Joint Information Clearinghouse (JIC), Media Center (MC), and Public Inquiry Room. These facilities may be established as follows:

   a. The JIC and Public Inquiry Room in the Wolf Creek Joint Media Center, at 2718 Lynx Place, Lebo, KS.

   b. The MC in the Wolf Creek Joint Media Center, at 2718 Lynx Place, Lebo, KS.

2. At an NUE, information is provided to the public by Corporate Communications. The Wolf Creek Public Information Facilities may be staffed at any time, as determined by the Wolf Creek Public Information Officer, to support the distribution of information to the public.

3. The Public Information Organization activates at an Alert or higher emergency.

(Step 6.4.5. continued on next page)

Step 6.4.5. (continued from previous page)

4. The JIC, MC, and the Public Inquiry Room are kept in close proximity to each other to facilitate coordination of information in the form of news statements, news conferences or telephone conversations.

   a. Dedicated telephone lines allow contact between the JIC, TSC, and the EOF. The JIC contains status boards, appropriate office supplies, computer(s), printer(s), faxing and photocopy capabilities, and outside telephone lines.

5. The Wolf Creek PIO, the State PIO and Coffey County PIO communicate with the Public Information Coordinator (PIC) to obtain technical information. The PIOs prepare news statements at the JIC and coordinate their efforts.

6. The MC will accommodate media representatives in an auditorium for news conferences. The Media Room is a facility set up to provide the media with a work area, audio/visual material, outside telephone lines and public information status boards.

7. Media Monitoring and Rumor Control functions for WCGS, the State and Coffey County are performed by members of the Public Information Organization in the Public Inquiry Room. Appropriate equipment and supplies are available. Approved news statements and information are transmitted to the Public Inquiry Room after the JIC is activated.

   a. The Media Monitoring Team reports any rumors or misinformation heard or observed from their monitoring of the media to the JIC.

6.4.6 <u>On-Site Medical Facility</u>

1. A medical facility is located in the Clyde Cessna building. This facility is equipped to provide basic medical response capabilities.

2. First aid kits, emergency equipment and supplies are available to ensure that assistance can be provided to injured and/or contaminated personnel.

(Step 6.4.6. continued on next page)

Step 6.4.6. (continued from previous page)

3. Shift personnel, trained in first aid, are available on-site 24 hours per day. Priority should be given to treating those with the most urgent medical needs.

4. In the case of contamination, efforts are made to decontaminate injured personnel on-site, as soon as practicable. However, first aid or removal of the individual from a hazardous environment, takes precedence over decontamination efforts. If decontamination is not possible, the victim is covered in such a manner as to avoid any spread of contamination until medical aid can be obtained or hospitalization accomplished.

5. Personnel leaving the RCA are monitored for contamination. All personnel are monitored for contamination before leaving the site.

   a. Personnel may be monitored by portal monitors or friskers when entering or leaving WCGS facilities.

   b. Personnel found to be contaminated must undergo decontamination under the direction of Health Physics personnel using Health Physics supplies and equipment available during routine activities. Release limits for personnel decontamination are found in the Health Physics Manual.

6.4.7 <u>State and County Facilities</u>

1. Coffey County Emergency Operations Center (County EOC) is located in the Coffey County Courthouse, Burlington, KS. The County EOC is a command center for county agencies and a mustering area for personnel who arrive in the WCGS area in response to an emergency. The County EOC is activated at the Alert level with the additional support staff activated upon declaration of an SAE or GE. Other centers are established as the emergency needs dictate.

2. State of Kansas Emergency Operations Center (State EOC) located in the State Defense Building, Topeka, KS, is the command-and-control center for the State.

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Step 6.4.7. (continued from previous page)

3. The State Forward Staging Area is located about 11 miles north of WCGS in the roadside park at the intersection of Old Highway 50 and U.S. 75. When it becomes necessary for the State to dispatch emergency personnel to the plume exposure pathway emergency planning zone (EPZ), the State activates the State Forward Staging Area to serve as a secondary base of operations for state personnel and a local contact point with Coffey County.

6.4.8 Evacuation Registration Center

1. People in the EPZ should evacuate to

* the Lyon County Reception Center located at Neosho Rapids Grade School, 240 N. Commercial St., Neosho Rapids, Kans. Travel north on US Hwy. 75 to I-35. Turn left (West) toward Emporia onto I-35 South. Take exit 141 for KS-130 toward Neosho Rapids/Hartford, travel two and one-half miles to the Neosho Rapids Grade School.

OR

* the Woodson County Reception Center, located at the Woodson County Rural Fire Station, 801 West Mary St., Yates Center, Kans. Travel south on US Hwy.75 to Yates Center. At the intersection of Hwy. 75 and W. Washington Street, turn right (west). Travel approximately two blocks to the Woodson County Rural Fire Station.

6.5 Control Room Organization

6.5.1 The Shift Manager is responsible for the initial evaluation and classification of any abnormal situation and for directing the appropriate response, including initial activation of a callout.

1. Control Room personnel are on shift 24 hours a day. The shift complement is shown in Figure 2, MINIMUM SHIFT STAFFING.

6.5.2 Upon declaration of an emergency, the Shift Manager assumes the duties of Emergency Manager. The Shift Manager normally goes to and remains in the Control Room unless it is necessary for him to leave the Control Room in order to perform specific assessment, corrective, or protective actions. The Shift Manager performs the following actions:

- o Initiate appropriate technical measures to mitigate the event
- o Determine if releases have occurred, make the necessary assessment of the off-site concentration of radioactivity resulting from a release, and evacuate non-essential personnel if necessary
- o Direct the activities of the Control Room Emergency Notification System (ENS)/Off-site Communicator
- o Ensure immediate and follow-up notifications are made which provide sufficient information on emergency classification, plant status, off-site dose projections or measurements, and issue recommendations for off-site protective actions to authorities responsible for off-site emergency measures
- o Ensure NRC Resident Inspector is notified as soon as possible after the State and County are notified
- o Ensure notifications to the NRC are made as soon as possible within 60 minutes of classification of an emergency in accordance with 10CFR50.72(a)(3)
- o Ensure other notifications are made in accordance with EPPs
- o Activate on-site emergency teams if required
- o Notify plant personnel of the change in plant status

6.5.3 ENS/Off-Site Communicator

1. ENS/Off-site Communicator reports to the Shift Manager, performs initial notifications, initiates the Automatic Dialing System (ADS) or Backup ADS to callout the ERO and maintains communications with the NRC.

   a. A manual callout of personnel to staff the ERO is performed if the ADS and Backup ADS are not functioning.

6.5.4 Chemistry Technician

1. The Chemistry Technician reports to the Shift Manager and performs dose assessment until relieved by Dose Assessment personnel in the EOF.

6.5.5 Radiation Protection (RP) Technician

1. The RP Technician reports to the Shift Manager and performs radiation monitoring for personnel sent from and in the Control Room.

6.5.6 Control Room Supervisor

1. Reports to the Shift Manager and provides direction to Reactor Operators and Nuclear Station Operators for the safe operation of the unit.

6.5.7 Reactor Operators

1. The Reactor Operators report to the Control Room Supervisor and perform plant monitoring and reactor manipulations as needed from the Control Room.

6.5.8 Nuclear Station Operators

1. Nuclear Station Operators report to the Control Room Supervisor and perform local plant monitoring and manipulations as directed.

~~6.5.9 Shift Technical Advisor (STA)~~

~~1. The Shift Technical Advisor reports to the Shift Manager and performs STA requirements as assigned by the NRC.~~

~~6.5.10~~6.5.9 Initial emergency response to the major functional areas is within the capabilities of the minimum operations shift complement.

~~6.5.11~~6.5.10 On-shift staff augmentation is available, when deemed necessary, in accordance with ATTACHMENT D, WCGS MINIMUM STAFFING FOR EMERGENCIES.

6.6 Technical Support Center (TSC) Organization

6.6.1 TSC activation will be performed as soon as practical and within 75 minutes of a declaration of an Alert or higher classification.

6.6.2 The TSC is considered activated when the following positions are present, the Site Emergency Manager determines the facility is ready to activate, and declares the facility activated:

- o Site Emergency Manager
- o TSC Operations Coordinator
- o TSC Administrative Coordinator
- o TSC Radiological Coordinator
- o Maintenance Coordinator

6.6.3 The TSC organization is shown in FIGURE 3, TSC/OSC ORGANIZATION.

6.6.4 Additional personnel to support repair efforts and recovery functions will be added as necessary. Personnel reporting from off-site may initially report to the EOF/Alternate TSC, and then proceed to the TSC as plant/site conditions allow.

6.6.5 Site Emergency Manager

1. The assigned Site Emergency Manager will assume command-and-control functions and will be the top line manager responsible for the emergency. An assigned Site Emergency Manager is available 24 hours a day. The assigned Site Emergency Manager may assume command-and-control functions from the Shift Manager during an NUE if so requested by the Shift Manager.

2. The Shift Manager will transfer the Site Emergency Manager duties to the assigned Site Emergency Manager in accordance with EPPs. The Shift Manager resumes Control Room duties and reports to the Site Emergency Manager.

(Step 6.6.5. continued on next page)

Step 6.6.5. (continued from previous page)

3. The Site Emergency Manager directs the on-site emergency effort, implements the applicable EPPs and, as appropriate, performs the following:

   - o Assess and verify the situation and assure that appropriate mitigating efforts are being taken
   - o Review initial event classification and reclassify as appropriate
   - o Determine the necessity for evacuation of personnel on-site
   - o **IF** a release has occurred, **THEN** make the necessary assessment of the off-site concentration of radioactivity resulting from a release
   - o Ensure immediate and follow-up notifications are made which provide sufficient information on emergency classification, plant status, off-site dose projections or measurements, and issue recommendations for off-site protective actions to authorities responsible for off-site emergency measures

4. The following responsibilities are those of the Emergency Managers and may not be delegated. These responsibilities may be divided between the Site and Off-Site Emergency Managers:

   - o Classification of the emergency
   - o Protective action recommendations
   - o Authorization for notification of off-site authorities
   - o Authorization for emergency exposure in excess of 10 CFR 20 limits

6.6.6 TSC Operations Coordinator

1. The TSC Operations Coordinator reports to the Site Emergency Manager and is responsible for the following:

   o Supervise reactor plant operations, which includes the Operations Recorder, Engineering Coordinator, Engineering Team and ENS Communicator.

   o Keep the Site Emergency Manager advised of plant conditions and operational manipulations.

2. The TSC Operations Coordinator may supervise other positions as directed by WCGS procedures.

6.6.7 Engineering Coordinator

1. The Engineering Coordinator reports to the TSC Operations Coordinator and directs the activities of the Engineering Team to technically assess plant status and the severity of emergency conditions.

6.6.8 Engineering Team

1. The Engineering Team reports to the Engineering Coordinator. The Team evaluates current and historical plant parameters, assesses the severity of the emergency conditions and magnitude of fuel damage, and recommends corrective or preventive actions.

6.6.9 TSC Emergency Notification System (ENS) Communicator

1. The TSC ENS Communicator reports to the TSC Operations Coordinator and maintains communications with the NRC.

6.6.10 TSC Radiological Coordinator

1. The TSC Radiological Coordinator reports to the Site Emergency Manager and is responsible for preventing or minimizing direct exposure to, or ingestion/inhalation of, radioactive materials during a radiological emergency. Responsibilities are as follows:

   o Monitoring dose rates and dose projections

   o Monitoring radiological survey teams' results

   o Assists the Site Emergency Manager in the formulation of recommended protective actions

   o Monitoring personnel radiation exposures to ensure they are maintained in accordance with 10CFR 20 limits unless otherwise authorized by the Emergency Manager

   o Provides radiological data and concerns to plant teams for the team briefs

   o Authorizing and supervising Off-site Monitoring Teams until the EOF is staffed

2. The TSC Radiological Coordinator will transfer off-site duties to the EOF when the EOF is activated

6.6.11 TSC Administrative Coordinator

1. The TSC Administrative Coordinator reports to and assists the Site Emergency Manager to ensure that emergency notifications are performed. The TSC Administrative Coordinator is responsible for logistical support in the areas of TSC personnel, Control Room, procurement and warehouse support, communications support and equipment repair services.

2. After EOF activation, the TSC Administrative Coordinator directs requests for logistical support beyond on-site staff capabilities to the EOF Administrative Coordinator.

6.6.12 TSC Team Director

1. The TSC Team Director reports to the TSC Maintenance Coordinator and provides advice on all matters concerning Emergency Response Team activities.

6.6.13 Maintenance Coordinator

1. The Maintenance Coordinator reports to the Site Emergency Manager and directs the Maintenance Assistant in the coordination of emergency team activities. The Maintenance Coordinator also directs the formation of teams to be assigned to search and rescue.

6.6.14 Operations Communicator

1. Provides data, progress and plant conditions from the Control Room via the Operations Recorders.

6.6.15 Additional Personnel

1. The following are examples of positions that are not needed for activation and operation of the TSC but supplement those personnel which are essential to an emergency response:

   - Operations Recorder maintains the Operations Status Board current.

   - Team Communicator reports to the Team Director and is responsible for communicating with On-site Teams.

   - Emergency Response Team Members perform tasks as assigned by the Maintenance Assistant.

   - Administrative Assistants perform facility accountability, assist the Emergency Manager, faxing and copying, log keeping, and communications as directed.

   - Security Coordinator maintains a line of communications between the TSC and Security to cover security concerns.

6.7 Operations Support Center (OSC) Organization

6.7.1 Maintenance Assistant

1. The Maintenance Assistant reports to the Maintenance Coordinator and coordinates emergency repair and damage control activities, coordinates deployment of on-site teams, and coordinates the activities of the Maintenance Planners.

6.7.2 Emergency Response Team (ERT)

1. The ERT personnel may be selected from Radiation Protection Technicians, Chemistry Technicians, and Instrumentation and Control, Mechanical, or Electrical Maintenance. The ERT reports to the Maintenance Assistant and is responsible for repairs, surveys, sampling, analysis, and search and rescue.

6.7.3 Additional Personnel

1. The following are examples of positions that are not needed for activation and operation of the OSC but supplement those personnel which are essential to an emergency response.

   - Chemistry Technicians perform emergency chemical sampling and provide post-accident sample analysis.

   - The Maintenance Planner develops repair plans for use by the emergency repair and damage control teams and assists in locating and securing parts and equipment from the warehouse.

6.8 Emergency Operations Facility (EOF) Organization

6.8.1 EOF activation will be performed as soon as practical and within a goal of 90 minutes of a declaration of an Alert or higher Emergency.

1. The EOF is considered activated when the following positions are present, the Off-site Emergency Manager determines facility readiness, and declares the facility activated:

   - Off-Site Emergency Manager

   - EOF Operations Coordinator

   - EOF Administrative Coordinator

   - EOF Radiological Coordinator

2. The complete EOF organization is shown in FIGURE 4, EOF ORGANIZATION.

6.8.2 Off-Site Emergency Manager

1. The Off-Site Emergency Manager will assume the command-and-control functions and direct the emergency from EOF. An assigned Off-Site Emergency Manager is available 24 hours a day.

2. The Off-Site Emergency Manager is the official WCGS interface with government authorities. The Manager may discuss events in progress with the County and State personnel present in the EOF when making decisions concerning the emergency. Responsibilities include the following:

   a. Supports and provides resources or performs tasks as requested by the Site Emergency Manager

   b. Directs all WCGS personnel in the EOF

   c. Obtains personnel and coordinates the efforts of the following:

      o Emergency response personnel who perform off-site radiological surveys, plus any other personnel deemed useful for the emergency response effort

      o Outside contractors and vendors, such as consultants, laboratories under contract, the Nuclear Steam Supply System (NSSS) vendor, the Architect/Engineer, and regional utilities

      o Additional technical resources may be called in during the emergency for further support or shift assignment on-site.

   d. Coordinates with the Administrative Coordinator in the logistics effort to supply the plant with the necessary personnel and equipment

   e. Briefs WCGS Executive Management on matters related to the emergency

   f. Coordinates with the Off-Site Public Information Coordinator (PIC) in providing technical input for news statements

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g. Ensure immediate and follow-up notifications are made which provide sufficient information on emergency classification, plant status, off-site dose projections or measurements, and issue protective actions recommendations to off-site authorities responsible for off-site emergency measures

h. Requests federal assistance through state officials per the State Plan

3. The following responsibilities are those of the Emergency Managers and may not be delegated. These responsibilities may be divided between the Site and Off-Site Emergency Managers:

- o Emergency classification
- o Protective action recommendations
- o Authorization for notification of off-site authorities
- o Authorization of emergency exposure in excess of 10CFR 20

6.8.3 <u>EOF Radiological Coordinator</u>

1. The EOF Radiological Coordinator reports to the Off-Site Emergency Manager and is responsible for radiological monitoring and dose assessment activities off-site. Responsibilities are as follows:

- o Directs and coordinates activities of the Dose Assessment Coordinator and staff
- o Assists the Off-Site Emergency Manager in the formulation of recommended protective actions
- o Provides the PIC with an assessment of radiological conditions
- o Requests through the EOF Administrative Coordinator additional radiation monitoring equipment, instrumentation and Radiation Protection support personnel as necessary
- o Interfaces with State and County emergency response personnel who are assigned to the EOF regarding matters related to off-site radiological assessment

6.8.4 EOF Team Director

1. The EOF Team Director assumes responsibility for authorizing and supervising Off-Site Monitoring Teams. The EOF Team Director directs Emergency Response Teams and advises the EOF Radiological Coordinator on radiological conditions encountered by the Teams.

   a. Off-Site Monitoring Team authorization should be made promptly upon activation of the EOF.

   b. Monitoring teams are specially trained in field sampling techniques. Each team will be equipped with equipment capable of detecting and measuring radioiodine concentrations in the air at levels as low as 10-7 uCi/cc.

   c. County and State personnel may become part of the ERTs to form joint teams to perform off-site monitoring under the direction of a unified team control in accordance with EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL.

6.8.5 Dose Assessment Coordinator

1. Reports to the EOF Radiological Coordinator and is responsible for providing completed off-site dose projections and protective action recommendations.

2. Ensures the Radiological Status Board is maintained current.

6.8.6 HPN Communicator

1. The HPN Communicator reports to the EOF Radiological Coordinator and maintains communications with the NRC via the Health Physics Network (HPN) telephone.

6.8.7 EOF Operations Coordinator

1. Reports to and briefs the Emergency Manager on plant conditions and mitigative strategies.

6.8.8 EOF Administrative Coordinator

1. The Administrative Coordinator is responsible for coordinating, directing, and responding to requests from the ERO for administrative and logistical support. The techniques and procedures used during this effort are adapted from normal WCGS procurement practices. The Administrative Coordinator also ensures notifications to off-site authorities are made.

6.8.9 Representative At County

1. The Representative at the County is located in the County Emergency Operations Center in Burlington, KS, and reports to the Off-Site Emergency Manager. The Representative responds to requests from County personnel for clarification or verification of data received from the TSC or EOF.

6.8.10 Additional Personnel

1. The following are examples of positions that are not needed for activation and operation of the EOF but supplement those personnel which are essential to an emergency response.

   - Assistant Radiological Coordinator assists the Radiological Coordinator and interacts with KDHE staff to ensure necessary information is available

   - Team Communicator communicates with Off-Site Monitoring Teams

   - Operations Recorder maintains the Operations Status Board current

   - Administrative Assistants assist the Emergency Manager, perform faxing and copying, log keeping, and Off-site notifications and communications as directed

6.9 Public Information Organization

6.9.1 The Public Information Organization is activated at an Alert or higher emergency declaration. Information released to the public during an NUE will be provided by Corporate Communications. If deemed necessary, the Wolf Creek Joint Media Center facilities may be staffed to assist in releasing news statements during an NUE.

6.9.2 Wolf Creek Public Information Officer (WC PIO)

1. The WC PIO is the public voice for plant information. The WC PIO is responsible for ensuring the timely issuance of accurate information to the public and media during an emergency at WCGS. Public interaction may be as a formal news conference or a telephone call.

   a. The WC PIO coordinates with the County and State for information to be released to the public.

2. The WC PIO has overall responsibility for the Public Information Organization.

6.9.3 Wolf Creek Public Information Manager (WC PIM)

1. The WC PIM is located in the JIC and reports to the WC PIO. The WC PIM works closely with the WC PIO, Off-Site PIC, News Writer, and Technical Support positions to ensure that information provided the public is timely and accurate.

2. The WC PIM has responsibility for ensuring the Public Information Organization is activated and functions as directed in EPPs.

3. During a declared emergency the WC PIM determines and coordinates the activation of the Joint Information Clearinghouse, Media Center, and Public Inquiry Room. The WC PIM operates from the Wolf Creek Joint Media Center JIC.

4. The complete Public Information organization is shown in FIGURE 5, PUBLIC INFORMATION ORGANIZATION.

6.9.4 Off-Site Public Information Coordinator (PIC)

1. The Off-Site PIC is located in the EOF and reports to the WC PIM. The Off-site PIC gathers and transmits information related to the health and safety of the public to the Joint Information Clearinghouse for use in news statements.

6.9.5 Media Center Manager (MC Manager)

1. The MC Manager is located at the Media Center and reports to the WC PIM. Responsibilities include set-up of the Media Center, leadership for the Media Registrar, AV Support, and management of the media news conferences.

2. Responsibilities include managing the media crowd at the Media Center and assisting with media registration and facility orientation, providing general Wolf Creek background information or approved emergency-related information, arranging individual interviews, and announcing and coordinating scheduled news conferences.

3. The Media Center Manager maintains contact with the Joint Information Clearinghouse to provide news conference schedules.

6.9.6 News Writer

1. The News Writer reports to and provides support for the WC PIM. The News Writer provides support to the PIO including: answering telephones, writing and distributing news statements. The News Writer maintains a chronological log of the events and news statements.

6.9.7 Phone Team Manager

1. The Phone Team Manager reports to the WC PIM and coordinates the rumor control activities of the Phone Team.

6.9.8 Technical Support

1. Technical Support discusses technical details of the news statement with EOF staff to ensure accuracy, updates the status log, maintains the media status board and provides technical interpretation for the Wolf Creek, Coffey County, and State of Kansas Public Information Officers. Technical Support gathers information from the Emergency Facilities to communicate plant, health and safety issues to the public.

6.9.9 Representative at the State

1. The Representative at the State is located in the State of Kansas Emergency Operations Center in Topeka, KS, and reports to the WC PIO. The Representative responds to requests from State personnel for clarification or verification of information pertaining to Wolf Creek.

6.9.10 Additional Personnel

1. The following are examples of additional personnel used to fill ERO positions such as clerical, log keeping, or status board posting. Staffing of these positions does not affect the activation of the facility.

   - Media Center Registrar monitors access to the Media Center, records news conference attendance, provides media packets, provides directions for telephone use and work space information to the media representatives.

   - Audio/Visual Support records news conferences presented in the Media Center.

   - Information Messenger performs clerical and administrative duties at the direction of the Public Information Manager.

   - The Phone Team may make initial media notifications at PIO discretion, addresses media and public questions to the extent possible and reports rumors or misinformation to the Phone Team Manager.

   - The Media Monitoring Team notifies the Phone Team Manager of any rumors or misinformation heard or observed from their monitoring of the media.

6.10 Local Off-Site Organizations

6.10.1 The Coffey County Contingency Plan for Incidents Involving Commercial Nuclear Power describes the authorities, responsibilities, and agreements to which various county agencies are a party in their response to emergencies at WCGS. Information is provided therein about the various agencies' interrelationships and support roles provided to WCGS.

- o The updated evacuation time estimate (ETE) report contains the evacuation times for each subzone. (Reference 3.1.12)

6.10.2 Coffey County Commissioners

1. The Coffey County Board of Commissioners maintains the executive authority and responsibility for planning and coordinating the county response. They have delegated responsibilities and tasks to the local support agencies and have established operating procedures.

2. After declaring a State of Local Disaster Emergency, the Chairman of the Coffey County Commissioners is responsible for making the decision to activate the alert and notification system. Emergency authority, as stated in County Plan, is given in an established line of succession.

3. If a State of Local Disaster Emergency has not been declared, after receipt of notification and in accordance with the County Plan, the Chairman decides which protective actions would be appropriate.

   - o When a protective action decision is made, the County will activate the alert and notification system.

6.10.3 Coffey County Sheriff's Office

1. The Coffey County Sheriff's Office provides local notification, access control, and law enforcement support in accordance with the Coffey County Plan.

(Step 6.10.3. continued on next page)

Step 6.10.3. (continued from previous page)

2. If time does not permit, or if he/she is unable to contact the Chairman or other members of the County Emergency Response Organization, the County Sheriff has the authority to make protective action decisions based upon recommendations by WCGS.

3. Specific services provided by the Coffey County Sheriff's Office include:

   - o Perform notifications as defined within the County Plan and associated implementing procedures
   - o Provide a 24 hour per day manning of communications links between the County and WCGS, and between the County and State
   - o Implement off-site protective actions as necessary and as specified in the County Plan implementing procedures
   - o Initiate warning and initial notification of the population
   - o Direct the evacuation of specific subzones of the EPZ upon the decision to evacuate
   - o Provide traffic control and roadblocks per implementing procedures
   - o Obtain additional assistance as necessary to secure the evacuated areas
   - o Control access to the County EOC

6.10.4 <u>Coffey County Fire District #1 (CCFD)</u>

1. Contractual arrangements have been made with the Board of Trustees of Fire District No. 1, Coffey County, KS, for the provision of fire fighting support. Services contracted are summarized in the Letter of Agreement and maintained in an Emergency Planning file.

2. The WCGS Fire Brigade Leader is also responsible for directing all fire fighting activities on site. Once on site, Fire District members and equipment shall be escorted by Security.

6.10.5 Off-Site Medical Treatment

1. Coffey County Hospital and Newman Regional Health have emergency procedures to provide guidance in the rendering of medical treatment to contaminated patients.

2. Coffey County Hospital, located in Burlington, KS, approximately 9 road miles from the WCGS site, has agreed to provide aid to personnel who are injured or ill and also potentially contaminated.

3. Newman Regional Health serves as a backup to Coffey County Hospital and is located in Emporia, KS, approximately 40 miles from WCGS.

4. Contaminated injured or ill personnel transported from WCGS to off-site medical facilities are attended by personnel trained in radiological practices. Once the patient(s) has been stabilized, WCGS personnel survey patient(s), attending personnel, vehicles, and equipment to ensure they have been decontaminated in accordance with WCGS, County, or State procedures.

6.10.6 Coffey County Emergency Medical Service (EMS)

1. Coffey County EMS provides response, treatment and transportation for personnel who are injured or ill and also potentially contaminated. This assistance is requested by calling 911.

2. If conditions warrant, any vehicle at WCGS may be used to transport affected personnel.

6.10.7 Radiological Emergency Assistance Center/Training Site (REAC/TS)

1. REAC/TS maintains a 24 hour Hospital Disaster Network. Consultation is available for medical emergencies involving radiologically contaminated patients.

6.11 State Organizations

6.11.1 The Governor, by law, is the Chief Executive Officer of the State of Kansas and is responsible for the safety and well-being of all citizens within the State. The State Plan describes the responsibilities of local, federal, state, and volunteer agencies during nuclear emergencies. Upon declaration of a State of Disaster Emergency the State has primary responsibility for responding to an off-site nuclear emergency. Activation of the State EOC, located in the lower level of the State Defense Building, Topeka, KS, is the responsibility of the Governor or authorized representatives, depending on the nature of the emergency. The Kansas Division of Emergency Management provides overall coordination as the responding state agency during a Fixed Nuclear Facilities Incident.

6.11.2 The State of Kansas Radiological Emergency Response Plan for Nuclear Facilities describes in detail, the authorities, responsibilities, and agreements to which various state agencies of their response to emergencies at WCGS. Reference to this document is made for detailed information on each agency's interrelation and support role provided to WCGS.

1. Upon declaration of an SAE or GE representatives of Kansas Division of Emergency Management (KDEM) and Kansas Department of Health and Environment (KDHE) go to the EOF. They act as the interface between WCGS, the County, and the State.

6.11.3 Kansas Division of Emergency Management (KDEM)

1. The KDEM provides the following assistance:

   a. Evaluates information presented by WCGS to decide off-site protective actions

   b. Coordinates nuclear incident response planning, training, and notification. Activities include:

      - Notification of KDHE
      - Notification of Key federal and state agencies
      - Notification of the Governor's Office
      - Provides radiological monitoring coordination
      - Requests federal assistance and coordinates federal and state support on behalf of affected areas
      - Provides 24 hour per day point of contact to receive notification
      - Activates the State EOC

6.11.4 Kansas Department of Health and Environment (KDHE)

1. The KDHE provides assistance as described below:

   - o Acts as the lead state agency for radiological emergency response
   - o Conducts radiological monitoring in affected areas
   - o Provides radiological advice to hospitals
   - o Develops State PAGs
   - o Provides information to the public about protective actions, via KDEM
   - o Determines off-site contamination levels of the environment
   - o Provides technical guidance and coordination in recovery activities
   - o Supports the development and conduct of radiological response training
   - o Reviews, evaluates, and maintains dosimetry records for non-licensee emergency workers and other affected individuals

6.11.5 Kansas Highway Patrol (KHP)

1. The KHP provides communications and notification support including backup notification means for the following:

   - o Coffey County Sheriff's Office
   - o KDEM, Technological Hazards Section
   - o The Governor's Office

2. The KHP augments local law enforcement in securing the area and establishing evacuation routes and providing traffic control.

3. The KHP provides self-support radiological monitoring.

4. The KHP maintains emergency communications systems 24 hours per day.

6.11.6 Kansas National Guard

1. The Kansas National Guard may be directed by the Governor to provide assistance as needed such as the following:

   - o Evacuation of communities
   - o Area security
   - o Media Center Security

6.11.7 Kansas Department of Transportation (KDOT)

1. KDOT provides assistance as follows:

   - o Provides emergency traffic barriers and signs
   - o Supplements emergency traffic control
   - o Supplies construction equipment
   - o Provides communications support

6.12 Federal Organizations

6.12.1 Should an emergency situation or accident occur at WCGS, notification and reports must be made to various federal agencies and organizations, and requests for assistance may also be made.

6.12.2 Federal Emergency Management Agency (FEMA)

1. FEMA is the lead agency supporting implementation of the state and local emergency plans. Region VII FEMA response time is estimated to be four hours.

6.12.3 Department of Energy (DOE)

1. The DOE Radiological Assistance Program provides monitoring assistance and radiological consultation to the KDHE. The DOE provides assistance under the Nuclear/Radiological Incident Annex to the National Response Framework and responds to authorized requests for assistance by the KDHE. It is expected that initial responders, to assist with off-site radiological monitoring, will arrive within 8 hours.

6.12.4 Nuclear Regulatory Commission (NRC)

1. The NRC provides advice to other federal, state, and local agencies on the radiological health consequences of various emergency protective actions. The NRC requires notification and reports as indicated in ATTACHMENT H, REPORTING OF INCIDENTS PER 10CFR20 and as specified in the WCGS Technical Specifications. NRC Region IV response time is estimated to be 12 hours.

6.12.5 Licensee resources available to support the federal response include the following:

- Space and equipment in the TSC and EOF provided for key federal personnel
- Telecommunications equipment at these centers is available to federal personnel for use
- Parking space adjacent to the EOF provides an area for the location of federal response vehicles, with power and sanitary services available at the EOF
- Open fields west of the parking lot at the EOF provide access for helicopters
- Coffey County Airport is available for air traffic

6.12.6 Federal Radiological Monitoring and Assessment Center (FRMAC)

1. FRMAC is a federal asset available on request by the Department of Homeland Security (DHS) and state and local agencies to respond to a nuclear or radiological incident. The FRMAC is an interagency organization with representation from the NNSA, the Department of Defense (DOD), the Environmental Protection Agency (EPA), the Department of Health and Human Services (HHS), Federal Bureau of Investigations (FBI), and other federal agencies. Full Federal response (FRMAC) is expected within 48 hours.

6.13 Additional Support Agencies

6.13.1 Vendor and Architect/Engineers (A/E)

1. NSSS supplier, Westinghouse, is the chief vendor who may be involved with emergency response for WCGS. Westinghouse has emergency response plans which are activated upon notice and is expected to provide the following services:

   - o Personnel with expertise in various areas
   - o Technical analysis
   - o Operational analysis
   - o Accident/transient analysis
   - o Recommendations

6.13.2 Regional Utility Support

1. WCGS shares the Standardized Nuclear Unit Power Plant System (SNUPPS) power-block design with the Union Electric Callaway Plant. Because of this design concept and similarity with the WCGS layout, assistance from Union Electric is possible. A specific mutual aid agreement between WCGS and Callaway Energy Center, Ameren Missouri d/b/a Union Electric has been established. While this assistance may be available within a short period of time, it shows greatest promise in the case of a prolonged emergency where extended, around the clock coverage is required. The Site Emergency Manager may authorize the temporary use of this resource, should staff augmentation be necessary. Union Electric Company is a signatory of the INPO FIXED FACILITY EMERGENCY RESPONSE VOLUNTARY ASSISTANCE AGREEMENT.

6.13.3 Institute of Nuclear Power Operations (INPO)

1. WCGS has signed the INPO FIXED FACILITY EMERGENCY RESPONSE VOLUNTARY ASSISTANCE AGREEMENT. This agreement is by and among electric utilities which have responsibility for the construction and operation of commercial U.S. nuclear power plants. Assistance may be requested from any of the signatory companies in the form of technical and administrative aid or personnel, facility, or equipment resources. Requested assistance is rendered according to the agreement.

6.13.4 American Nuclear Insurers (ANI)

1. ANI is notified at emergency classifications of Alert or higher. ANI is available to provide insurance services as necessary.

6.14 Plant Monitoring

6.14.1 Nuclear Plant Information System (NPIS)

1. The integration and display of selected and critical data is performed by NPIS which is a non-safety, non-Class 1E system. Isolation is provided to ensure that NPIS does not degrade the performance of safety system equipment or displays.

2. NPIS provides data storage and recall capability.

3. Certain parameters are also transmitted to the NRC Operations Center via the Emergency Response Data System (ERDS) link of NPIS. ERDS is activated through NPIS within 60 minutes of an Alert or higher classification.

4. The NPIS computer feeds key plant parameters to individual terminals in the Control Room, TSC, and via *RTime Viewer to the EOF which display data identical in accuracy, resolution, and reliability. Support personnel may assist the Control Room staff to analyze and diagnose plant abnormalities so that mitigative action may be taken and then monitored.

(Step 6.14.1. continued on next page)

Step 6.14.1. (continued from previous page)

5. The Safety Parameter Display System (SPDS) provides for continuous indication of plant parameters or derived variables representative of the safety status of the plant. The primary function of the SPDS is to aid the user in the rapid detection of abnormal operating conditions. As a plant safety information and diagnostic tool, SPDS concentrates on a minimum set of plant parameters from which the plant safety status can be assessed.

6.14.2 On-Site Radiological Monitors

1. Process monitors monitor the radiation intensity of materials within plant systems. These monitors continuously measure, indicate and record the radioactive material concentrations located within systems being monitored. Each monitor includes an adjustable alarm to provide indication of a significant change or the existence of a concentration of radioactive material above pre-selected values. The USAR, Chapter 11.5, includes a listing and range of plant monitors.

2. The Area Radiation Monitoring System monitors provide information about radiation intensity at specific plant locations. These monitors provide the following:

   a. Warnings of excessive gamma radiation levels in areas where nuclear fuel is stored or handled

   b. Control Room personnel with a continuous indication of gamma radiation levels at selected locations within the various plant buildings

   c. Assistance in detecting unauthorized or inadvertent movement of radioactive material in the plant, including the radwaste area

   d. Supplementation of other systems, such as process radiation monitoring or leak detection, in detecting abnormal migrations of radioactive material

   e. Local alarms to warn personnel in the area

(Step 6.14.2. continued on next page)

Step 6.14.2. (continued from previous page)

3. Effluent monitors provide information about the concentration of radioactive material in plant effluent pathways. Each significant effluent pathway from the plant includes an effluent monitor to enable the quantification of the radioactive material concentration exiting the plant.

6.14.3 Meteorological Monitoring System

1. The Meteorological Monitoring System is composed of a 90-meter instrument tower and a temperature controlled shelter at the base of the tower housing associated instrumentation and equipment.

2. The function of the meteorological system is to monitor and record meteorological conditions.

3. Information provided by instruments at the meteorological tower is available from the NPIS computer system.

4. Time interval measurements are used in calculating 15-minute averages for all parameters.

5. When needed, Meteorological data can be obtained from the National Weather Service.

6.14.4 Seismic Monitoring System

1. The seismic warning panel in the Control Room provides local visual and audible indication when a seismic event has occurred.

6.14.5 Hydrologic Monitoring

1. Hydrologic monitoring is not required as WCGS is a "dry site" as defined by Regulatory Guide 1.102. The plant site is located above the design basis flood level.

6.14.6 Fire Protection

1. WCGS is protected by an independent fire protection system consisting of two subsystems, a detection/alarm system and a suppression system.

(Step 6.14.6. continued on next page)

Step 6.14.6. (continued from previous page)

2. Activation of the fire systems results in an audible alarm throughout the plant. Alarms are also displayed in the Control Room.

6.14.7 Laboratory Facilities

1. A radiochemistry (hot) laboratory, radwaste laboratory, and turbine building chemistry laboratory are located in the power block. The chemistry shop laboratory is located in the Walter P. Chrysler Building. Further information on on-site laboratory equipment can be found in USAR, Chapter 12.5.

2. The chemistry shop laboratory on site may be used for processing of routine and emergency field samples. The Kansas Health And Environmental Laboratory in Topeka, KS, or alternate facility is available to further augment the processing of emergency samples.

3. Private laboratories under contract to WCGS or laboratories of neighboring utilities who are signatories of the INPO Voluntary Assistance Agreement may be considered for use.

6.15 Emergency Supplies

6.15.1 Emergency supplies include protective, communications, and radiological monitoring equipment, check sources, and other supplies. The EPPs list emergency supplies and their locations.

6.15.2 Emergency supplies are maintained, inventoried, and inspected on a quarterly basis in accordance with EPPs. The EPPs contain an inventory list of WCGS equipment for emergency supplies. This equipment may be augmented by other on-site equipment.

6.15.3 Instruments are calibrated in accordance with WCGS Radiation Protection Procedures. For any items removed from the emergency supplies for calibration or repair, an operable equivalent instrument is used to replace it. Sufficient quantities of spare instruments/equipment are on site to provide replacements.

6.16 Communications

6.16.1 Communication Equipment

1. Telephones provide primary communications contact with the State and County EOCs. The on-site system in the Olive Beech Building and the off-site system in EOF are powered by their own battery and charger. The battery will supply the system if the charger fails.

   a. The Emergency Telecommunications System (ETS) is used for NRC communications.

   b. Trunk lines are available for communications with outside agencies.

   c. Cell phones or other comparable equipment are used as a backup means of communications with joint radiological monitoring teams.

2. Radio communications provide backup communications with the State and County EOCs. Fixed AC-powered transmitter/receiver units and a number of portable and hand-held units are also capable of providing fixed and mobile communications to joint radiological monitoring teams.

   a. Radio communication is the primary communication method for the joint radiological monitoring teams.

3. A paging system is used for initial notification of key personnel. Pager coverage is provided in and around the cities of Burlington, Emporia, Topeka, Ottawa and Lawrence.

6.16.2 Communication Dissemination

1. The methods of employee communications may be employee meetings, announcements, or literature handouts.

2. The Public Information Organization is responsible for interfacing with the media. Communication between WCGS and media organizations are performed in accordance with EPPs.

(Step 6.16.2. continued on next page)

Step 6.16.2. (continued from previous page)

3. Annually, WCGS offers the news media with the following information:

   o Information concerning the emergency plan

   o Information concerning radiation

   o Facilities available for media

   o Points of contact for statements of public information

   o Differences between normal and emergency plant operations

4. WCGS, state, and local emergency organizations provide members of the public, including transients, public education information on how they are notified and what their initial actions should be during an emergency.

   a. Emergency planning information is provided within local telephone directories. The information, developed jointly by WCGS, Coffey County and the State of Kansas, is distributed to residences of the EPZ.

   b. Information includes educational facts on radiation, protective measures, special needs of the handicapped and the points of contact for additional information.

5. Emergency planning information, displayed on information boards, is provided for transients in the public use areas of John Redmond Reservoir (JRR), Coffey County Lake (CCL), and other WCGS controlled areas. Transients have access to emergency plan information within motel rooms and telephone books.

6.17 <u>Emergency Plan Training</u>

6.17.1 WCGS has developed an emergency preparedness training program which meets the requirements of 10CFR50, Appendix E, Section IV. F.

6.17.2 The Manager Emergency Planning ensures required training is provided for ERO personnel in accordance with plant procedures.

6.17.3 The Manager Emergency Planning ensures corrective actions for any Emergency Planning weakness or deficiencies identified are initiated and corrected using the WCGS corrective action process.

6.17.4 Personnel receive general RERP training as a portion of Plant Access Training prior to receiving unescorted access to WCGS.

6.17.5 Initial and re-qualification training is provided for personnel on the ERO. This training may be in the form of self study, class room training, drills, tabletops, or any combination of these.

1. Position specific training is provided for personnel filling positions in the following areas:

   - o Managers/Coordinators of the emergency
   - o Personnel responsible for accident assessment
   - o Radiological monitoring teams
   - o Fire brigade members
   - o Emergency response teams
   - o Medical support personnel
   - o Security personnel
   - o Support personnel

2. Critiques are performed and end of course feedback solicited after each training class to identify weak or deficient areas.

6.17.6 Where Letters of Agreement exist between WCGS and local agencies and for each off-site response organization's emergency support role, training is offered annually. Training is also offered to the participants in the Interlocal Agreement between Coffey County and host county Lyon.

1. This training consists of an orientation to plant operations and site access procedures, basic radiation protection and monitoring information, procedures for notification, an overview of the ERO duties and activities, and training materials associated with performance of their expected roles.

6.17.7 Drills are considered part of the Emergency Plan Training Program. Periodic drills conducted between the biennial exercise ensure that the ERO is capable of executing the principal functional areas of emergency response including activities such as management and coordination of emergency response, accident assessment, event classification, notification of off-site authorities, assessment of the on-site and off-site impact of radiological releases, protective action decision making, plant system repair and mitigative action implementation.

1. State and County participation in drills will be allowed if they so desire.

6.18 <u>Emergency Plan Drills</u>

6.18.1 Annual communication drills between WCGS, State and County EOCs, and field assessment teams ensure that contact can be made and that messages are comprehended.

1. Monthly communication tests verify communications with the local County and State authorities. Communications tests are made with the NRC Headquarters via the Emergency Telecommunications System (ETS). These tests are performed in accordance with EPPs.

6.18.2 Fire drills are conducted in accordance with plant administrative procedures.

6.18.3 Annual medical emergency drills include transportation and treatment of simulated contaminated individuals by off-site medical treatment facilities.

6.18.4 Annual radiological monitoring drills include collection and analysis of sample media, field activities, and provisions for communications and record keeping.

6.18.5 Semi-annual Health Physics drills involve response to and analysis of simulated elevated airborne and liquid samples and direct radiation measurements in the environment.

6.18.6 Each calendar quarter, a callout drill is conducted to verify the operability of the notification system.

6.18.7 Critiques are conducted following each drill to identify and correct noted weaknesses and deficiencies.

6.18.8 Terrorist-based-event drills will be conducted as directed by FEMA and the NRC. **[Commitment Step 3.2.2]**

6.19 Emergency Planning Exercises

6.19.1 In accordance with 10CFR50 Appendix E, Section IV.F, emergency exercises will test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communication networks, test the public notification system, and ensure that ERO personnel are familiar with their duties.

6.19.2 Exercises will be conducted biennially to test the on-site and off-site emergency plans. Exercises ensure that the ERO is capable of executing the principal functional areas of emergency response including activities such as management and coordination of emergency response, accident assessment, event classification, notification of off-site authorities, assessment of the on-site and off-site impact of radiological releases, protective action decision making, plant system repair and mitigative action implementation.

6.19.3 To meet NRC and FEMA requirements, the exercises are varied so as to test, at least once every eight years, all major components of the WCGS, State, and County plans and response organizations. The State and County actively participate in these exercises.

6.19.4 Each scenario variation shall be demonstrated at least once during the eight year exercise cycle and shall include, but not be limited to, the following:

1. Exercises should be conducted under various weather conditions.

2. Hostile action directed at the plant site involving the integration of off-site resources with on-site response.

3. An initial classification of or rapid escalation to a Site Area Emergency or General Emergency.

4. No radiological release or an unplanned minimal radiological release that requires the site to declare a Site Area Emergency, but does not require declaration of a General Emergency.

(Step 6.19.4. continued on next page)

Step 6.19.4. (continued from previous page)

5. Implementation of strategies, procedures and guidance developed under 10 CFR 50.155(b)(2).

6. Start a drill or exercise between 6:00 p.m. and 4:00 a.m. Some drills or exercises should be unannounced.

7. Large radiological release requiring ingestion pathway protective actions beyond the 10 mile EPZ.

6.19.5 Terrorist-based-event exercises will be conducted as directed by FEMA and the NRC. **[Commitment Step 3.2.2]**

6.19.6 Designated observers from federal, state, local governments, and WCGS observe the required exercises. Certain of these observers also evaluate the exercise.

1. The Manager Emergency Planning has the lead responsibility for ensuring corrective actions associated with emergency planning are initiated.

2. Critiques are conducted following each exercise to identify and correct noted weaknesses and deficiencies.

6.19.7 Prior to an exercise a scenario package is prepared which contains the following:

- o Basic objective of each exercise and appropriate evaluation criteria that support demonstration of key skills in principle functional areas
- o Simulated events
- o Dates, time periods, places, and participating organizations
- o Time schedule of all initiating events
- o Descriptive scenario addressing the conduct of the exercise which should include public information activities, off-site fire department assistance, simulated casualties, rescue of personnel, use of protective clothing and radiological monitoring teams
- o Description of the arrangements for, and advance materials to be provided to official observers

6.19.8 Records of exercises conducted during the eight year cycle shall be maintained that document the content of scenarios used to comply with scenario variation requirements.

6.19.9 The exercise scenario shall be submitted to the NRC under 10 CFR 50.4 at least 60 days prior to the evaluated exercise.

6.19.10 Remedial exercises will be conducted for exercises which do not satisfactorily test the emergency response plan as determined by FEMA and the NRC.

6.20 Emergency Plan and Procedures Administrative Controls

6.20.1 The Quality Assurance Organization is responsible for assuring that a review of the WCGS Emergency Planning and Preparedness Program will be performed, at least once every twelve months, in accordance with 10CFR 50.54(t).

1. Personnel performing this review will have no direct responsibility for implementation of the Emergency Planning and Preparedness Program.

2. The review shall evaluate interfaces with state and local governments, licensee drills, exercises, capabilities, procedures and emergency facilities.

3. The results of the review are reported to owner representatives and WCGS Senior Management and shall be retained for at least five years.

4. Correction of review findings are evaluated and implemented using normal WCGS procedures.

5. The applicable portions of the review shall be made available to the State and local governments.

6.20.2 The Manager Emergency Planning ensures the coordination and documentation of RERP reviews and revisions and the RERP distribution. The RERP is revised annually to incorporate changes identified during drills, exercises and the 10CFR 50.54(t) review.

1. The RERP and approved changes are distributed to all organizations and individuals with responsibility for implementation of the RERP.

6.20.3 The Manager Emergency Planning ensures emergency planning personnel are properly trained.

6.20.4 Action items required to be performed in a time period are allowed a 1.25 times frequency grace period to complete the item.

6.21 Recovery Plan

6.21.1 The Recovery Plan is activated in a progressive manner when the Site, if EOF not activated, or Off-Site Emergency Manager determines stabilized plant conditions warrant the transition of the emergency response efforts to the recovery phase.

6.21.2 **IF** a General Emergency has been reached, **THEN** NRC and KDEM concurrence shall be obtained prior to downgrading.

6.21.3 The EPPs provide the general plans for reentry and recovery and describe the means by which decisions to relax protective measures are reached.

1. Evaluation of the status of the three fission product barriers is used for de-escalation. As the situation improves and barriers are restored, the next lower level of event may be declared.

2. De-escalation may also occur if conditions have stabilized such that the potential for re-escalation to a higher level has been removed and a controlled situation exists. A declaration of de-escalation is provided by the Emergency Manager based on known information and recommendations of the ERO.

3. Guidelines are provided for Reentry Team(s) to perform surveys and monitoring activities to be employed for initial reentry.

6.21.4 During the recovery process the normal procedures employed for configuration control, reporting, interfaces with regulatory agencies and support groups, exposure control, environmental monitoring, and procurement of supplies and services shall be utilized.

6.21.5 The Recovery Plan utilizes the necessary technical, administrative, managerial and support personnel that may be required for the recovery phase of emergency response, as determined by Site or Off-site Emergency Managers. The responsibilities and functions of the Emergency Managers and staff are detailed in the EPPs.

7.0 RECORDS

7.1 None

8.0 FORMS

8.1 APF 06-002-02, EMERGENCY ACTION LEVELS TECHNICAL BASES [3.2.1]

8.2 APF 06-002-03, EAL CLASSIFICATION MATRIX [3.2.1]

ATTACHMENT A
(Page 1 of 1)

EFFECTIVE 10-MILE EPZ POPULATION

Significant Population Centers	Approximate Population	Subzone	Distance (miles) And Direction From The Site To Population Center
Burlington, KS	2,674	SW-1	3.5 Southwest
New Strawn, KS	394	W-1	3.4 West-Northwest
Waverly, KS	592	NE-2	11.5 North-Northeast
LeRoy, KS	561	SE-3	11.1 South-Southeast
Aliceville, KS	40	SE-2	9.3 Southeast
Ottumwa, KS	20	NW-1	6.8 West-Northwest
Sharpe, KS	10	N-1	2.4 North
Jacob's Creek	70	W-2	10.0 West

The city population numbers were taken from the **2010** census.

-END-

ATTACHMENT B
(Page 1 of 2)

SUBZONE EVACUATION TIMES

B.1 Table B.1 lists each subzone and the population in that subzone.

TABLE B.1
POPULATION BY SUBZONE

Evacuation Subzone	Evacuation Zone	Population
Center (CTR)	0 - 2	132
North-1 (N-1)	2 - 5	27
Northeast-1 (NE-1)	2 - 5	48
East-1 (E-1)	2 - 5	62
Southeast-1 (SE-1)	2 - 5	57
South-1 (S-1)	2 - 5	45
Southwest-1 (SW-1)	2 - 5	2,854
West-1 (W-1)	2 - 5	480
Northwest-1 (NW-1)	2 - 5	112
North-2 (N-2)	5 - 10	163
Northeast-2 (NE-2)	5 - 10	682
Northeast-3 (NE-3)	5 - 10	115
East-2 (E-2)	5 - 10	54
Southeast-2 (SE-2)	5 - 10	124
Southeast-3 (SE-3)	5 - 10	662
Southeast-4 (SE-4)	5 - 10	45
South-2 (S-2)	5 - 10	81
Southwest-2 (SW-2)	5 - 10	137
West-2 (W-2)	5 - 10	167
Northwest-2 (NW-2)	5 - 10	149

B.2 Total Coffey County population equals 8,601 persons (2010 census). Effective 10-Mile Emergency Planning Zone Subtotals are as follows:

- Effective 0 - 2-mile zone = 8 persons
- Effective 2 - 5-mile zone = 3,345 persons
- Effective 5 - 10-mile zone = 2,843 persons
- Effective 0 - 10-mile zone = 6,196 persons

B.3 Table B.2 lists evacuation confirmation time parameters.

TABLE B.2
EVACUATION CONFIRMATION TIME PARAMETERS

EPZ Location	Miles Traveled	Number of Houses	Speed Between Houses	Effort in Vehicle	Vehicles Assumed Available	Confirmation Time
Burlington	36	1,183	5 mph	105 Hrs	11	9.5 Hrs
New Strawn	3	229	5 mph	20 Hrs	3	6.6 Hrs
LeRoy	9	289	5 mph	43 Hrs	5	8.6 Hrs
Waverly	7	280	5 mph	33 Hrs	4	8.3 Hrs
Remaining EPZ*	289	649	30 mph	80.5 Hrs	8	10.3 Hrs

* Includes the evacuation confirmation of the U.S. Army Corps of Engineers areas at John Redmond Reservoir, Coffey County Lake, and the U.S. Fish and Wildlife Service area north of the Neosho River.

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SUBZONE EVACUATION TIMES

B.4 Coffey County has Letters of Agreement or Mutual Aid Agreements with surrounding medical transport groups and the Coffey County Public Transportation to assist with transportation for non-ambulatory persons. For all transportation-dependent people, including the non-ambulatory occupants of the Burlington Life Care Center, Sunset Manor Nursing Home, and the Coffey County Hospital, an evacuation time of 2.5 hours is estimated using area resources.

B.5 Tables B.3 and B.4 list the 10-mile evacuation times for average and adverse weather conditions.

TABLE B.3 10-MILE EVACUATION TIMES FOR **AVERAGE** WEATHER CONDITIONS (HOURS)		**TABLE B.4** 10-MILE EVACUATION TIMES FOR **ADVERSE** WEATHER CONDITIONS (HOURS)	
Subzone	Effective 10-mile	Subzone	Effective 10-mile
CTR	1:20	CTR	2:00
CCL	1:20	CCL	2:00
JRR	1:20	JRR	2:00
N-1	1:30	N-1	2:15
NE-1	1:20	NE-1	2:00
E-1	1:25	E-1	2:00
SE-1	1:25	SE-1	2:00
S-1	1:30	S-1	2:15
SW-1	1:45	SW-1	2:25
W-1	1:45	W-1	2:25
NW-1	1:45	NW-1	2:25
N-2	1:45	N-2	2:20
NE-2	1:40	NE-2	2:20
NE-3	1:30	NE-3	2:05
E-2	1:35	E-2	2:10
SE-2	1:35	SE-2	2:10
SE-3	1:45	SE-3	2:25
SE-4	1:40	SE-4	2:20
S-2	1:45	S-2	2:25
SW-2	1:50	SW-2	2:30
W-2	1:50	W-2	2:25
NW-2	1:40	NW-2	2:25

-END-

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
A. - ASSIGNMENT OF RESPONSIBILITY (Organization Control)			
1.a	6.5, 6.6, 6.8, 6.9	WCGS on-site and off-site organizations	EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS EPP 06-004, PUBLIC INFORMATION ORGANIZATION
1.a	6.10, 6.11, 6.12, 6.13	Outside organizations	
1.b	6.5 - 6.13		
1.c	FIGURE 6		
1.d	6.5, 6.6, 6.8, 6.9		EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
1.e	6.5.2	Notifications are made from the control room, at the direction of the Site Emergency Manager.	
2.a & 2.b	N/A		
3.	ATTACH. G		
4.	6.8.2	Off-site Emergency Manager	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
	6.6.11, 6.8.8	Administrative Coordinators	EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
B. - ON-SITE EMERGENCY ORGANIZATION			
1.	6.5, Figure 2		EPP 06-001, CONTROL ROOM OPERATIONS
2.	6.5.2	Site Emergency Manager	EPP 06-001, CONTROL ROOM OPERATIONS
3.	5.1.1, 5.2.1, 5.8.1, 6.5.2, 6.6.5, 6.6.5.1, 6.8.2	Transfer of control from the Shift Manager to the Site Emergency Manager.	EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
B. - ON-SITE EMERGENCY ORGANIZATION			
4.	6.5.2, 6.6.5, 6.8.2	Responsibilities of the Shift Manager, Site Emergency Manager, Off-site Emergency Manager	EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
5	6.5, 6.6, 6.7, 6.8, 6.9	Major ERO positions and their functions	EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
6.	6.5, 6.6, 6.7, 6.8, 6.9, Fig. 5 & 6	Interfaces between WCGS and outside organizations	
7a.	6.8.8	Administrative Coordinator	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
7b.	6.21	Recovery Plan	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
7c.	6.8.2	Duty Emergency Manager	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
7.d	6.9	Off-site Public Information Coordinator & Wolf Creek Public Information Officer	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS EPP 06-004, PUBLIC INFORMATION ORGANIZATION
8.	6.13	Specify contractors / organizations available on request	
9.	6.10	Identify local support agencies	
C. - EMERGENCY RESPONSE SUPPORT AND RESOURCES			
1.a	6.8.2	Persons authorized to request assistance	
1.b	6.12	Expected Federal resources	
1.c	6.4.1, 6.4.2, 6.4.4, 6.12.5	Space is provided for NRC personnel in the Control Room, TSC, and EOF. The EOF also has limited space for state and local personnel.	
2a.	N/A		
2.b	6.8.10		

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
C. - EMERGENCY RESPONSE SUPPORT AND RESOURCES			
3.	6.14.7	Identify radiological laboratories	
4.	6.13 and ATTACH G	Identify other facilities and organizations which could assist	
D. - EMERGENCY CLASSIFICATION SYSTEM			
1.	6.2	Emergency Classifications	EPP 06-005, EMERGENCY CLASSIFICATION
2.	6.2	Initiating conditions	EPP 06-005, EMERGENCY CLASSIFICATION
3. & 4.	N/A		
E. - NOTIFICATION METHODS AND PROCEDURES			
1.	6.3.3, 6.5.2, 6.6.5, 6.8.2	Notifications	EPP 06-007, EMERGENCY NOTIFICATIONS
2.	6.16.1, 6.5.3	Notification of responding personnel	EPP 06-015, EMERGENCY RESPONSE ORGANIZATION CALLOUT
3.	6.3.3, 6.5.2, 6.6.5, 6.8.2	Initial notifications	EPP 06-007, EMERGENCY NOTIFICATIONS
4.a thru 4.n	6.5.2, 6.6.5, 6.8.2	Follow-up Notifications	EPP 06-007, EMERGENCY NOTIFICATIONS
5.	N/A		
6.	6.10.3, 6.3.4.3, Attach B	Evacuation times	
7.	6.16.2.4		
F. - EMERGENCY COMMUNICATIONS			
1.a	6.5		
1.b	6.5.2		
1.c	6.5.2, 6.5.3, 6.6.5, 6.6.9, 6.8.2		
1.d	6.4.4, 6.16		
1.e	6.5.3, 6.16.1	ERO Callout	EPP 06-015, EMERGENCY RESPONSE ORGANIZATION CALLOUT

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
F. - EMERGENCY COMMUNICATIONS			
1.f	6.4.4, 6.5.2, 6.5.3, 6.6.9, 6.16.1		EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
2.	6.10.6		
3.	6.15, 6.18.1, 6.18.6		EPP 06-018, MAINTENANCE OF EMERGENCY FACILITIES AND EQUIPMENT/COMMUNICATION CHECKS
G. - PUBLIC EDUCATION AND INFORMATION			
1.	6.16.2		
2.	6.17.5, 6.17.6		
3.a	6.4.5, 6.16.2		EPP 06-004, PUBLIC INFORMATION ORGANIZATION
3.b	6.4.5		
4.a	6.9.2		EPP 06-004, PUBLIC INFORMATION ORGANIZATION
4.b	6.9.2, 6.9.9		EPP 06-004, PUBLIC INFORMATION ORGANIZATION
4.c	6.4.5, 6.9.8		EPP 06-004, PUBLIC INFORMATION ORGANIZATION
.	6.16.2		
H. - EMERGENCY FACILITIES AND EQUIPMENT			
1.	6.4.2, 6.4.3, 6.6, 6.7		EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS
2.	6.4.4, 6.8		EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
3.	6.8	Establish EOF.	
4.	6.6.1, 6.8.1, Fig.2,3,4 ATTACH. D		
5.a	6.14.3, 6.14.4, 6.14.5		
5.b	6.4.1, 6.4.2, 6.14.2		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
5.c	6.2.2, 6.14.2		
5.d	6.14.6		
6.a	6.14.1		

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
H. - EMERGENCY FACILITIES AND EQUIPMENT			
6.b	6.14.1, Figure 8 & Figure 9		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
6.c	6.14.7		
7.	6.15		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
8.	6.14.3		
9.	6.4.3		EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS
10.	6.15		EPP 06-018, MAINTENANCE OF EMERGENCY FACILITIES AND EQUIPMENT/COMMUNICATION CHECKS
11.	6.15		
12.	6.14.7		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
I. - ACCIDENT ASSESSMENT			
1.	6.2		APF 06-002-02, EMERGENCY ACTION LEVELS BASES APF 06-002-03, EAL CLASSIFICATION MATRIX
2.	6.3.8, 6.14.2		EPP 06-017, CORE DAMAGE ASSESSMENT METHODOLOGY
3.a	6.3.7		EPP 06-012, DOSE ASSESSMENT
3.b	6.3.7		EPP 06-012, DOSE ASSESSMENT
4.	6.3.7		EPP 06-012, DOSE ASSESSMENT
5.	6.14.3		
6.	6.3.7		EPP 06-012, DOSE ASSESSMENT
7.	6.3.8, 6.8.4		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
8.	6.3.7, 6.5.2, 6.6.5, 6.8.2		
9.	6.4.2, 6.4.4	Lower bound for iodine measurement capability is 1.0E-7uCi/cc.	
10.	6.3.7		EPP 06-012, DOSE ASSESSMENT
11.	6.3.8		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
J. - PROTECTIVE RESPONSE			
1.a thru 1.d	6.3.10, 6.3.11, 6.6.5		EPP 06-010, PERSONNEL ACCOUNTABILITY AND EVACUATION

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
J. - PROTECTIVE RESPONSE			
2.	6.3.10, 6.3.11, Figure 1		
3.	6.3.9, 6.3.12, 6.4.8,		
4.	6.3.9, 6.3.12		
5.	6.3.10, 6.3.11, 6.6.5		EPP 06-010, PERSONNEL ACCOUNTABILITY AND EVACUATION
6.a thru 6.c	6.3.13, 6.3.14		EPP 06-013, EXPOSURE CONTROL AND PERSONNEL PROTECTION EPP 06-011, EMERENCY TEAM FORMATION AND CONTROL
7.	6.3.3		EPP 06-006, PROTECTIVE ACTION RECOMMENDATION
8.	Attach. B		
9.	N/A		
10.a & 10.b	Fig. 1		
10.c	6.10.2, 6.16.2		
10.d & 10.1	N/A		
10.m	6.3.4.2		EPP 06-006, PROTECTIVE ACTION RECOMMENDATION
11. & 12.	N/A		
K. - RADIOLOGICAL EXPOSURE CONTROL			
1.a thru 1.g	6.3, 6.4.6, 6.10.5, 6.10.6		
2.	6.3.15, 6.3.16, 6.5.2, 6.6.5, 6.8.2		EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
3.a & 3.b	6.3.16, 6.3.17, 6.3.18, 6.4.2, 6.15.1		
4.	N/A		

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
5.a & 5.b	6.3.20, 6.3.21		
6.a thru 6.c	6.3.21, 6.3.22, ATTACH. E		
7.	6.3.13, 6.4.6		
L. - MEDICAL AND PUBLIC HEALTH SUPPORT			
1.	6.10.5		
2.	6.4.6		
3.	N/A		
4.	6.10.6		
M. - RECOVERY AND REENTRY PLANNING AND POST-ACCIDENT OPERATIONS			
1.0	6.21		EPP 06-008, RE-ENTRY, RECOVERY, AND TERMINATION OPERATIONS
2.	6.21		
3.	6.21		
4.	6.3.7	This is not specifically identified as a post-accident function	
N. - EXERCISES AND DRILLS			
1.a & 1.b	4.17, 6.19		EPP 06-009, DRILL AND EXERCISE REQUIREMENTS
2.a	6.18.1		
2.b	6.18.2		
2.c	6.18.3		
2.d	6.18.4		
2.e(1)	6.18.5		
2.e(2)	6.18.5		
3.a thru 3.f	6.19.7		
4.	6.19.6		
5.	6.19.6		
O. - RADIOLOGICAL EMERGENCY RESPONSE TRAINING			
1.a	6.17		EPP 06-021, TRAINING PROGRAMS
1.b	N/A		
2.	6.17.2, 6.17.5		
3.	6.4.6		
4.	6.17.4		
5.	6.17		

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

P. - RESPONSIBILITY FOR THE PLANNING EFFORT: DEVELOPMENT, PERIODIC REVIEW AND DISTRIBUTION OF EMERGENCY PLANS			
1.	6.17		
2.	5.3, 6.17.2		
3.	6.20.2		
4.	6.20.2		
5.	6.20.2		
6.	6.10, 6.11		
7.	ATTACH. C		
8.	Table of Contents and ATTACH. C		
9.	6.20.1		
10.	6.20.2		

-END-

ATTACHMENT D
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WCGS MINIMUM STAFFING FOR EMERGENCIES

(Reference Step 3.1.10/Step 3.1.11)

FUNCTIONAL AREA(1)	MAJOR TASKS	POSITION TITLE OR EXPERTISE	ON SHIFT	Capability For Additions: ** 60 mins	90 mins
Plant Operations & Assessment of Operational Aspects		Shift Manager (SRO) Control Room Supervisor (CRS) Reactor Operator (RO) Nuclear Station Operator	1 1 2 ~~7~~6***	- - - -	- - - -
Emergency Direction and Control		Shift Manager Site Emergency Manager	1* -	- 1	- -
Notification/ Communication	Notify licensee, State, local and Federal personnel & maintain communication	Emergency Communicator	1	3	-
Radiological Accident Assessment & Support of Operational Accident Assessment	Emergency Operations Facility (EOF Director) Off-site dose assessment Off-site surveys On-site (out-of-plant) In-Plant surveys Chemistry/ radiochemistry	Off-Site Emergency Manager Sr. Radiation Protection Expertise RP Personnel RP Personnel RP Personnel Chemistry Personnel	- 1* - - 2 1	- 1 3 2 1 1	1 1 - - - -
Plant System Engineering, Repair & Mitigative Actions	Technical Support Repair and Mitigative Actions	~~Shift Technical Advisor~~Senior Reactor Operator (SRO) Core/Thermal Hydraulics Eng. Electrical Eng. Mechanical Eng. Radwaste Operator Mechanical Maint. Electrical Maint. I&C Technician	1*~~***~~ - - - 1* - 1* -	- 1 1 1 - 1 1 1	- - - - - - - -
Protective Actions (In-Plant)	Radiation Protection: Access Control Coverage for repair, mitigative actions, search & rescue, first-aid & firefighting	RP Personnel	1*	2	-
Firefighting = Fire Brigade(FB)		--	FB per TRM (TR5.2.1.b)	Local Support	Local Support
Rescue Operations and First Aid		--	2*	Local Support	Local Support

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WCGS MINIMUM STAFFING FOR EMERGENCIES

FUNCTIONAL AREA[1]	MAJOR TASKS	POSITION TITLE OR EXPERTISE	ON SHIFT	Capability For Additions: **	
				60 mins	90 mins
Site Access Control and Account-ability	Security, firefighting communications, personnel accountability	Security Personnel	All per Security Plan		
		TOTAL	~~16~~14	20	2

* May be provided by shift personnel assigned to other functions.

** It is a goal to add, in accordance with this table, to the on-shift capabilities when determined necessary after a declared Emergency.

*** May be provided by a Reactor Operator (RO).

~~**** STA is required in Modes 1-4. An SRO capable of performing STA functions is required in Modes 5, 6 and defueled.~~

(1) Discipline-specific skills training for personnel in the above table are contained in discipline-specific training documents such as AP 30D-006, CHEMISTRY TRAINING PROGRAM and AP 30D-100, RADIATION PROTECTION TRAINING PROGRAMS. **[Commitment Step 3.2.3]**

-END-

ATTACHMENT E
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EPA/KANSAS PROTECTIVE ACTION GUIDES

E.1 Population Protective Action Guides (PAG) For Exposure To A Plume - Early Phase

Protective Action	PAG (Projected Dose)	Comments
Evacuation	1-5 rem (Note 1)	Evacuation (or sheltering should normally be initiated at 1 rem.
Administration of stable iodine (Note 2)	5 rem (Note 3)	Special Populations

(1) Dose is TEDE, which includes effective dose equivalent from external and internal sources and committed effective dose equivalent from inhalation. Committed dose equivalents to the thyroid and to the skin may be 5 and 50 times larger, respectively

(2) Use of KI is not planned for general population in Kansas. The State considers prompt evacuation of the public to be a more effective protective measure than administration of KI.

(3) Committed dose equivalent to be thyroid from radioiodine.

E.2 Emergency Worker Dose Limits (for all types of radiological incidents)

E.2.1 Keep all doses ALARA and limit doses to the following TEDE levels:

Dose Limit (Rem)	Activity	Condition
5	All	
10	Protecting valuable property	Lower dose not practicable
25	Life saving or protection of large populations	Lower dose not practicable
>25	Life saving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved

E.3 Emergency Worker Iodine Dose Limits

E.3.1 Keep all doses ALARA and limit iodine doses to the following committed dose equivalent through use of KI and/or respiratory protection:

Dose Limit (Rem)	Activity
10	Any worker, any phase
No Limit - Life saving activities or protection of large populations	No specific upper limit is given for thyroid dose since in life saving activities; complete thyroid loss might be an acceptable sacrifice if a life can be saved. However, this should not be necessary if respirators and/or thyroid protections for rescue personnel are available as a result of adequate planning.

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EPA/KANSAS PROTECTIVE ACTION GUIDES

E.4 Protective Action Guides For Exposure To Deposited Radioactivity During the Intermediate Phase of a Nuclear Incident

Protective Action	**PAG (Projected Dose)(1)**	**Comments**
Relocate the general population (Note 2)	≥ 2 rem	Beta dose to skin may be up to 50 times higher. Doses in any single year after the first will not exceed 0.5 rem.
Apply simple dose reduction techniques (Note 3)	<2 rem	These protective actions should be taken to reduce doses to as low as practicable levels

(1) The projected sum of effective dose equivalent from external gamma radiation and committed effective dose equivalent from inhalation suspended materials, from exposure or intake during the first year. Projected dose refers to the dose that would be received in the absence of shielding from structures of the application or dose reduction techniques. These PAGs may not provide adequate protection for some long-live radionuclides.

(2) Persons previously evacuated from areas outside the relocation zone defined by this PAG may return to occupy their residences. Cases involving relocation of persons at high risk from such action (e.g. patients under intensive care) should be evaluated individually.

(3) Simple dose reduction techniques include scrubbing and/or flushing hard surfaces, soaking or plowing soil, minor removal of soil from spots where radioactive materials have concentrated, and spending more time than usual indoors or in other low exposure rate areas.

-END-

ATTACHMENT F
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USAR CHAPTER 15 POSTULATED EVENTS

USAR CHAPER 15 POSTULATED EVENTS
Feedwater system malfunctions that result in decrease of feedwater temperature
Feedwater system malfunctions that result in increase of feedwater system flow
Excessive increase in secondary steam flow
Inadvertent opening and failure to close of SG ARV or safety vlv
Steam system piping failure (inside containment)
Steam system piping failure (outside containment)
Loss of external load (Main Generator trip)
Turbine Trip
Inadvertent closure of MSIVs
Loss of condenser vacuum & other events resulting in turbine trip
Loss of non-emergency AC power to station auxiliaries
Loss of normal feedwater
Feedwater system pipe break
Partial loss of forced RCS flow
Complete loss of forced RCS flow
RCP shaft seizure (locked rotor)
RCP shaft break
Uncontrolled RCCA bank withdrawal from a subcritical of low-power startup condition
Uncontrolled RCCA withdrawal at power
RCCA misalignment
Startup of inactive RCP at an incorrect temperature
CVCS malfunction resulting in a decrease in the boron concentration in the RCS
Inadvertent loading and operation of a fuel assembly in improper position
RCCA ejection accidents
Inadvertent ECCS operation at power
CVCS malfunction that increases RCS inventory
Inadvertent opening, with failure to close, of pressurizer safety or relief valve
Break in instrument line or other lines from RCS pressure boundary that penetrate containment
SG tube rupture
LOCA spectrum
Radioactive waste gas decay tank failure
Postulated radioactive releases due to liquid tank failure
Fuel handling accident (inside containment)
Fuel handling accident (Fuel Building)
Spent fuel cask drop
Anticipated transients without scram

-END-

ATTACHMENT G
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LETTERS OF AGREEMENT

Party:

The Coffey County Sheriff's Office

Board of Trustees Fire District No. 1, Coffey County, KS

Newman Regional Health

Coffey County Hospital and EMS

Med-Trans Corporation (formerly Life Star)

LifeSave Transport (formerly Life Team)

Wolf Creek Nuclear Operating Corporation/Callaway Energy Center, Ameren Missouri d/b/a Union Electric Co. Emergency Mutual Assistance Agreement

INPO (Support During an Emergency)

Department of Energy**

Nuclear Regulatory Commission**

National Weather Service***

EPRI/INPO/NEI/Member Utilities Coordination Agreement on Emergency Information****

Westinghouse

Law Enforcement*****

* As of January 1, 1987, the Letters of Agreement in this Supplement are transferred from Kansas Gas and Electric Company to the Wolf Creek Nuclear Operating Corporation. These Letters of Agreement are maintained on file and may be reviewed upon request.

** These LOAs will not be updated. They have been superseded by the publication of the "Federal Radiological Emergency Response Plan" in the Federal Register on 11/8/85.

*** As of 8/25/93, the National Weather Service stated in writing that a Letter of Agreement with WCGS is unnecessary. Their "National Plan for Radiological Emergencies at Commercial Nuclear Power Plants," November 1982, remains in effect.

**** INPO 03-001, INPO Letter of Agreement, is maintained on the INPO web page.

***** Agreements with Law Enforcement are safeguards information and, therefore, are controlled by Security.

-END-

ATTACHMENT H
(Page 1 of 1)

REPORTING OF INCIDENTS PER 10 CFR 20

		.2202 Telephone & Telegraph						.2203 Written		
		Immediate Notification			24 Hour Notification			30 Day Notification		
RADIATION INCIDENTS	**VALUES**	**WCGS**	**NRC**	**KDEM**	**WCGS**	**NRC**	**KDEM**	**WCGS**	**NRC**	**KDEM**
TEDE	25 REM (.25 Sv)	X	X	X				X	X	X
	5 REM (.05 Sv)	X				X	X	X	X	X
	MPE .1201				X			X	X	X
Shallow dose to skin or extremities in excess of	250 Rad	X	X	X				X	X	X
	50 REM	X				X	X	X	X	X
	MPE .1201				X			X	X	X
Lens dose equivalent	75 REM (.75 Sv)	X	X							
	15 REM (.15 Sv)	X				X	X			
	MPE .1201				X			X	X	
The release of radioactive material inside or outside of a restricted area	5 ALI	X	X	X				X	X	X
	1 ALI	X				X	X	X	X	X
	MPE .1201				X			X	X	X

X = Indicates notification is required
MPE = Maximum Permissible Exposure
DAC = Derived Air Concentration
WCGS = Wolf Creek Generating Station
NRC = Nuclear Regulatory Commission
KDEM = Kansas Division of Emergency Management
ALI = Annual Limit on Intake

-END-

FIGURE 1

EFFECTIVE 10-MILE EPZ, SUBZONES AND EVACUATION ROUTES

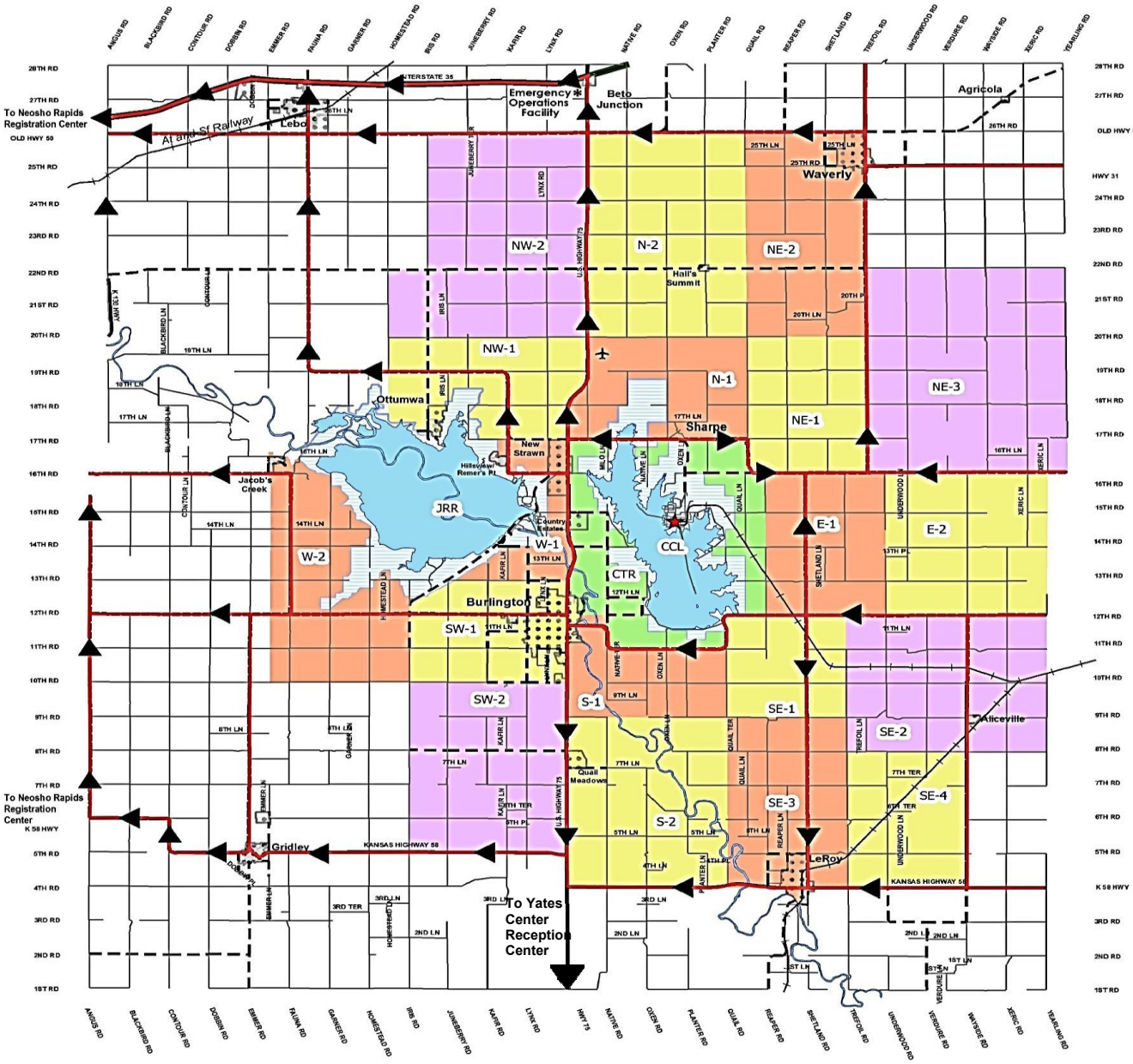
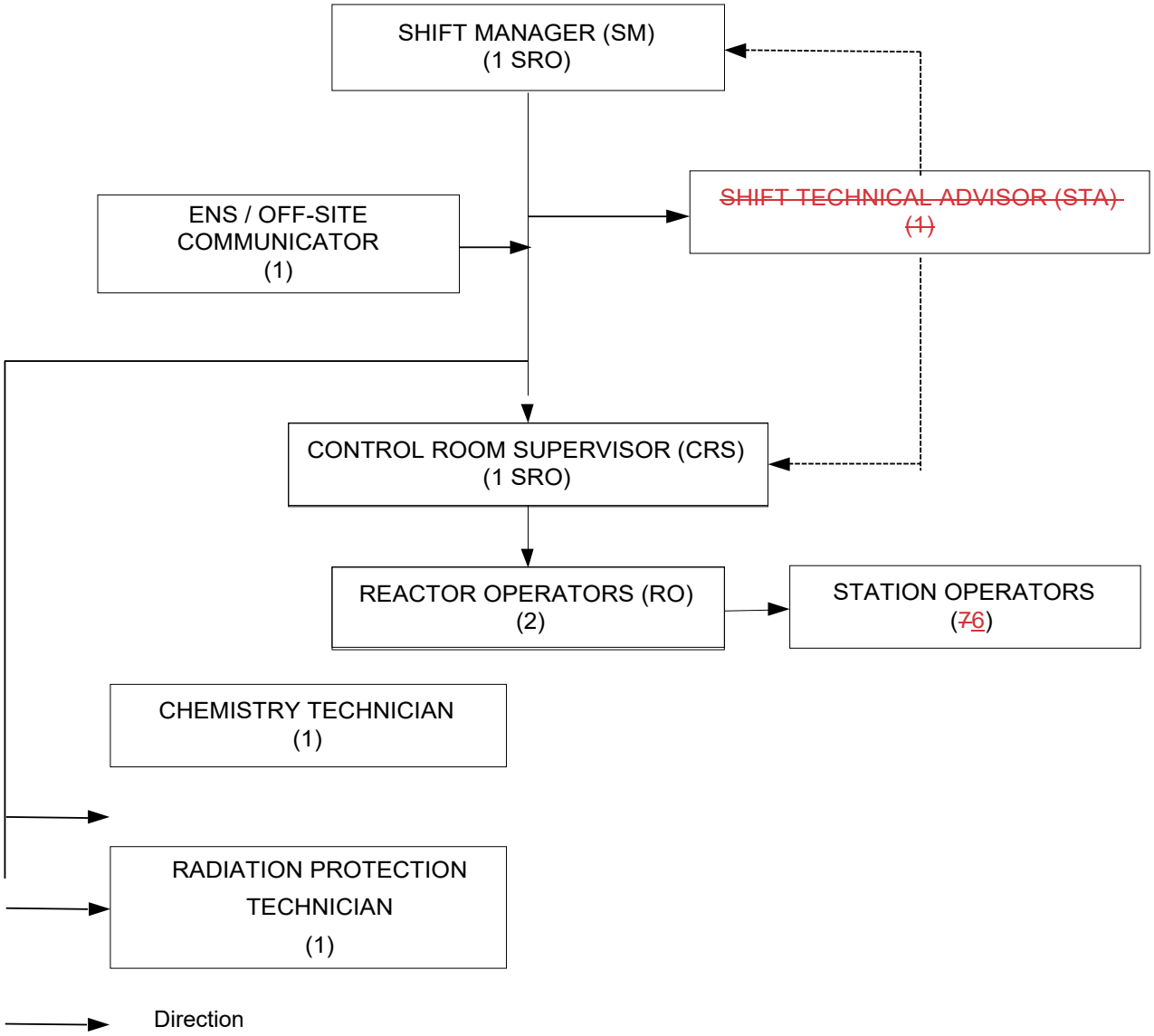


FIGURE 2

MINIMUM SHIFT STAFFING

~~**NOTE**~~

~~**STA is required in Modes 1-4. An SRO capable of performing STA functions is required in Modes 5, 6 and defueled.**~~



SRO = Senior Reactor Operator

FIGURE 3

TSC/OSC ORGANIZATION

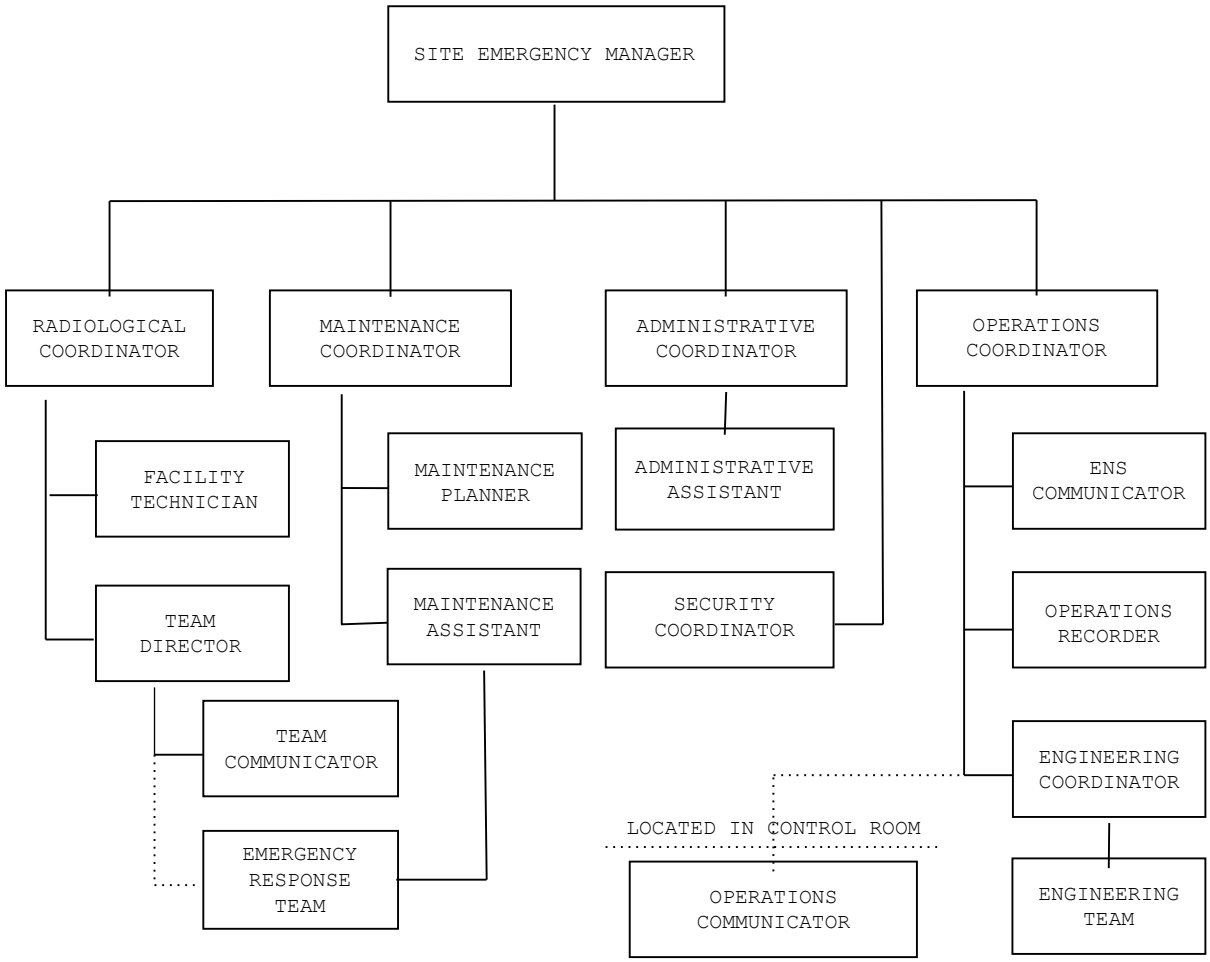


FIGURE 4

EOF ORGANIZATION

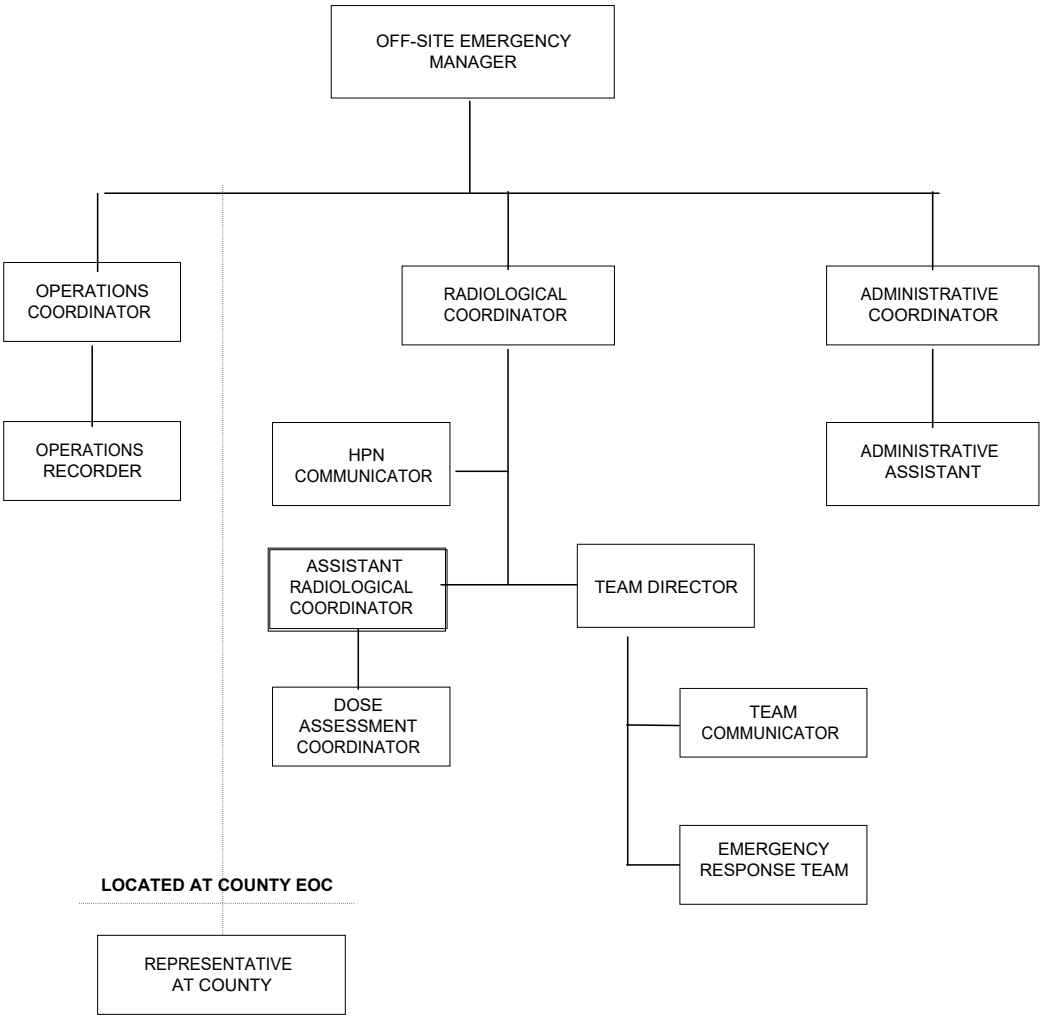


FIGURE 5

PUBLIC INFORMATION ORGANIZATION

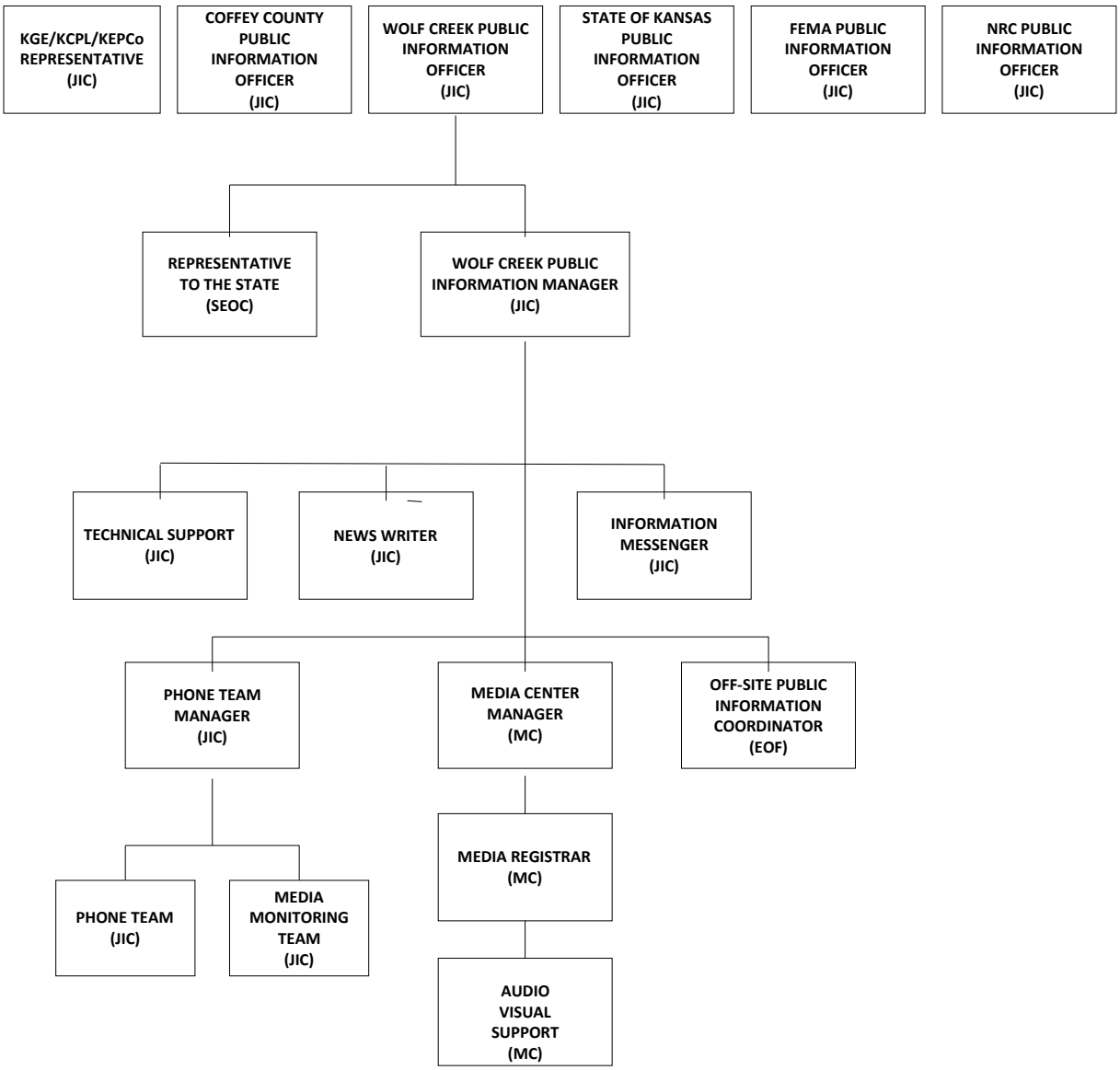
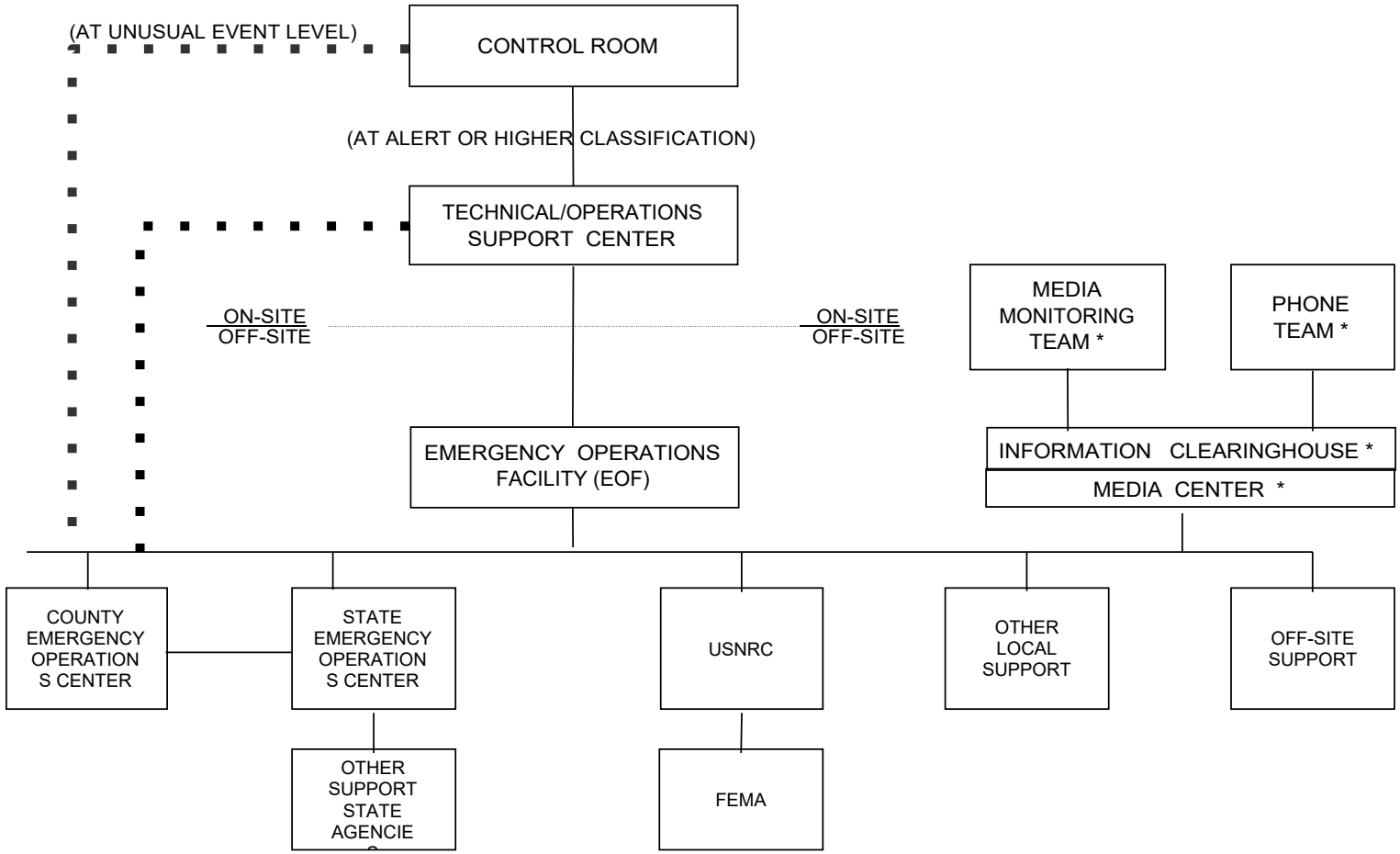


FIGURE 6
EMERGENCY ORGANIZATION INTERFACES

EMERGENCY ORGANIZATION INTERFACES



NORMAL INTERFACE

TEMPORARY INTERFACE

* Any of these functions may be activated at any emergency classification level.

FIGURE 7

WCGS EMERGENCY RESPONSE FACILITIES

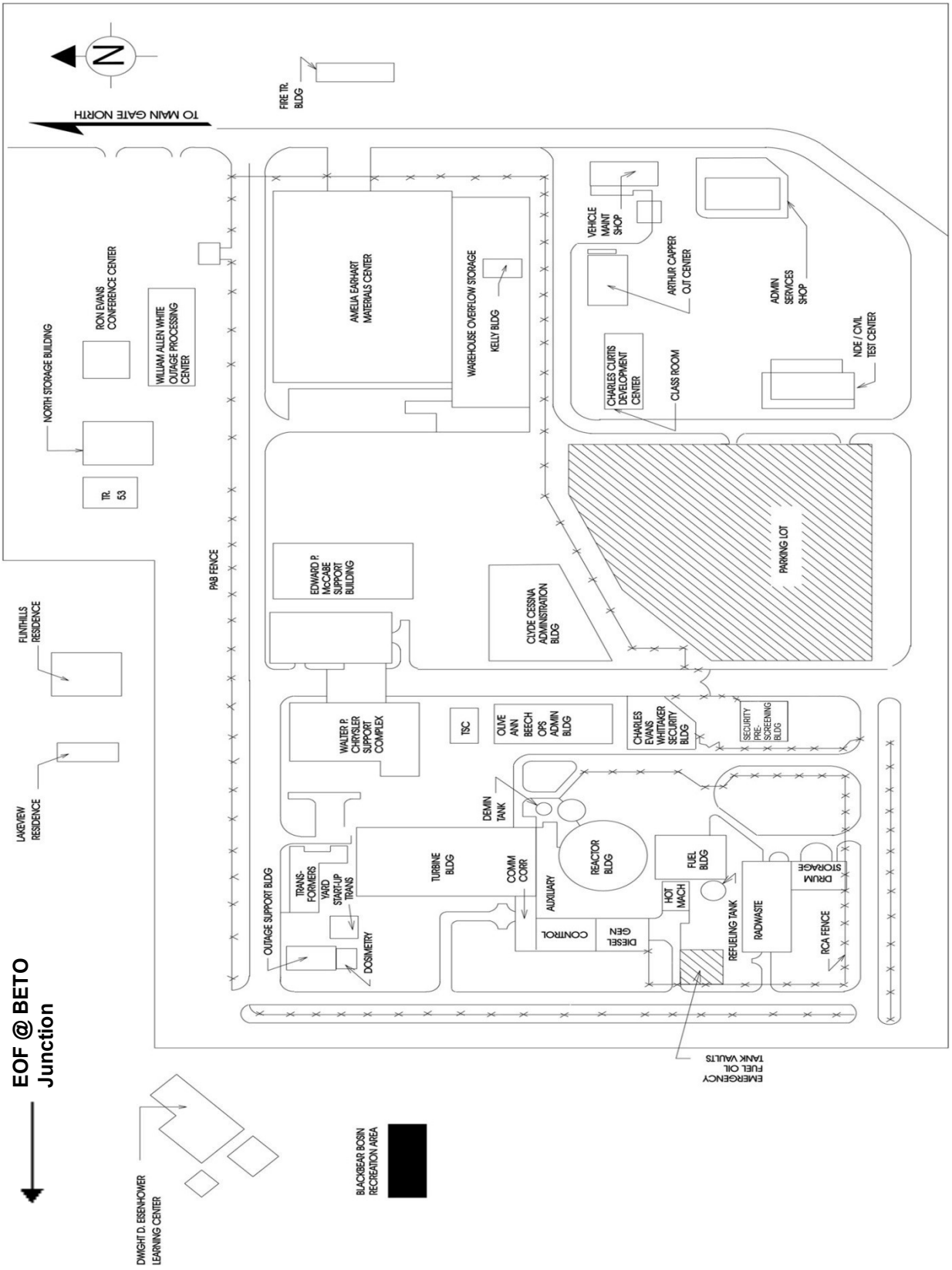
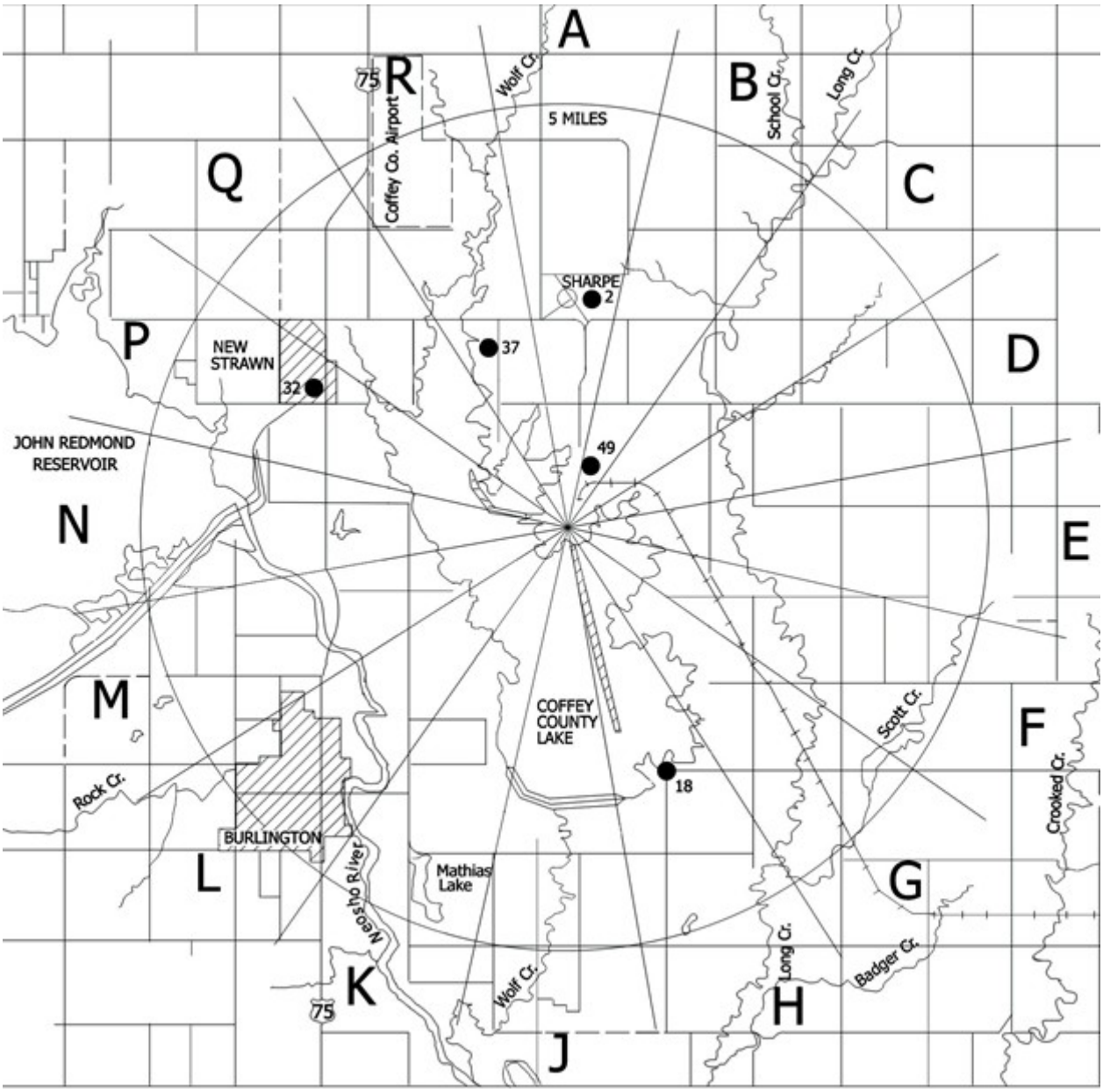


FIGURE 8

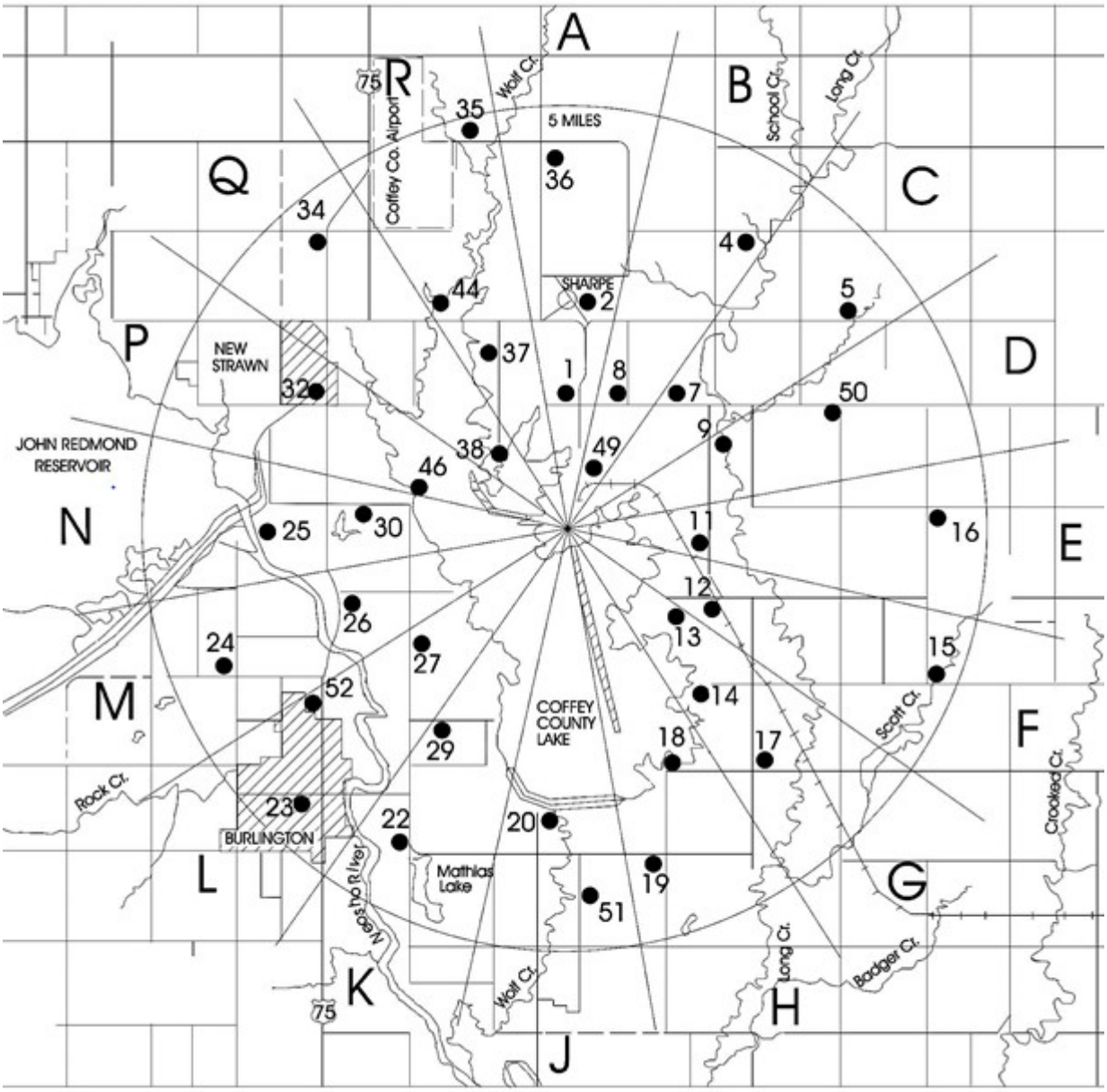
AIRBORNE PATHWAY SAMPLING LOCATIONS



- FIXED SAMPLING LOCATIONS

FIGURE 9

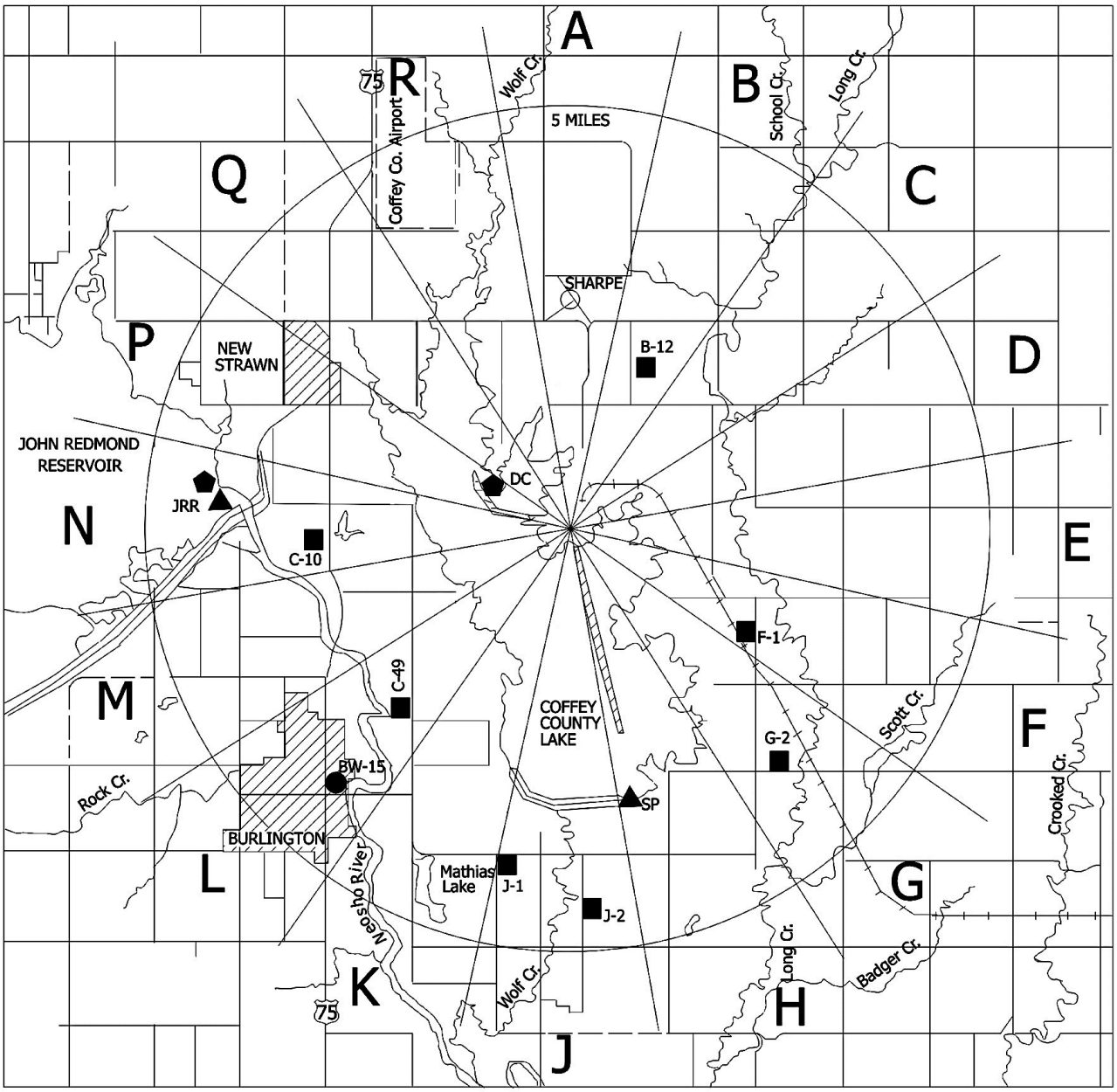
DIRECT RADIATION PATHWAY SAMPLING LOCATIONS



- DOSIMETER LOCATIONS

FIGURE 10

WATERBORNE PATHWAY SAMPLING LOCATIONS



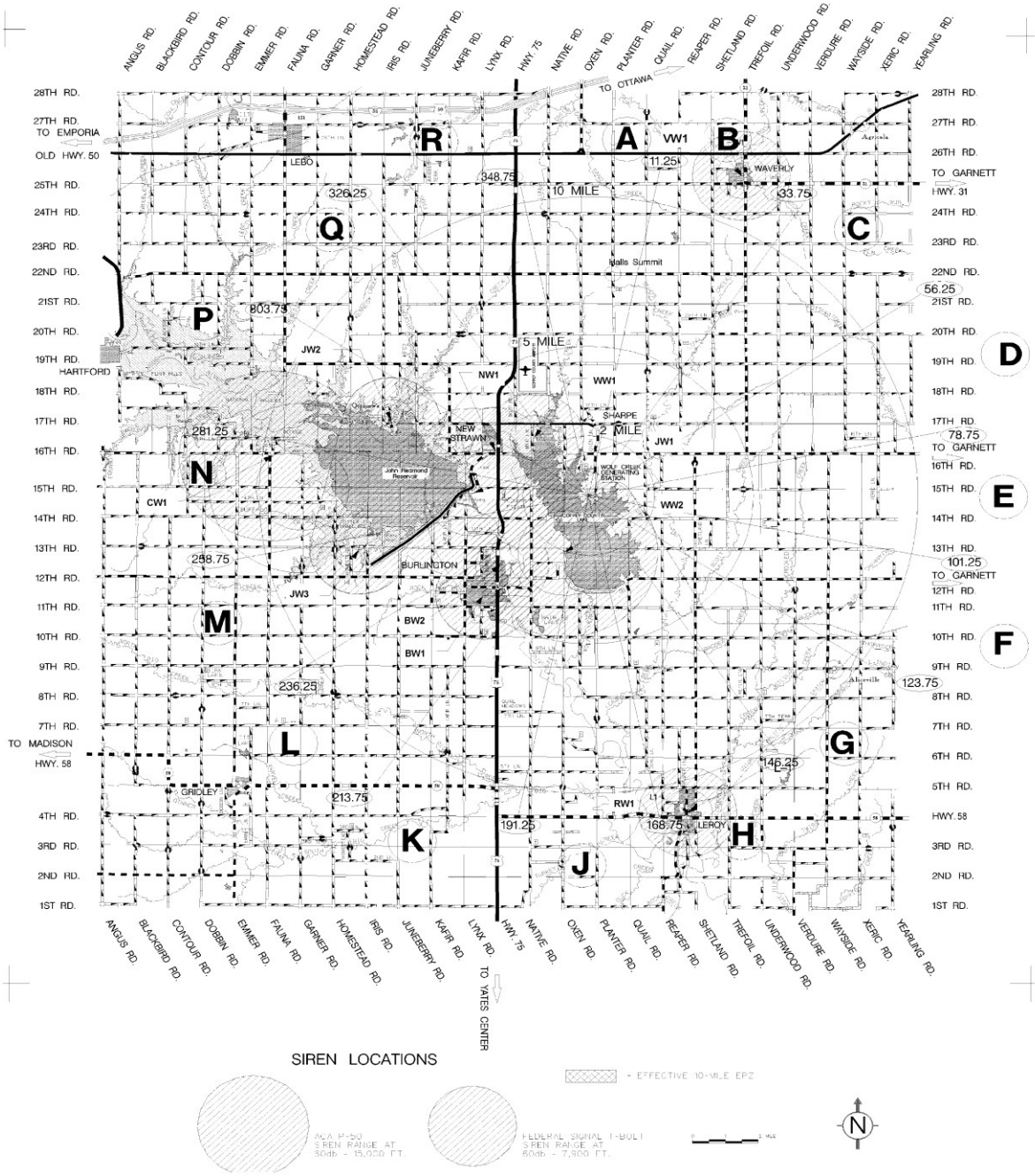
WATERBORNE PATHWAY SAMPLING LOCATIONS

● = DRINKING WATER ▲ = SURFACE WATER

■ = GROUND WATER ⬟ = SHORELINE SEDIMENT

FIGURE 11

FIXED SIREN SITING



ENCLOSURE II

Wolf Creek

an evergy generating station

AP 06-002

RADIOLOGICAL EMERGENCY RESPONSE PLAN (RERP)

RESPONSIBLE ORGANIZATION

Emergency Planning

Revision Number	TBD
Use Category	Information
Administrative Controls Procedure	Yes
Management Oversight Evolution	No
Program Number	06

TABLE OF CONTENTS

1.0 PURPOSE

1.1 The purpose of the Wolf Creek Generating Station (WCGS) Radiological Emergency Response Plan (RERP) is to classify emergencies, assign responsibilities for actions, and to establish the lines of authority and communications to protect the public and plant personnel in the event of an emergency.

2.0 SCOPE

2.1 The RERP has been developed in accordance with 10CFR Part 50, Paragraph 50.47 and Appendix E, Regulatory Guide 1.101 and generally follows the guidelines of NUREG 0696 and 0654. The RERP is sensitive to a broad spectrum of emergency conditions which have been postulated for a commercial pressurized water reactor. Although the probability of an accident is low, the RERP is maintained to assure the safety and well-being of plant personnel and members of the public in the vicinity of WCGS.

2.2 The RERP interfaces with several related documents such as the Administrative Procedures (APs) and Emergency Plan Procedures (EPPs). Detailed instructions necessary to support the RERP are included in these procedures and are available for training, drill, and actual emergency use. The RERP references the WCGS Fire and Security Plans, Vendor contingency plans as well as those of medical support facilities and the Institute of Nuclear Power Operations (INPO). This document has been designed to coordinate with the State Emergency Operations Plan and the Coffey County Contingency Plan for Incidents Involving Commercial Nuclear Power, which govern the activities of these support groups in response to events at WCGS.

2.3 The RERP is based on a graduated, escalating level of emergency response which is activated as conditions at the plant warrant. This approach provides the flexibility necessary to ensure adequate emergency response to a spectrum of possible events. The RERP is designed to control emergency response activities ranging from initial event detection, classification of the event, notification of off-site authorities and providing protective action recommendations to the county and state.

2.4 The RERP reflects three chief phases of activation. First the response is dominated solely by the site staff, next the on-site and off-site public information facilities are jointly activated, and finally the recovery efforts are performed by site, public information facilities, vendor, and other critical support groups.

2.5 The WCGS normal operating organization and its functional responsibilities are described in the WCGS Technical Specifications, Administrative Procedures, Human Resources company organization charts and the WCGS Updated Safety Analysis Report (USAR). No further discussion of the normal operating organization is contained within the RERP.

2.6 The WCGS design bases accidents and various plant systems are listed and described in the WCGS Technical Specifications and USAR. No further discussion of these accidents or systems is contained within the RERP.

2.7 The owners of WCGS do not respond to the site during emergency events for augmentation. The Wolf Creek Nuclear Operating Corporation organization functions from the site during normal everyday operations.

3.0 REFERENCES AND COMMITMENTS

3.1 References

3.1.1 Coffey County Contingency Plan for Incidents Involving Commercial Nuclear Power (County Plan)

3.1.2 The State of Kansas Radiological Emergency Response Plan for Nuclear Facilities

3.1.3 Updated Safety Analysis Report (USAR)

3.1.4 NUREG 0654, Criteria For Preparation And Evaluation Of Radiological Emergency Response Plans And Preparedness In Support Of Nuclear Power Plants

3.1.5 NUREG 0696, Functional Criteria For Emergency Response Facilities

3.1.6 NUREG 0737, Clarification Of TMI Action Plan Requirements

3.1.7 Title 10, Code Of Federal Regulations, Part 50

3.1.8 Regulatory Guideline 1.101

3.1.9 Regulatory Guide 1.145

3.1.10 PIR 2002-1524, Minimum Staffing Requirements

3.1.11 Wolf Creek On-Shift Staffing Analysis

3.1.12 Wolf Creek Generating Station Development of Evacuation Time Estimate (October 2012)

3.1.13 SAP 98-154, Letter 98-02120, Transmittal of Radiation Sources for Wolf Creek Letter Report, November 18, 1998

3.1.14 SAP 99-145, Letter 99-01466, Core Inventory Radiation Sources, September 3, 1999

3.2 Commitments

3.2.1 APF 06-002-02, EMERGENCY ACTION LEVELS TECHNICAL BASES, and APF 06-003-03, EAL CLASSIFICATION MATRIX are required to have a 50.54(q) review performed for each revision.

3.2.2 RCMS #05-118, NRC Bulletin 2005-02 Guidance For Drills And Exercises

3.2.3 CR 00086306, Minimum Staffing Requirements not Met

3.2.4 SAP 98-154, Letter 98-02120, Transmittal of Radiation Sources for Wolf Creek Letter Report, November 18, 1998

3.2.5 SAP 99-145, Letter 99-01466, Core Inventory Radiation Sources, September 3, 1999

4.0 DEFINITIONS

4.1 Administrative Procedures (APs)

4.1.1 Procedures which provide programmatic responsibilities and are typically used to solve problems, assemble documentation, process information, and present results of administrative functions.

4.1.2 Administrative procedures control activities affecting quality or nuclear safety.

4.2 As Low As Reasonably Achievable (ALARA)

4.2.1 Making every reasonable effort to maintain exposures to radiation as far below dose limits as is practical, consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to benefits to the public health safety, and other societal and socioeconomic considerations.

4.3 Alert

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

4.4 Alert and Notification System (ANS)

4.4.1 Alert and notification systems are the means used for prompt notification of the public of protective measures.

4.5 Assessment Actions

4.5.1 Those actions taken during or after an accident to obtain and process information that is necessary to make decisions to implement specific emergency measures.

4.6 Coffey County Emergency Operations Center (County EOC)

4.6.1 The base of operations for the Coffey County Emergency Response Organization.

4.7 Consultant/Vendor

4.7.1 The Nuclear Steam System Supplier (NSSS), Architect/Engineer, and other organizations who have available multidiscipline teams ready to support emergency response and Recovery Operations.

4.8 Control Room

4.8.1 The location at the WCGS from which the reactor and its auxiliary systems are normally controlled.

4.9 Drill

4.9.1 A supervised activity used to develop and maintain skills. On the spot correction of erroneous performance is permitted.

4.10 Emergency Action Levels (EALs)

4.10.1 A pre-determined, site-specific, observable threshold for an Initiating Condition that, when met or exceeded, places the plant in a given emergency classification level.

4.11 Emergency Alert System (EAS)

4.11.1 A coordinated network of broadcasters (e.g. Radio, Television, cable) that allows the President to address the nation, Governors to address their State and public safety officials to address local citizens with emergency information.

4.12 Emergency Classification Level

4.12.1 One of a set of names or titles established by the US Nuclear Regulatory Commission (NRC) for grouping off-normal events or conditions according to (1) potential or actual effects or consequences, and (2) resulting in on-site and off-site response actions. The emergency classification levels, in ascending order of severity, are: Unusual Event (UE), Alert, Site Area Emergency (SAE) and General Emergency (GE).

4.13 Emergency Operations Facility (EOF)

4.13.1 This facility serves as a base of operations for all emergency plant support activities, site environmental surveillance, communications with supporting agencies, and the WCGS Emergency Organization.

4.14 Emergency Plan Procedures (EPPs)

4.14.1 Specific procedures providing step-by-step actions to implement the WCGS Radiological Emergency Response and Recovery Plans, and to provide guidance to improve or terminate an emergency situation.

4.15 Evacuation Registration Center

4.15.1 Facility designated for receiving personnel evacuating the Emergency Planning Zone (EPZ) for accountability, contamination monitoring and decontamination.

4.16 Exclusion Area

4.16.1 That area within a 1200-meter radius of the Containment Building in which WCGS has the authority to determine all activities including exclusion or removal of persons and property from the area.

4.17 Executive Management

4.17.1 Those members of WCGS management at the vice president level and above.

4.18 Exercise

4.18.1 An event that simulates a radiological emergency condition, incorporates the integrated capability of the basic elements existing within the Radiological Emergency Response Plan (RERP). These events are normally evaluated by FEMA / NRC.

4.19 General Emergency (GE)

4.19.1 Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with the 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 off-site for more than the immediate site area.

4.20 Hostile Action

4.20.1 An act toward a Nuclear Power Plant (NPP) or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidates the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the NPP.Non-terrorism-based EALs should be used to address such activities (e.g., violent acts between individuals in the owner controlled area).

4.21 Hostile Force

4.21.1 One or more individuals who are engaged in a determined assault, overtly, or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

4.22 Immediate Notification

4.22.1 Notification made to State of Kansas and Coffey County authorities within 15 minutes of a declared emergency at WGCS.

4.23 Imminent

4.23.1 The trajectory of events or conditions is such that an EAL will be met within a relatively short period of time regardless of mitigation or corrective actions.

4.24 Initiating Condition

4.24.1 An event or condition that aligns with the definition of one of the four emergency classification levels by virtue of the potential or actual effects or consequences.

4.25 Integrated Public Alert Warning System (IPAWS)

4.25.1 IPAWS is a modernization and integration of the nation's alert and warning infrastructure.

4.26 Joint Information Clearinghouse (JIC)

4.26.1 The facility where news statement and news conference materials for the media are prepared.

4.27 State of Kansas Emergency Operations Center (State EOC)

4.27.1 The command-and-control center for the state.

4.28 Licensed Operators

4.28.1 WCGS Reactor Operators and Senior Reactor Operators who are licensed under 10CFR55 and who stand watches on shift and report to the Shift Manager.

4.29 Media Center (MC)

4.29.1 Facility utilized as a focal point for giving information to the media through news conferences.

4.30 Notification of Unusual Event

4.30.1 Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.

4.31 Off-Site

4.31.1 Any area outside the Exclusion Area of WCGS.

4.32 On-Site

4.32.1 Any area inside the Exclusion Area of WCGS.

4.33 Operations Support Center (OSC)

4.33.1 A staging area for emergency teams to support the emergency response effort.

4.34 Owner Controlled Area

4.34.1 Property contiguous to the reactor site and acquired by fee, title or easement for Wolf Creek Generating Station for which public access is limited.

4.35 Protected Area (PA)

4.35.1 An area encompassed by physical barriers and to which access is controlled. The Protected Area refers to the designated security area around the process buildings and is depicted in USAR.

4.36 Protective Actions

4.36.1 Those emergency measures taken before or after a release of radioactive material has occurred for the purpose of preventing or minimizing radiological exposures to personnel.

4.37 Protective Action Guides (PAGs)

4.37.1 Guides promulgated by the Environmental Protection Agency (EPA) which set dose limits for the evacuation of the public during an accident condition at a nuclear power plant.

4.38 Public Inquiry Room

4.38.1 The facility provides Media Monitoring and Rumor Control functions for WCGS, the State and Coffey County.

4.39 Radiologically Controlled Area (RCA)

4.39.1 An area to which access is controlled by WCGS for purposes of protection of individuals from exposure to radiation or radioactive materials.

4.40 Recovery

4.40.1 Post-emergency efforts initiated to restore WCGS to full operation or place the plant in a safe shutdown condition until full operation can be resumed.

4.41 Site Area Emergency (SAE)

4.41.1 Events are in process or have occurred which involve an actual or likely major failure 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.

4.42 Technical Support Center (TSC)

4.42.1 The TSC serves as a center outside of the Control Room that acts in support of the command-and-control function and houses the OSC organization. Plant status and diagnostic information are available at this location for use by technical and management personnel in support of reactor command-and-control functions.

4.43 Wolf Creek Joint Media Center

4.43.1 The Wolf Creek Joint Media Center is central location for coordinated dissemination of public information during emergencies.

5.0 RESPONSIBILITIES

5.1 Site Emergency Manager

5.1.1 Assumes command and control of the emergency and directs on-site response to stabilize plant conditions.

5.2 Off-Site Emergency Manager

5.2.1 Assumes command and control of the emergency and interfaces with off-site agencies.

5.3 Manager Emergency Planning

5.3.1 Ensures the Emergency Planning and Preparedness Program is implemented and maintained as required to protect the health and safety of the public.

5.3.2 Ensures changes to the overall Emergency Planning and Preparedness Program meets the standards of 10CFR50.47(b) and the requirements of 10CFR50, Appendix E.

5.4 Manager Quality

5.4.1 Ensures a review of the WCGS Emergency Planning and Preparedness Program will be performed at least once every twelve months in accordance with 10CFR 50.54(t).

5.5 Chief Executive Officer and Chief Nuclear Officer

5.5.1 Maintains overall authority and responsibility for the WCGS Emergency Preparedness Program.

5.6 Public Information Officer (PIO)

5.6.1 The PIO has the authority and responsibility for the WCGS Public Information Organization and all plant information disseminated to the media.

5.7 Shift Manager (SM)

5.7.1 The Senior Reactor Operator designated by WCGS management with immediate on-site authority and responsibility for the safe and proper operation of the plant. This position is staffed at all times. The Shift Manager is responsible for the initial evaluation of any abnormal or emergency situation and for directing the appropriate response. The Shift Manager assumes responsibilities of the Emergency Manager until relieved.

5.8 Command and Control

5.8.1 Transfer of command and control flows from the Control Room to the Technical Support Center (TSC) and then to the Emergency Operations Facility (EOF). Upon classifying an event, the Shift Manager assumes the role of Emergency Manager. The Site Emergency Manager relieves the Shift Manager of Emergency Manager duties at an Alert or higher emergency classification. The Site Emergency Manager may relieve the Shift Manager of Emergency Manager duties at an Unusual Event upon request from the Shift Manager. After the EOF has been activated, the duties of Emergency Manager are transferred from the Site Emergency Manager to the Off-site Emergency Manager.

6.0 PROCEDURE

6.1 Site Description

6.1.1 WCGS is a Pressurized Water Reactor (PWR) nuclear generating station operated by Wolf Creek Nuclear Operating Corporation (WCNOC).

6.1.2 WCGS is located near the center of Coffey County, Kansas (KS), about 3.5 miles northeast of Burlington, the county seat, 90 miles southwest of Kansas City, MO and 55 miles south of the state capital Topeka, KS.

6.1.3 The immediate site environs are sparsely populated. Burlington and New Strawn are the major population centers. John Redmond Reservoir (JRR) and Coffey County Lake (CCL) are the major recreational facilities. Most of the seasonal or daily shifts in population are associated with recreational areas around JRR and CCL. Approximately 70% of the annual visitors to the John Redmond Reservoir and Coffey County Lake come to the area during the summer months.

6.1.4 The 10-mile Plume Exposure Emergency Planning Zone (EPZ) is a major consideration in the RERP. Approximately 99% of the 10-mile EPZ is located within Coffey County and 1% within Anderson County. The EPZ has been defined by developing sub-zones based upon natural and political subdivisions. These have been described for evacuation zones approximating 2, 5 and 10-mile radial rings. This distribution allows ready identification of areas to be evacuated and facilitates public recognition of subzones in which they work or reside. FIGURE 1, EFFECTIVE 10 MILE EPZ, SUBZONES AND EVACUATION ROUTES, presents the 2, 5 and 10-mile radial zones and subzones which provides the basis for the design of an alert and notification system.

6.1.5 The total population of the effective 10-mile EPZ is shown in ATTACHMENT B, SUBZONE EVACUATION TIMES. With the exception of Burlington and the other population centers listed in ATTACHMENT A, EFFECTIVE 10-MILE POPULATION CENTERS, the population density of the effective 10-mile EPZ is approximately 4.4 persons per square mile. Other than the WCGS, there are no large industries in the area.

6.1.6 Principal geographical features within the effective 10-mile EPZ are the Neosho River, JRR, and CCL. The land around WCGS is flat with scattered low hills. Dense vegetation in the form of large trees exists on the banks of the river and in recreational areas.There are no topographical features within the effective 10-mile EPZ that significantly influence the design of the Alert and Notification System.

1. Sparsely populated farm land comprises the majority of the effective 10-mile EPZ.

2. The site also demonstrates favorable topography, demography, and meteorology, which have been factored into many analyses that support the emergency planning effort.

3. The Neosho River is oriented northwest-southeast and extends to within 3 miles southwest of the plant.

4. The main dam of the John Redmond Reservoir is 3.5 miles west of the plant. This water conservation pool is approximately 4 miles in diameter with a surface area of 15 square miles.

5. The Coffey County Lake is approximately 7 miles long with a normal surface area of 8 square miles.

6.1.7 The meteorological conditions within the effective 10-mile EPZ are characterized by a distinctly continental climate with warm humid summers and highly variable winter weather. Maritime tropical air originating over the Gulf of Mexico is the dominant air mass from June through August. This air mass is quite humid resulting in considerable thunderstorm activity. From November through February, continental polar air dominates the climate.

6.2 Emergency Classifications

6.2.1 10 CFR Part 50, Appendix E, Section IV.C, requires a classification scheme of four specific levels of emergencies. Regulatory Guide 1.101, Revision 4, endorsed the guidance of NEI 99-01, Revision 4, as acceptable to the NRC staff as an alternative method to that described in Appendix 1 to NUREG 0654. NEI 99-01, Revision 6, was reviewed by the NRC and found to be acceptable for use by licensees seeking to upgrade their EALs as endorsed by the NRC in a letter to NEI dated March 23, 2013.

6.2.2 An emergency class is a qualitative estimate of the status of the plant. Inputs to the emergency classification system include the status of plant systems and the levels of radiation in plant areas and effluents. However, an emergency class does not give a qualitative or quantitative estimate of the subsequent status of the plant or radioactive release.

6.2.3 The emergency classes are used by off-site authorities to determine the level of preplanned actions to be taken by their emergency organizations. Protective actions taken on behalf of members of the public are the legal responsibility of state and local government.

1. The functional interfaces between WCGS and other emergency organizations are shown in FIGURE 6, EMERGENCY ORGANIZATION INTERFACES.

6.2.4 The classification system used at WCGS is an approach that ranges from primarily event-based for Unusual Event to primarily symptom or barrier-based for General Emergencies. This is to better assure that timely recognition and notification occurs, that events occurring during refueling and cold shutdown are appropriately covered, and that multiple events can be effectively treated.

6.2.5 The Emergency Action Levels (EALs) are contained in APF 06-002-02, EMERGENCY ACTION LEVELS TECHNICAL BASES and APF 06-002-03, EAL CLASSIFICATION MATRIX. The EALs have been developed and agreed upon by WCGS, the State of Kansas and Coffey County and approved by the NRC.

1. The EALs are reviewed annually by the State and County.

6.2.6 10 CFR Part 50, Appendix E, Section IV.C.2, requires licensees to establish and maintain the capability to assess, classify, and declare an emergency condition within 15 minutes after the availability of indications to plant operators that an emergency action level has been exceeded and shall promptly declare the emergency.

6.2.7 Each emergency classification causes certain actions to happen such as notifications, activation and evacuation.

1. An NUE requires plant personnel, the County and State to be notified. No evacuation or activation required.

2. An Alert requires plant personnel, the County and State to be notified. The Emergency Response Organization (ERO) is called out and the emergency facilities are activated. Accountability may be performed if necessary.

3. A Site Area Emergency requires plant personnel, the County and State to be notified. The ERO is called out and the emergency facilities are activated. The protected area is evacuated of non-responding personnel for accountability. JRR and CCL are evacuated. Accountability for site personnel is performed.

4. A General Emergency requires plant personnel, the County and State to be notified. The ERO is called out and the emergency facilities are activated. The site is evacuated of non-responding personnel. JRR and CCL are evacuated. Accountability for site personnel is performed.

6.3 Emergency Measures

6.3.1 Protective actions to minimize personnel exposure are taken when an incident has occurred, or may occur, which could result in a fission product barrier challenge or breach. In addition, protective actions are taken for personnel on-site for situations such as fires or flooding, where personnel safety is threatened.

6.3.2 Emergency measures consist of assessment, corrective, and protective actions. The Shift Manager and Senior Reactor Operators assume immediate responsibility for accident assessment and mitigation. The RERP and detailed emergency actions are based on the assumption that, in an emergency, licensed operators take appropriate measures to maintain or return the facility to a safe condition, in accordance with operating license conditions and the technical specifications.

1. Callout of the ERO to augment the on-shift staff and to activate the Emergency Facilities is performed at an Alert or higher classification or whenever augmentation is deemed necessary.

6.3.3 Immediate and Follow-up notifications made to State and County authorities provide information for their use in making prompt decisions for notifying the public and ordering off-site protective actions.

1. Immediate notifications are made for each emergency classification.

2. Immediate notifications are made to the Coffey County Sheriff dispatcher and the Kansas Division of Emergency Management State Duty Officer within 15 minutes.

(Step 6.3.3. continued on next page)

Step 6.3.3. (continued from previous page)

3. The notification form contains information agreed upon by WCGS, the State and County for each of the Immediate and Follow-up notifications. The following is a list of information that may be on the form:

   - o Name of facility
   - o Date and time of classification
   - o Classification
   - o Release status, type of material and estimated duration
   - o Message authentication of phone call
   - o Subzones recommended for protective actions
   - o Meteorological conditions
   - o Dose rates at site boundary
   - o Event prognosis, worsening or termination

6.3.4 Actions to protect the general public, and criteria for their implementation, are described in the State Plan. Protective action recommendations (PARs) are made to the County and State authorities.

1. ATTACHMENT E, EPA/KANSAS PROTECTIVE ACTION GUIDES, illustrates the EPA/Kansas PAGs for members of the public in the vicinity of WCGS and contains information typical of what may be used for the PAR guidelines. The ATTACHMENT provides guidelines and action levels to be used to develop protective action recommendations. Wolf Creek makes PARs for releases beyond the 10 mile EPZ. County and State officials have authority to take protective actions off-site.

2. Evacuation is the normally anticipated off-site protective action. Sheltering may be the preferred protective action when it will provide protection equal to or greater than evacuation. ATTACHMENT B, SUBZONE EVACUATION TIMES, contains evacuation times for the general and transient public.

(Step 6.3.4. continued on next page)

Step 6.3.4. (continued from previous page)

3. An Alert and Notification System (ANS) is used to alert the public to incidents at the nuclear power plant and notify them of actions to be taken.

6.3.5 Contact point for information concerning the County Plan, protective measures, and special needs of the handicapped is the County Emergency Management Office.

6.3.6 Additional resources available for accident assessment include accident monitoring and in-plant iodine instrumentation under accident conditions. Detailed discussions of these resources and their capabilities are found in the USAR.

6.3.7 The Emergency Dose Calculation Program (EDCP) is a computerized method to provide dose estimates using actual or estimated meteorological data (wind speed, wind direction, degree of cloud cover, day or night determination) and radiological effluent data (actual measurements, estimated values based upon SAP 98-154 and SAP 99-145 source terms, or field measurements). EDCP is designed to: (Reference Step 3.1.9)

1. Use radiological and meteorological information to provide an estimate of off-site exposure.

2. Be capable of estimating release rates and off-site exposures from off-site field team data.

3. Off-site dose predictions when combined with actual release duration information and meteorological data during an event, provide sufficient data to estimate the cumulative population dose resulting from the event. The actual off-site population dose is confirmed by off-site monitoring, sampling and analysis.

6.3.8 Radiological monitoring teams have a goal of 60 minutes from the declaration of Alert or greater emergency to be ready for deployment to confirm effluent readings and verify plume emission and locations.

o In accordance with EPP 06-011,EMERGENCY TEAM FORMATION AND CONTROL, joint radiological monitoring teams (JRMTs) are comprised of at least two people in any combination from Wolf Creek, Kansas Department of Health and Environment (KDHE), or Coffey County personnel.

6.3.9 FIGURE 7, WCGS EMERGENCY RESPONSE FACILITIES, provides a view of the off-site area, showing the location of the EOF. FIGURE 8, AIRBORNE PATHWAY SAMPLING LOCATIONS shows the fixed air sampling locations. FIGURE 9, DIRECT RADIATION PATHWAY SAMPLING LOCATIONS, shows the direct radiation pathway sampling dosimeter locations. FIGURE 10, WATERBORNE PATHWAY SAMPLING LOCATIONS, shows locations for collecting water samples.

6.3.10 At a Site Area Emergency, General Emergency, or when accountability is required, all personnel not responding to an Emergency Response Facility report to an assembly area for accountability and additional information. ERO personnel report to their assigned emergency facility. Security reports the results of accountability to the TSC.

6.3.11 **IF** the Exclusion Area is evacuated,
THEN Security shall direct an inspection of the lake and land area within the Exclusion Area but outside of the Protected Area to ensure that all personnel not responding to an Emergency Response Facility are evacuated from the Exclusion Area.

6.3.12 WCGS procedures contain decontamination instructions and guidelines. Methods for determining if the individual is a potential inhalation or ingestion contamination case are also provided. The Radiological Coordinator or appropriate Radiation Protection supervisory personnel will review the records generated by decontamination procedures.

1. Decontamination can be performed in the access control area of the Control Building, in the HVAC room of the TSC, and in the garage in the EOF.

2. Other decontamination areas are setup as designated by the Radiation Protection personnel on the ERO.

6.3.13 Respiratory protective devices and protective clothing are stored at several locations on-site and at the EOF. The use of protective clothing and respiratory protection equipment is governed by normal WCGS procedures.

6.3.14 A supply of potassium iodide (KI) is maintained at the Control Room, TSC and the EOF to be used in the event that an individual may be exposed to radioiodine.

6.3.15 There are suggested levels of exposure to be accepted in emergencies. Immediate reentry may be necessary to save a life, account for missing personnel, or secure vital equipment. The Emergency Managers are ultimately responsible for exposure control and can permit the receiving of up to 5 REM per person for work activities, 10 REM for saving valuable equipment and 25 REM for lifesaving after consulting with the NRC, if feasible. Exposure which might exceed 25 REM, for lifesaving activities, must be approved by an Emergency Manager. Although EPA and NRC do not provide specific guidance for the upper bounds for lifesaving exposure, WCGS has chosen to use the following criteria:

1. Emergency Managers shall not knowingly permit an individual's exposure to exceed 25 REM, unless it is for lifesaving activities or protection of large populations. Emergency Managers shall not knowingly permit an individual to enter a high dose area if the projected Total Effective Dose Equivalent (TEDE) is expected to exceed 75 REM.

   - Those individuals designated to exceed 25 REM must be volunteers and be fully aware of the risks involved.

2. Emergency Managers should obtain the advice and concurrence of the Radiological Coordinators in approving additional exposure.

6.3.16 Under emergency conditions, normal exposure controls are maintained. This is ensured by the on-shift Radiation Protection (RP) Technician in the Control Room, the Radiological Coordinators in the TSC and EOF.

6.3.17 The Radiological Coordinator has responsibility for maintaining exposure control for site activities, including establishment of access control at alternate locations. Strict exposure control of individuals passing through the access point is maintained on a 24-hour-per-day basis.

6.3.18 In order to enhance the exposure control process and to provide dosimetry for an expanded number of people, dosimetry vendors are available to expedite shipment of extra dosimetry devices to supplement existing on-site supplies of dosimetry equipment and to supply personnel to assist in on-site appraisal of exposures.

6.3.19 When activated, the Emergency Response Team covers emergency sampling, surveying, analysis, and hazard evaluation.

6.3.20 Personnel, instruments, and equipment are to be monitored at the access control point. Personnel and equipment decontamination is controlled in accordance with WCGS procedures.

6.3.21 WCGS maintains control over the Exclusion Area as necessary, restoring affected on-site areas to acceptable conditions for access.

1. Reentry into affected areas is a controlled evolution. Surveys are performed, environmental samples are obtained and analyzed, and areas posted or decontaminated.

6.3.22 Contamination limits for food supplies and drinking water are based upon the State of Kansas Protective Action Guides.

6.4 Emergency Facilities

6.4.1 Control Room Facilities

1. The Control Room is designed to be habitable under emergency conditions. The Control Room contains controls, instruments, and communications equipment necessary for operation of the plant under both normal and emergency conditions. The ventilation system, shielding, and structures are designed and built to permit continuous occupancy during a postulated design basis accident.

2. Equipment available in the Control Room gives early warning and continuous evaluation of potential emergency situations. Portable radiation survey instruments are readily available within the Control Room.

3. Access to the Control Room is controlled by the Shift Manager.

6.4.2 Technical Support Center Facilities

1. The TSC is a brisk 2 minutes and 15 seconds walk from the Control Room inside the Protected Area. This is sufficiently close to permit face-to-face interaction between personnel in the Control Room and the TSC, should telephone communications become inoperable.

2. The TSC is activated in the event of an Alert or higher emergency. The TSC may be activated during an NUE at the discretion of the Shift Manager.

3. The TSC is designed to the seismic criteria of the Uniform Building Code. It is designed to withstand 100-year-recurrence winds and is located above the probable maximum flood level.

   a. The manually activated single-train, non-seismic Category I TSC ventilation system utilizes high-efficiency particulate air and charcoal filters. The radioiodine monitoring equipment in the TSC provides a designed minimum detectable level of 1.0E-07 uCi/cc radioiodine. A radiation monitor (including the monitor for radioiodines) alarms to alert TSC personnel if radiation levels may affect the habitability of the TSC.

(Step 6.4.2.3. continued on next page)

Step 6.4.2.3. (continued from previous page)

b. Portable radiation monitoring equipment is provided in the TSC for backup radiation monitoring capability.

c. Equipment for Emergency Response Teams is available in the TSC. This equipment includes protective clothing, dosimetry, survey meters and respirators.

d. A diesel generator is available to provide backup power to the TSC. Until the diesel is loaded, batteries are available for Nuclear Plant Information System (NPIS).

e. The TSC is sized to accommodate a minimum of 25 persons and has the same radiological habitability as the Control Room under accident conditions.

4. Personnel in the TSC have access to the following materials:

   o WCGS USAR, Environmental Report, and Technical Specifications

   o Plant operating and emergency procedures

   o WCGS, State, and Coffey County emergency response plans

   o System drawings, schematics, and diagrams

5. An Alternate TSC is located at the EOF. The Alternate TSC would be used in the case of a hostile action or other event impeding site access. The Alternate TSC provides access to the same materials as the primary TSC. The Alternate TSC has the capability to:

   o Communicate with the EOF, Control Room and Security personnel

   o Perform off-site notifications of a plant emergency

   o Perform engineering assessment activities, including damage control team planning and preparation

6.4.3 Operations Support Center

1. The OSC is housed in the TSC and is activated whenever the TSC is activated.

2. The OSC serves as an assembly area for plant personnel immediately serving in emergency repair or Radiation Protection support capacity during an event. The OSC functions include the coordination, formation and dispatch of Emergency Response Teams.

3. The basement of the Security Building has been identified as an alternate location for the OSC function. It contains telephones and a Gai-Tronic call box, which will allow direct communications with the other emergency centers. Portable radios are available to key personnel to further provide communications with other emergency centers.

4. An alternative OSC muster area is included with the Alternate TSC at the EOF. The Alternative OSC muster area would be used in conjunction with the Alternate TSC.

6.4.4 Emergency Operations Facility (EOF)

1. The EOF is located approximately 12 miles north northwest of WCGS, near the junction of I-35 and US-75, and is activated at an Alert or higher emergency. Following facility activation, overall emergency response is managed from the EOF.

   a. This facility serves as a center for evaluation and coordination of environmental activities related to the emergency including radiological assessment and the evaluation of potential or actual radioactive releases from the plant.

2. The EOF is a commercial building that is well engineered for the design life of the plant.

   a. A diesel generator is available to provide backup power to the EOF. Until the diesel is loaded, UPS backup is available for equipment used to access plant data upon loss of AC power.

   b. The EOF is sized to accommodate at least 35 persons.

(Step 6.4.4. continued on next page)

Step 6.4.4. (continued from previous page)

3. Accommodations and telephones are provided for a limited number of County, State and Federal personnel. Facilities are provided for staging field survey efforts from the EOF.

4. The EOF serves as the base of operations for evacuation assessments and for communications with federal, state, and local response organizations. Radio and telephone links are available to the TSC, and Control Room.

5. Personnel in the EOF have access to the following materials:

   o WCGS USAR, Environmental Report, and Technical Specifications

   o Plant operating and emergency procedures

   o WCGS, State, and Coffey County emergency response plans

   o System drawings, schematics, and diagrams

6.4.5 Public Information Facilities

1. The Public Information Facilities include the Joint Information Clearinghouse (JIC), Media Center (MC), and Public Inquiry Room. These facilities may be established as follows:

   a. The JIC and Public Inquiry Room in the Wolf Creek Joint Media Center, at 2718 Lynx Place, Lebo, KS.

   b. The MC in the Wolf Creek Joint Media Center, at 2718 Lynx Place, Lebo, KS.

2. At an NUE, information is provided to the public by Corporate Communications. The Wolf Creek Public Information Facilities may be staffed at any time, as determined by the Wolf Creek Public Information Officer, to support the distribution of information to the public.

3. The Public Information Organization activates at an Alert or higher emergency.

(Step 6.4.5. continued on next page)

Step 6.4.5. (continued from previous page)

4. The JIC, MC, and the Public Inquiry Room are kept in close proximity to each other to facilitate coordination of information in the form of news statements, news conferences or telephone conversations.

   a. Dedicated telephone lines allow contact between the JIC, TSC, and the EOF. The JIC contains status boards, appropriate office supplies, computer(s), printer(s), faxing and photocopy capabilities, and outside telephone lines.

5. The Wolf Creek PIO, the State PIO and Coffey County PIO communicate with the Public Information Coordinator (PIC) to obtain technical information. The PIOs prepare news statements at the JIC and coordinate their efforts.

6. The MC will accommodate media representatives in an auditorium for news conferences. The Media Room is a facility set up to provide the media with a work area, audio/visual material, outside telephone lines and public information status boards.

7. Media Monitoring and Rumor Control functions for WCGS, the State and Coffey County are performed by members of the Public Information Organization in the Public Inquiry Room. Appropriate equipment and supplies are available. Approved news statements and information are transmitted to the Public Inquiry Room after the JIC is activated.

   a. The Media Monitoring Team reports any rumors or misinformation heard or observed from their monitoring of the media to the JIC.

6.4.6 <u>On-Site Medical Facility</u>

1. A medical facility is located in the Clyde Cessna building. This facility is equipped to provide basic medical response capabilities.

2. First aid kits, emergency equipment and supplies are available to ensure that assistance can be provided to injured and/or contaminated personnel.

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Step 6.4.6. (continued from previous page)

3. Shift personnel, trained in first aid, are available on-site 24 hours per day. Priority should be given to treating those with the most urgent medical needs.

4. In the case of contamination, efforts are made to decontaminate injured personnel on-site, as soon as practicable. However, first aid or removal of the individual from a hazardous environment, takes precedence over decontamination efforts. If decontamination is not possible, the victim is covered in such a manner as to avoid any spread of contamination until medical aid can be obtained or hospitalization accomplished.

5. Personnel leaving the RCA are monitored for contamination. All personnel are monitored for contamination before leaving the site.

   a. Personnel may be monitored by portal monitors or friskers when entering or leaving WCGS facilities.

   b. Personnel found to be contaminated must undergo decontamination under the direction of Health Physics personnel using Health Physics supplies and equipment available during routine activities. Release limits for personnel decontamination are found in the Health Physics Manual.

6.4.7 <u>State and County Facilities</u>

1. Coffey County Emergency Operations Center (County EOC) is located in the Coffey County Courthouse, Burlington, KS. The County EOC is a command center for county agencies and a mustering area for personnel who arrive in the WCGS area in response to an emergency. The County EOC is activated at the Alert level with the additional support staff activated upon declaration of an SAE or GE. Other centers are established as the emergency needs dictate.

2. State of Kansas Emergency Operations Center (State EOC) located in the State Defense Building, Topeka, KS, is the command-and-control center for the State.

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Step 6.4.7. (continued from previous page)

3. The State Forward Staging Area is located about 11 miles north of WCGS in the roadside park at the intersection of Old Highway 50 and U.S. 75. When it becomes necessary for the State to dispatch emergency personnel to the plume exposure pathway emergency planning zone (EPZ), the State activates the State Forward Staging Area to serve as a secondary base of operations for state personnel and a local contact point with Coffey County.

6.4.8 Evacuation Registration Center

1. People in the EPZ should evacuate to

* the Lyon County Reception Center located at Neosho Rapids Grade School, 240 N. Commercial St., Neosho Rapids, Kans. Travel north on US Hwy. 75 to I-35. Turn left (West) toward Emporia onto I-35 South. Take exit 141 for KS-130 toward Neosho Rapids/Hartford, travel two and one-half miles to the Neosho Rapids Grade School.

OR

* the Woodson County Reception Center, located at the Woodson County Rural Fire Station, 801 West Mary St., Yates Center, Kans. Travel south on US Hwy.75 to Yates Center. At the intersection of Hwy. 75 and W. Washington Street, turn right (west). Travel approximately two blocks to the Woodson County Rural Fire Station.

6.5 Control Room Organization

6.5.1 The Shift Manager is responsible for the initial evaluation and classification of any abnormal situation and for directing the appropriate response, including initial activation of a callout.

1. Control Room personnel are on shift 24 hours a day. The shift complement is shown in Figure 2, MINIMUM SHIFT STAFFING.

6.5.2 Upon declaration of an emergency, the Shift Manager assumes the duties of Emergency Manager. The Shift Manager normally goes to and remains in the Control Room unless it is necessary for him to leave the Control Room in order to perform specific assessment, corrective, or protective actions. The Shift Manager performs the following actions:

- o Initiate appropriate technical measures to mitigate the event
- o Determine if releases have occurred, make the necessary assessment of the off-site concentration of radioactivity resulting from a release, and evacuate non-essential personnel if necessary
- o Direct the activities of the Control Room Emergency Notification System (ENS)/Off-site Communicator
- o Ensure immediate and follow-up notifications are made which provide sufficient information on emergency classification, plant status, off-site dose projections or measurements, and issue recommendations for off-site protective actions to authorities responsible for off-site emergency measures
- o Ensure NRC Resident Inspector is notified as soon as possible after the State and County are notified
- o Ensure notifications to the NRC are made as soon as possible within 60 minutes of classification of an emergency in accordance with 10CFR50.72(a)(3)
- o Ensure other notifications are made in accordance with EPPs
- o Activate on-site emergency teams if required
- o Notify plant personnel of the change in plant status

6.5.3 ENS/Off-Site Communicator

1. ENS/Off-site Communicator reports to the Shift Manager, performs initial notifications, initiates the Automatic Dialing System (ADS) or Backup ADS to callout the ERO and maintains communications with the NRC.

   a. A manual callout of personnel to staff the ERO is performed if the ADS and Backup ADS are not functioning.

6.5.4 Chemistry Technician

1. The Chemistry Technician reports to the Shift Manager and performs dose assessment until relieved by Dose Assessment personnel in the EOF.

6.5.5 Radiation Protection (RP) Technician

1. The RP Technician reports to the Shift Manager and performs radiation monitoring for personnel sent from and in the Control Room.

6.5.6 Control Room Supervisor

1. Reports to the Shift Manager and provides direction to Reactor Operators and Nuclear Station Operators for the safe operation of the unit.

6.5.7 Reactor Operators

1. The Reactor Operators report to the Control Room Supervisor and perform plant monitoring and reactor manipulations as needed from the Control Room.

6.5.8 Nuclear Station Operators

1. Nuclear Station Operators report to the Control Room Supervisor and perform local plant monitoring and manipulations as directed.

6.5.9 Initial emergency response to the major functional areas is within the capabilities of the minimum operations shift complement.

6.5.10 On-shift staff augmentation is available, when deemed necessary, in accordance with ATTACHMENT D, WCGS MINIMUM STAFFING FOR EMERGENCIES.

6.6 Technical Support Center (TSC) Organization

6.6.1 TSC activation will be performed as soon as practical and within 75 minutes of a declaration of an Alert or higher classification.

6.6.2 The TSC is considered activated when the following positions are present, the Site Emergency Manager determines the facility is ready to activate, and declares the facility activated:

- o Site Emergency Manager
- o TSC Operations Coordinator
- o TSC Administrative Coordinator
- o TSC Radiological Coordinator
- o Maintenance Coordinator

6.6.3 The TSC organization is shown in FIGURE 3, TSC/OSC ORGANIZATION.

6.6.4 Additional personnel to support repair efforts and recovery functions will be added as necessary. Personnel reporting from off-site may initially report to the EOF/Alternate TSC, and then proceed to the TSC as plant/site conditions allow.

6.6.5 Site Emergency Manager

1. The assigned Site Emergency Manager will assume command-and-control functions and will be the top line manager responsible for the emergency. An assigned Site Emergency Manager is available 24 hours a day. The assigned Site Emergency Manager may assume command-and-control functions from the Shift Manager during an NUE if so requested by the Shift Manager.

2. The Shift Manager will transfer the Site Emergency Manager duties to the assigned Site Emergency Manager in accordance with EPPs. The Shift Manager resumes Control Room duties and reports to the Site Emergency Manager.

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Step 6.6.5. (continued from previous page)

3. The Site Emergency Manager directs the on-site emergency effort, implements the applicable EPPs and, as appropriate, performs the following:

   - o Assess and verify the situation and assure that appropriate mitigating efforts are being taken
   - o Review initial event classification and reclassify as appropriate
   - o Determine the necessity for evacuation of personnel on-site
   - o **IF** a release has occurred, **THEN** make the necessary assessment of the off-site concentration of radioactivity resulting from a release
   - o Ensure immediate and follow-up notifications are made which provide sufficient information on emergency classification, plant status, off-site dose projections or measurements, and issue recommendations for off-site protective actions to authorities responsible for off-site emergency measures

4. The following responsibilities are those of the Emergency Managers and may not be delegated. These responsibilities may be divided between the Site and Off-Site Emergency Managers:

   - o Classification of the emergency
   - o Protective action recommendations
   - o Authorization for notification of off-site authorities
   - o Authorization for emergency exposure in excess of 10 CFR 20 limits

6.6.6 TSC Operations Coordinator

1. The TSC Operations Coordinator reports to the Site Emergency Manager and is responsible for the following:

   o Supervise reactor plant operations, which includes the Operations Recorder, Engineering Coordinator, Engineering Team and ENS Communicator.

   o Keep the Site Emergency Manager advised of plant conditions and operational manipulations.

2. The TSC Operations Coordinator may supervise other positions as directed by WCGS procedures.

6.6.7 Engineering Coordinator

1. The Engineering Coordinator reports to the TSC Operations Coordinator and directs the activities of the Engineering Team to technically assess plant status and the severity of emergency conditions.

6.6.8 Engineering Team

1. The Engineering Team reports to the Engineering Coordinator. The Team evaluates current and historical plant parameters, assesses the severity of the emergency conditions and magnitude of fuel damage, and recommends corrective or preventive actions.

6.6.9 TSC Emergency Notification System (ENS) Communicator

1. The TSC ENS Communicator reports to the TSC Operations Coordinator and maintains communications with the NRC.

6.6.10 TSC Radiological Coordinator

1. The TSC Radiological Coordinator reports to the Site Emergency Manager and is responsible for preventing or minimizing direct exposure to, or ingestion/inhalation of, radioactive materials during a radiological emergency. Responsibilities are as follows:

   o Monitoring dose rates and dose projections

   o Monitoring radiological survey teams' results

   o Assists the Site Emergency Manager in the formulation of recommended protective actions

   o Monitoring personnel radiation exposures to ensure they are maintained in accordance with 10CFR 20 limits unless otherwise authorized by the Emergency Manager

   o Provides radiological data and concerns to plant teams for the team briefs

   o Authorizing and supervising Off-site Monitoring Teams until the EOF is staffed

2. The TSC Radiological Coordinator will transfer off-site duties to the EOF when the EOF is activated

6.6.11 TSC Administrative Coordinator

1. The TSC Administrative Coordinator reports to and assists the Site Emergency Manager to ensure that emergency notifications are performed. The TSC Administrative Coordinator is responsible for logistical support in the areas of TSC personnel, Control Room, procurement and warehouse support, communications support and equipment repair services.

2. After EOF activation, the TSC Administrative Coordinator directs requests for logistical support beyond on-site staff capabilities to the EOF Administrative Coordinator.

6.6.12 TSC Team Director

1. The TSC Team Director reports to the TSC Maintenance Coordinator and provides advice on all matters concerning Emergency Response Team activities.

6.6.13 Maintenance Coordinator

1. The Maintenance Coordinator reports to the Site Emergency Manager and directs the Maintenance Assistant in the coordination of emergency team activities. The Maintenance Coordinator also directs the formation of teams to be assigned to search and rescue.

6.6.14 Operations Communicator

1. Provides data, progress and plant conditions from the Control Room via the Operations Recorders.

6.6.15 Additional Personnel

1. The following are examples of positions that are not needed for activation and operation of the TSC but supplement those personnel which are essential to an emergency response:

   - Operations Recorder maintains the Operations Status Board current.

   - Team Communicator reports to the Team Director and is responsible for communicating with On-site Teams.

   - Emergency Response Team Members perform tasks as assigned by the Maintenance Assistant.

   - Administrative Assistants perform facility accountability, assist the Emergency Manager, faxing and copying, log keeping, and communications as directed.

   - Security Coordinator maintains a line of communications between the TSC and Security to cover security concerns.

6.7 Operations Support Center (OSC) Organization

6.7.1 Maintenance Assistant

1. The Maintenance Assistant reports to the Maintenance Coordinator and coordinates emergency repair and damage control activities, coordinates deployment of on-site teams, and coordinates the activities of the Maintenance Planners.

6.7.2 Emergency Response Team (ERT)

1. The ERT personnel may be selected from Radiation Protection Technicians, Chemistry Technicians, and Instrumentation and Control, Mechanical, or Electrical Maintenance. The ERT reports to the Maintenance Assistant and is responsible for repairs, surveys, sampling, analysis, and search and rescue.

6.7.3 Additional Personnel

1. The following are examples of positions that are not needed for activation and operation of the OSC but supplement those personnel which are essential to an emergency response.

   - Chemistry Technicians perform emergency chemical sampling and provide post-accident sample analysis.

   - The Maintenance Planner develops repair plans for use by the emergency repair and damage control teams and assists in locating and securing parts and equipment from the warehouse.

6.8 Emergency Operations Facility (EOF) Organization

6.8.1 EOF activation will be performed as soon as practical and within a goal of 90 minutes of a declaration of an Alert or higher Emergency.

1. The EOF is considered activated when the following positions are present, the Off-site Emergency Manager determines facility readiness, and declares the facility activated:

   - Off-Site Emergency Manager

   - EOF Operations Coordinator

   - EOF Administrative Coordinator

   - EOF Radiological Coordinator

2. The complete EOF organization is shown in FIGURE 4, EOF ORGANIZATION.

6.8.2 Off-Site Emergency Manager

1. The Off-Site Emergency Manager will assume the command-and-control functions and direct the emergency from EOF. An assigned Off-Site Emergency Manager is available 24 hours a day.

2. The Off-Site Emergency Manager is the official WCGS interface with government authorities. The Manager may discuss events in progress with the County and State personnel present in the EOF when making decisions concerning the emergency. Responsibilities include the following:

   a. Supports and provides resources or performs tasks as requested by the Site Emergency Manager

   b. Directs all WCGS personnel in the EOF

   c. Obtains personnel and coordinates the efforts of the following:

      o Emergency response personnel who perform off-site radiological surveys, plus any other personnel deemed useful for the emergency response effort

      o Outside contractors and vendors, such as consultants, laboratories under contract, the Nuclear Steam Supply System (NSSS) vendor, the Architect/Engineer, and regional utilities

      o Additional technical resources may be called in during the emergency for further support or shift assignment on-site.

   d. Coordinates with the Administrative Coordinator in the logistics effort to supply the plant with the necessary personnel and equipment

   e. Briefs WCGS Executive Management on matters related to the emergency

   f. Coordinates with the Off-Site Public Information Coordinator (PIC) in providing technical input for news statements

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Step 6.8.2.2. (continued from previous page)

g. Ensure immediate and follow-up notifications are made which provide sufficient information on emergency classification, plant status, off-site dose projections or measurements, and issue protective actions recommendations to off-site authorities responsible for off-site emergency measures

h. Requests federal assistance through state officials per the State Plan

3. The following responsibilities are those of the Emergency Managers and may not be delegated. These responsibilities may be divided between the Site and Off-Site Emergency Managers:

- o Emergency classification
- o Protective action recommendations
- o Authorization for notification of off-site authorities
- o Authorization of emergency exposure in excess of 10CFR 20

6.8.3 <u>EOF Radiological Coordinator</u>

1. The EOF Radiological Coordinator reports to the Off-Site Emergency Manager and is responsible for radiological monitoring and dose assessment activities off-site. Responsibilities are as follows:

- o Directs and coordinates activities of the Dose Assessment Coordinator and staff
- o Assists the Off-Site Emergency Manager in the formulation of recommended protective actions
- o Provides the PIC with an assessment of radiological conditions
- o Requests through the EOF Administrative Coordinator additional radiation monitoring equipment, instrumentation and Radiation Protection support personnel as necessary
- o Interfaces with State and County emergency response personnel who are assigned to the EOF regarding matters related to off-site radiological assessment

6.8.4 EOF Team Director

1. The EOF Team Director assumes responsibility for authorizing and supervising Off-Site Monitoring Teams. The EOF Team Director directs Emergency Response Teams and advises the EOF Radiological Coordinator on radiological conditions encountered by the Teams.

   a. Off-Site Monitoring Team authorization should be made promptly upon activation of the EOF.

   b. Monitoring teams are specially trained in field sampling techniques. Each team will be equipped with equipment capable of detecting and measuring radioiodine concentrations in the air at levels as low as 10-7 uCi/cc.

   c. County and State personnel may become part of the ERTs to form joint teams to perform off-site monitoring under the direction of a unified team control in accordance with EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL.

6.8.5 Dose Assessment Coordinator

1. Reports to the EOF Radiological Coordinator and is responsible for providing completed off-site dose projections and protective action recommendations.

2. Ensures the Radiological Status Board is maintained current.

6.8.6 HPN Communicator

1. The HPN Communicator reports to the EOF Radiological Coordinator and maintains communications with the NRC via the Health Physics Network (HPN) telephone.

6.8.7 EOF Operations Coordinator

1. Reports to and briefs the Emergency Manager on plant conditions and mitigative strategies.

6.8.8 EOF Administrative Coordinator

1. The Administrative Coordinator is responsible for coordinating, directing, and responding to requests from the ERO for administrative and logistical support. The techniques and procedures used during this effort are adapted from normal WCGS procurement practices. The Administrative Coordinator also ensures notifications to off-site authorities are made.

6.8.9 Representative At County

1. The Representative at the County is located in the County Emergency Operations Center in Burlington, KS, and reports to the Off-Site Emergency Manager. The Representative responds to requests from County personnel for clarification or verification of data received from the TSC or EOF.

6.8.10 Additional Personnel

1. The following are examples of positions that are not needed for activation and operation of the EOF but supplement those personnel which are essential to an emergency response.

   - Assistant Radiological Coordinator assists the Radiological Coordinator and interacts with KDHE staff to ensure necessary information is available

   - Team Communicator communicates with Off-Site Monitoring Teams

   - Operations Recorder maintains the Operations Status Board current

   - Administrative Assistants assist the Emergency Manager, perform faxing and copying, log keeping, and Off-site notifications and communications as directed

6.9 Public Information Organization

6.9.1 The Public Information Organization is activated at an Alert or higher emergency declaration. Information released to the public during an NUE will be provided by Corporate Communications. If deemed necessary, the Wolf Creek Joint Media Center facilities may be staffed to assist in releasing news statements during an NUE.

6.9.2 Wolf Creek Public Information Officer (WC PIO)

1. The WC PIO is the public voice for plant information. The WC PIO is responsible for ensuring the timely issuance of accurate information to the public and media during an emergency at WCGS. Public interaction may be as a formal news conference or a telephone call.

   a. The WC PIO coordinates with the County and State for information to be released to the public.

2. The WC PIO has overall responsibility for the Public Information Organization.

6.9.3 Wolf Creek Public Information Manager (WC PIM)

1. The WC PIM is located in the JIC and reports to the WC PIO. The WC PIM works closely with the WC PIO, Off-Site PIC, News Writer, and Technical Support positions to ensure that information provided the public is timely and accurate.

2. The WC PIM has responsibility for ensuring the Public Information Organization is activated and functions as directed in EPPs.

3. During a declared emergency the WC PIM determines and coordinates the activation of the Joint Information Clearinghouse, Media Center, and Public Inquiry Room. The WC PIM operates from the Wolf Creek Joint Media Center JIC.

4. The complete Public Information organization is shown in FIGURE 5, PUBLIC INFORMATION ORGANIZATION.

6.9.4 Off-Site Public Information Coordinator (PIC)

1. The Off-Site PIC is located in the EOF and reports to the WC PIM. The Off-site PIC gathers and transmits information related to the health and safety of the public to the Joint Information Clearinghouse for use in news statements.

6.9.5 Media Center Manager (MC Manager)

1. The MC Manager is located at the Media Center and reports to the WC PIM. Responsibilities include set-up of the Media Center, leadership for the Media Registrar, AV Support, and management of the media news conferences.

2. Responsibilities include managing the media crowd at the Media Center and assisting with media registration and facility orientation, providing general Wolf Creek background information or approved emergency-related information, arranging individual interviews, and announcing and coordinating scheduled news conferences.

3. The Media Center Manager maintains contact with the Joint Information Clearinghouse to provide news conference schedules.

6.9.6 News Writer

1. The News Writer reports to and provides support for the WC PIM. The News Writer provides support to the PIO including: answering telephones, writing and distributing news statements. The News Writer maintains a chronological log of the events and news statements.

6.9.7 Phone Team Manager

1. The Phone Team Manager reports to the WC PIM and coordinates the rumor control activities of the Phone Team.

6.9.8 Technical Support

1. Technical Support discusses technical details of the news statement with EOF staff to ensure accuracy, updates the status log, maintains the media status board and provides technical interpretation for the Wolf Creek, Coffey County, and State of Kansas Public Information Officers. Technical Support gathers information from the Emergency Facilities to communicate plant, health and safety issues to the public.

6.9.9 Representative at the State

1. The Representative at the State is located in the State of Kansas Emergency Operations Center in Topeka, KS, and reports to the WC PIO. The Representative responds to requests from State personnel for clarification or verification of information pertaining to Wolf Creek.

6.9.10 Additional Personnel

1. The following are examples of additional personnel used to fill ERO positions such as clerical, log keeping, or status board posting. Staffing of these positions does not affect the activation of the facility.

   - Media Center Registrar monitors access to the Media Center, records news conference attendance, provides media packets, provides directions for telephone use and work space information to the media representatives.

   - Audio/Visual Support records news conferences presented in the Media Center.

   - Information Messenger performs clerical and administrative duties at the direction of the Public Information Manager.

   - The Phone Team may make initial media notifications at PIO discretion, addresses media and public questions to the extent possible and reports rumors or misinformation to the Phone Team Manager.

   - The Media Monitoring Team notifies the Phone Team Manager of any rumors or misinformation heard or observed from their monitoring of the media.

6.10 Local Off-Site Organizations

6.10.1 The Coffey County Contingency Plan for Incidents Involving Commercial Nuclear Power describes the authorities, responsibilities, and agreements to which various county agencies are a party in their response to emergencies at WCGS. Information is provided therein about the various agencies' interrelationships and support roles provided to WCGS.

- o The updated evacuation time estimate (ETE) report contains the evacuation times for each subzone. (Reference 3.1.12)

6.10.2 Coffey County Commissioners

1. The Coffey County Board of Commissioners maintains the executive authority and responsibility for planning and coordinating the county response. They have delegated responsibilities and tasks to the local support agencies and have established operating procedures.

2. After declaring a State of Local Disaster Emergency, the Chairman of the Coffey County Commissioners is responsible for making the decision to activate the alert and notification system. Emergency authority, as stated in County Plan, is given in an established line of succession.

3. If a State of Local Disaster Emergency has not been declared, after receipt of notification and in accordance with the County Plan, the Chairman decides which protective actions would be appropriate.

   - o When a protective action decision is made, the County will activate the alert and notification system.

6.10.3 Coffey County Sheriff's Office

1. The Coffey County Sheriff's Office provides local notification, access control, and law enforcement support in accordance with the Coffey County Plan.

(Step 6.10.3. continued on next page)

Step 6.10.3. (continued from previous page)

2. If time does not permit, or if he/she is unable to contact the Chairman or other members of the County Emergency Response Organization, the County Sheriff has the authority to make protective action decisions based upon recommendations by WCGS.

3. Specific services provided by the Coffey County Sheriff's Office include:

   - o Perform notifications as defined within the County Plan and associated implementing procedures
   - o Provide a 24 hour per day manning of communications links between the County and WCGS, and between the County and State
   - o Implement off-site protective actions as necessary and as specified in the County Plan implementing procedures
   - o Initiate warning and initial notification of the population
   - o Direct the evacuation of specific subzones of the EPZ upon the decision to evacuate
   - o Provide traffic control and roadblocks per implementing procedures
   - o Obtain additional assistance as necessary to secure the evacuated areas
   - o Control access to the County EOC

6.10.4 <u>Coffey County Fire District #1 (CCFD)</u>

1. Contractual arrangements have been made with the Board of Trustees of Fire District No. 1, Coffey County, KS, for the provision of fire fighting support. Services contracted are summarized in the Letter of Agreement and maintained in an Emergency Planning file.

2. The WCGS Fire Brigade Leader is also responsible for directing all fire fighting activities on site. Once on site, Fire District members and equipment shall be escorted by Security.

6.10.5 Off-Site Medical Treatment

1. Coffey County Hospital and Newman Regional Health have emergency procedures to provide guidance in the rendering of medical treatment to contaminated patients.

2. Coffey County Hospital, located in Burlington, KS, approximately 9 road miles from the WCGS site, has agreed to provide aid to personnel who are injured or ill and also potentially contaminated.

3. Newman Regional Health serves as a backup to Coffey County Hospital and is located in Emporia, KS, approximately 40 miles from WCGS.

4. Contaminated injured or ill personnel transported from WCGS to off-site medical facilities are attended by personnel trained in radiological practices. Once the patient(s) has been stabilized, WCGS personnel survey patient(s), attending personnel, vehicles, and equipment to ensure they have been decontaminated in accordance with WCGS, County, or State procedures.

6.10.6 Coffey County Emergency Medical Service (EMS)

1. Coffey County EMS provides response, treatment and transportation for personnel who are injured or ill and also potentially contaminated. This assistance is requested by calling 911.

2. If conditions warrant, any vehicle at WCGS may be used to transport affected personnel.

6.10.7 Radiological Emergency Assistance Center/Training Site (REAC/TS)

1. REAC/TS maintains a 24 hour Hospital Disaster Network. Consultation is available for medical emergencies involving radiologically contaminated patients.

6.11 State Organizations

6.11.1 The Governor, by law, is the Chief Executive Officer of the State of Kansas and is responsible for the safety and well-being of all citizens within the State. The State Plan describes the responsibilities of local, federal, state, and volunteer agencies during nuclear emergencies. Upon declaration of a State of Disaster Emergency the State has primary responsibility for responding to an off-site nuclear emergency. Activation of the State EOC, located in the lower level of the State Defense Building, Topeka, KS, is the responsibility of the Governor or authorized representatives, depending on the nature of the emergency. The Kansas Division of Emergency Management provides overall coordination as the responding state agency during a Fixed Nuclear Facilities Incident.

6.11.2 The State of Kansas Radiological Emergency Response Plan for Nuclear Facilities describes in detail, the authorities, responsibilities, and agreements to which various state agencies of their response to emergencies at WCGS. Reference to this document is made for detailed information on each agency's interrelation and support role provided to WCGS.

1. Upon declaration of an SAE or GE representatives of Kansas Division of Emergency Management (KDEM) and Kansas Department of Health and Environment (KDHE) go to the EOF. They act as the interface between WCGS, the County, and the State.

6.11.3 Kansas Division of Emergency Management (KDEM)

1. The KDEM provides the following assistance:

   a. Evaluates information presented by WCGS to decide off-site protective actions

   b. Coordinates nuclear incident response planning, training, and notification. Activities include:

      - Notification of KDHE
      - Notification of Key federal and state agencies
      - Notification of the Governor's Office
      - Provides radiological monitoring coordination
      - Requests federal assistance and coordinates federal and state support on behalf of affected areas
      - Provides 24 hour per day point of contact to receive notification
      - Activates the State EOC

6.11.4 Kansas Department of Health and Environment (KDHE)

1. The KDHE provides assistance as described below:

   - o Acts as the lead state agency for radiological emergency response
   - o Conducts radiological monitoring in affected areas
   - o Provides radiological advice to hospitals
   - o Develops State PAGs
   - o Provides information to the public about protective actions, via KDEM
   - o Determines off-site contamination levels of the environment
   - o Provides technical guidance and coordination in recovery activities
   - o Supports the development and conduct of radiological response training
   - o Reviews, evaluates, and maintains dosimetry records for non-licensee emergency workers and other affected individuals

6.11.5 Kansas Highway Patrol (KHP)

1. The KHP provides communications and notification support including backup notification means for the following:

   - o Coffey County Sheriff's Office
   - o KDEM, Technological Hazards Section
   - o The Governor's Office

2. The KHP augments local law enforcement in securing the area and establishing evacuation routes and providing traffic control.

3. The KHP provides self-support radiological monitoring.

4. The KHP maintains emergency communications systems 24 hours per day.

6.11.6 Kansas National Guard

1. The Kansas National Guard may be directed by the Governor to provide assistance as needed such as the following:

   - o Evacuation of communities
   - o Area security
   - o Media Center Security

6.11.7 Kansas Department of Transportation (KDOT)

1. KDOT provides assistance as follows:

   - o Provides emergency traffic barriers and signs
   - o Supplements emergency traffic control
   - o Supplies construction equipment
   - o Provides communications support

6.12 Federal Organizations

6.12.1 Should an emergency situation or accident occur at WCGS, notification and reports must be made to various federal agencies and organizations, and requests for assistance may also be made.

6.12.2 Federal Emergency Management Agency (FEMA)

1. FEMA is the lead agency supporting implementation of the state and local emergency plans. Region VII FEMA response time is estimated to be four hours.

6.12.3 Department of Energy (DOE)

1. The DOE Radiological Assistance Program provides monitoring assistance and radiological consultation to the KDHE. The DOE provides assistance under the Nuclear/Radiological Incident Annex to the National Response Framework and responds to authorized requests for assistance by the KDHE. It is expected that initial responders, to assist with off-site radiological monitoring, will arrive within 8 hours.

6.12.4 Nuclear Regulatory Commission (NRC)

1. The NRC provides advice to other federal, state, and local agencies on the radiological health consequences of various emergency protective actions. The NRC requires notification and reports as indicated in ATTACHMENT H, REPORTING OF INCIDENTS PER 10CFR20 and as specified in the WCGS Technical Specifications. NRC Region IV response time is estimated to be 12 hours.

6.12.5 Licensee resources available to support the federal response include the following:

- Space and equipment in the TSC and EOF provided for key federal personnel
- Telecommunications equipment at these centers is available to federal personnel for use
- Parking space adjacent to the EOF provides an area for the location of federal response vehicles, with power and sanitary services available at the EOF
- Open fields west of the parking lot at the EOF provide access for helicopters
- Coffey County Airport is available for air traffic

6.12.6 Federal Radiological Monitoring and Assessment Center (FRMAC)

1. FRMAC is a federal asset available on request by the Department of Homeland Security (DHS) and state and local agencies to respond to a nuclear or radiological incident. The FRMAC is an interagency organization with representation from the NNSA, the Department of Defense (DOD), the Environmental Protection Agency (EPA), the Department of Health and Human Services (HHS), Federal Bureau of Investigations (FBI), and other federal agencies. Full Federal response (FRMAC) is expected within 48 hours.

6.13 Additional Support Agencies

6.13.1 Vendor and Architect/Engineers (A/E)

1. NSSS supplier, Westinghouse, is the chief vendor who may be involved with emergency response for WCGS. Westinghouse has emergency response plans which are activated upon notice and is expected to provide the following services:

   - o Personnel with expertise in various areas
   - o Technical analysis
   - o Operational analysis
   - o Accident/transient analysis
   - o Recommendations

6.13.2 Regional Utility Support

1. WCGS shares the Standardized Nuclear Unit Power Plant System (SNUPPS) power-block design with the Union Electric Callaway Plant. Because of this design concept and similarity with the WCGS layout, assistance from Union Electric is possible. A specific mutual aid agreement between WCGS and Callaway Energy Center, Ameren Missouri d/b/a Union Electric has been established. While this assistance may be available within a short period of time, it shows greatest promise in the case of a prolonged emergency where extended, around the clock coverage is required. The Site Emergency Manager may authorize the temporary use of this resource, should staff augmentation be necessary. Union Electric Company is a signatory of the INPO FIXED FACILITY EMERGENCY RESPONSE VOLUNTARY ASSISTANCE AGREEMENT.

6.13.3 Institute of Nuclear Power Operations (INPO)

1. WCGS has signed the INPO FIXED FACILITY EMERGENCY RESPONSE VOLUNTARY ASSISTANCE AGREEMENT. This agreement is by and among electric utilities which have responsibility for the construction and operation of commercial U.S. nuclear power plants. Assistance may be requested from any of the signatory companies in the form of technical and administrative aid or personnel, facility, or equipment resources. Requested assistance is rendered according to the agreement.

6.13.4 American Nuclear Insurers (ANI)

1. ANI is notified at emergency classifications of Alert or higher. ANI is available to provide insurance services as necessary.

6.14 Plant Monitoring

6.14.1 Nuclear Plant Information System (NPIS)

1. The integration and display of selected and critical data is performed by NPIS which is a non-safety, non-Class 1E system. Isolation is provided to ensure that NPIS does not degrade the performance of safety system equipment or displays.

2. NPIS provides data storage and recall capability.

3. Certain parameters are also transmitted to the NRC Operations Center via the Emergency Response Data System (ERDS) link of NPIS. ERDS is activated through NPIS within 60 minutes of an Alert or higher classification.

4. The NPIS computer feeds key plant parameters to individual terminals in the Control Room, TSC, and via *RTime Viewer to the EOF which display data identical in accuracy, resolution, and reliability. Support personnel may assist the Control Room staff to analyze and diagnose plant abnormalities so that mitigative action may be taken and then monitored.

(Step 6.14.1. continued on next page)

Step 6.14.1. (continued from previous page)

5. The Safety Parameter Display System (SPDS) provides for continuous indication of plant parameters or derived variables representative of the safety status of the plant. The primary function of the SPDS is to aid the user in the rapid detection of abnormal operating conditions. As a plant safety information and diagnostic tool, SPDS concentrates on a minimum set of plant parameters from which the plant safety status can be assessed.

6.14.2 On-Site Radiological Monitors

1. Process monitors monitor the radiation intensity of materials within plant systems. These monitors continuously measure, indicate and record the radioactive material concentrations located within systems being monitored. Each monitor includes an adjustable alarm to provide indication of a significant change or the existence of a concentration of radioactive material above pre-selected values. The USAR, Chapter 11.5, includes a listing and range of plant monitors.

2. The Area Radiation Monitoring System monitors provide information about radiation intensity at specific plant locations. These monitors provide the following:

   a. Warnings of excessive gamma radiation levels in areas where nuclear fuel is stored or handled

   b. Control Room personnel with a continuous indication of gamma radiation levels at selected locations within the various plant buildings

   c. Assistance in detecting unauthorized or inadvertent movement of radioactive material in the plant, including the radwaste area

   d. Supplementation of other systems, such as process radiation monitoring or leak detection, in detecting abnormal migrations of radioactive material

   e. Local alarms to warn personnel in the area

(Step 6.14.2. continued on next page)

Step 6.14.2. (continued from previous page)

3. Effluent monitors provide information about the concentration of radioactive material in plant effluent pathways. Each significant effluent pathway from the plant includes an effluent monitor to enable the quantification of the radioactive material concentration exiting the plant.

6.14.3 Meteorological Monitoring System

1. The Meteorological Monitoring System is composed of a 90-meter instrument tower and a temperature controlled shelter at the base of the tower housing associated instrumentation and equipment.

2. The function of the meteorological system is to monitor and record meteorological conditions.

3. Information provided by instruments at the meteorological tower is available from the NPIS computer system.

4. Time interval measurements are used in calculating 15-minute averages for all parameters.

5. When needed, Meteorological data can be obtained from the National Weather Service.

6.14.4 Seismic Monitoring System

1. The seismic warning panel in the Control Room provides local visual and audible indication when a seismic event has occurred.

6.14.5 Hydrologic Monitoring

1. Hydrologic monitoring is not required as WCGS is a "dry site" as defined by Regulatory Guide 1.102. The plant site is located above the design basis flood level.

6.14.6 Fire Protection

1. WCGS is protected by an independent fire protection system consisting of two subsystems, a detection/alarm system and a suppression system.

(Step 6.14.6. continued on next page)

Step 6.14.6. (continued from previous page)

2. Activation of the fire systems results in an audible alarm throughout the plant. Alarms are also displayed in the Control Room.

6.14.7 Laboratory Facilities

1. A radiochemistry (hot) laboratory, radwaste laboratory, and turbine building chemistry laboratory are located in the power block. The chemistry shop laboratory is located in the Walter P. Chrysler Building. Further information on on-site laboratory equipment can be found in USAR, Chapter 12.5.

2. The chemistry shop laboratory on site may be used for processing of routine and emergency field samples. The Kansas Health And Environmental Laboratory in Topeka, KS, or alternate facility is available to further augment the processing of emergency samples.

3. Private laboratories under contract to WCGS or laboratories of neighboring utilities who are signatories of the INPO Voluntary Assistance Agreement may be considered for use.

6.15 Emergency Supplies

6.15.1 Emergency supplies include protective, communications, and radiological monitoring equipment, check sources, and other supplies. The EPPs list emergency supplies and their locations.

6.15.2 Emergency supplies are maintained, inventoried, and inspected on a quarterly basis in accordance with EPPs. The EPPs contain an inventory list of WCGS equipment for emergency supplies. This equipment may be augmented by other on-site equipment.

6.15.3 Instruments are calibrated in accordance with WCGS Radiation Protection Procedures. For any items removed from the emergency supplies for calibration or repair, an operable equivalent instrument is used to replace it. Sufficient quantities of spare instruments/equipment are on site to provide replacements.

6.16 Communications

6.16.1 Communication Equipment

1. Telephones provide primary communications contact with the State and County EOCs. The on-site system in the Olive Beech Building and the off-site system in EOF are powered by their own battery and charger. The battery will supply the system if the charger fails.

   a. The Emergency Telecommunications System (ETS) is used for NRC communications.

   b. Trunk lines are available for communications with outside agencies.

   c. Cell phones or other comparable equipment are used as a backup means of communications with joint radiological monitoring teams.

2. Radio communications provide backup communications with the State and County EOCs. Fixed AC-powered transmitter/receiver units and a number of portable and hand-held units are also capable of providing fixed and mobile communications to joint radiological monitoring teams.

   a. Radio communication is the primary communication method for the joint radiological monitoring teams.

3. A paging system is used for initial notification of key personnel. Pager coverage is provided in and around the cities of Burlington, Emporia, Topeka, Ottawa and Lawrence.

6.16.2 Communication Dissemination

1. The methods of employee communications may be employee meetings, announcements, or literature handouts.

2. The Public Information Organization is responsible for interfacing with the media. Communication between WCGS and media organizations are performed in accordance with EPPs.

(Step 6.16.2. continued on next page)

Step 6.16.2. (continued from previous page)

3. Annually, WCGS offers the news media with the following information:

   o Information concerning the emergency plan

   o Information concerning radiation

   o Facilities available for media

   o Points of contact for statements of public information

   o Differences between normal and emergency plant operations

4. WCGS, state, and local emergency organizations provide members of the public, including transients, public education information on how they are notified and what their initial actions should be during an emergency.

   a. Emergency planning information is provided within local telephone directories. The information, developed jointly by WCGS, Coffey County and the State of Kansas, is distributed to residences of the EPZ.

   b. Information includes educational facts on radiation, protective measures, special needs of the handicapped and the points of contact for additional information.

5. Emergency planning information, displayed on information boards, is provided for transients in the public use areas of John Redmond Reservoir (JRR), Coffey County Lake (CCL), and other WCGS controlled areas. Transients have access to emergency plan information within motel rooms and telephone books.

6.17 <u>Emergency Plan Training</u>

6.17.1 WCGS has developed an emergency preparedness training program which meets the requirements of 10CFR50, Appendix E, Section IV. F.

6.17.2 The Manager Emergency Planning ensures required training is provided for ERO personnel in accordance with plant procedures.

6.17.3 The Manager Emergency Planning ensures corrective actions for any Emergency Planning weakness or deficiencies identified are initiated and corrected using the WCGS corrective action process.

6.17.4 Personnel receive general RERP training as a portion of Plant Access Training prior to receiving unescorted access to WCGS.

6.17.5 Initial and re-qualification training is provided for personnel on the ERO. This training may be in the form of self study, class room training, drills, tabletops, or any combination of these.

1. Position specific training is provided for personnel filling positions in the following areas:

   - o Managers/Coordinators of the emergency
   - o Personnel responsible for accident assessment
   - o Radiological monitoring teams
   - o Fire brigade members
   - o Emergency response teams
   - o Medical support personnel
   - o Security personnel
   - o Support personnel

2. Critiques are performed and end of course feedback solicited after each training class to identify weak or deficient areas.

6.17.6 Where Letters of Agreement exist between WCGS and local agencies and for each off-site response organization's emergency support role, training is offered annually. Training is also offered to the participants in the Interlocal Agreement between Coffey County and host county Lyon.

1. This training consists of an orientation to plant operations and site access procedures, basic radiation protection and monitoring information, procedures for notification, an overview of the ERO duties and activities, and training materials associated with performance of their expected roles.

6.17.7 Drills are considered part of the Emergency Plan Training Program. Periodic drills conducted between the biennial exercise ensure that the ERO is capable of executing the principal functional areas of emergency response including activities such as management and coordination of emergency response, accident assessment, event classification, notification of off-site authorities, assessment of the on-site and off-site impact of radiological releases, protective action decision making, plant system repair and mitigative action implementation.

1. State and County participation in drills will be allowed if they so desire.

6.18 <u>Emergency Plan Drills</u>

6.18.1 Annual communication drills between WCGS, State and County EOCs, and field assessment teams ensure that contact can be made and that messages are comprehended.

1. Monthly communication tests verify communications with the local County and State authorities. Communications tests are made with the NRC Headquarters via the Emergency Telecommunications System (ETS). These tests are performed in accordance with EPPs.

6.18.2 Fire drills are conducted in accordance with plant administrative procedures.

6.18.3 Annual medical emergency drills include transportation and treatment of simulated contaminated individuals by off-site medical treatment facilities.

6.18.4 Annual radiological monitoring drills include collection and analysis of sample media, field activities, and provisions for communications and record keeping.

6.18.5 Semi-annual Health Physics drills involve response to and analysis of simulated elevated airborne and liquid samples and direct radiation measurements in the environment.

6.18.6 Each calendar quarter, a callout drill is conducted to verify the operability of the notification system.

6.18.7 Critiques are conducted following each drill to identify and correct noted weaknesses and deficiencies.

6.18.8 Terrorist-based-event drills will be conducted as directed by FEMA and the NRC. **[Commitment Step 3.2.2]**

6.19 Emergency Planning Exercises

6.19.1 In accordance with 10CFR50 Appendix E, Section IV.F, emergency exercises will test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communication networks, test the public notification system, and ensure that ERO personnel are familiar with their duties.

6.19.2 Exercises will be conducted biennially to test the on-site and off-site emergency plans. Exercises ensure that the ERO is capable of executing the principal functional areas of emergency response including activities such as management and coordination of emergency response, accident assessment, event classification, notification of off-site authorities, assessment of the on-site and off-site impact of radiological releases, protective action decision making, plant system repair and mitigative action implementation.

6.19.3 To meet NRC and FEMA requirements, the exercises are varied so as to test, at least once every eight years, all major components of the WCGS, State, and County plans and response organizations. The State and County actively participate in these exercises.

6.19.4 Each scenario variation shall be demonstrated at least once during the eight year exercise cycle and shall include, but not be limited to, the following:

1. Exercises should be conducted under various weather conditions.

2. Hostile action directed at the plant site involving the integration of off-site resources with on-site response.

3. An initial classification of or rapid escalation to a Site Area Emergency or General Emergency.

4. No radiological release or an unplanned minimal radiological release that requires the site to declare a Site Area Emergency, but does not require declaration of a General Emergency.

(Step 6.19.4. continued on next page)

Step 6.19.4. (continued from previous page)

5. Implementation of strategies, procedures and guidance developed under 10 CFR 50.155(b)(2).

6. Start a drill or exercise between 6:00 p.m. and 4:00 a.m. Some drills or exercises should be unannounced.

7. Large radiological release requiring ingestion pathway protective actions beyond the 10 mile EPZ.

6.19.5 Terrorist-based-event exercises will be conducted as directed by FEMA and the NRC. **[Commitment Step 3.2.2]**

6.19.6 Designated observers from federal, state, local governments, and WCGS observe the required exercises. Certain of these observers also evaluate the exercise.

1. The Manager Emergency Planning has the lead responsibility for ensuring corrective actions associated with emergency planning are initiated.

2. Critiques are conducted following each exercise to identify and correct noted weaknesses and deficiencies.

6.19.7 Prior to an exercise a scenario package is prepared which contains the following:

- o Basic objective of each exercise and appropriate evaluation criteria that support demonstration of key skills in principle functional areas
- o Simulated events
- o Dates, time periods, places, and participating organizations
- o Time schedule of all initiating events
- o Descriptive scenario addressing the conduct of the exercise which should include public information activities, off-site fire department assistance, simulated casualties, rescue of personnel, use of protective clothing and radiological monitoring teams
- o Description of the arrangements for, and advance materials to be provided to official observers

6.19.8 Records of exercises conducted during the eight year cycle shall be maintained that document the content of scenarios used to comply with scenario variation requirements.

6.19.9 The exercise scenario shall be submitted to the NRC under 10 CFR 50.4 at least 60 days prior to the evaluated exercise.

6.19.10 Remedial exercises will be conducted for exercises which do not satisfactorily test the emergency response plan as determined by FEMA and the NRC.

6.20 Emergency Plan and Procedures Administrative Controls

6.20.1 The Quality Assurance Organization is responsible for assuring that a review of the WCGS Emergency Planning and Preparedness Program will be performed, at least once every twelve months, in accordance with 10CFR 50.54(t).

1. Personnel performing this review will have no direct responsibility for implementation of the Emergency Planning and Preparedness Program.

2. The review shall evaluate interfaces with state and local governments, licensee drills, exercises, capabilities, procedures and emergency facilities.

3. The results of the review are reported to owner representatives and WCGS Senior Management and shall be retained for at least five years.

4. Correction of review findings are evaluated and implemented using normal WCGS procedures.

5. The applicable portions of the review shall be made available to the State and local governments.

6.20.2 The Manager Emergency Planning ensures the coordination and documentation of RERP reviews and revisions and the RERP distribution. The RERP is revised annually to incorporate changes identified during drills, exercises and the 10CFR 50.54(t) review.

1. The RERP and approved changes are distributed to all organizations and individuals with responsibility for implementation of the RERP.

6.20.3 The Manager Emergency Planning ensures emergency planning personnel are properly trained.

6.20.4 Action items required to be performed in a time period are allowed a 1.25 times frequency grace period to complete the item.

6.21 Recovery Plan

6.21.1 The Recovery Plan is activated in a progressive manner when the Site, if EOF not activated, or Off-Site Emergency Manager determines stabilized plant conditions warrant the transition of the emergency response efforts to the recovery phase.

6.21.2 **IF** a General Emergency has been reached, **THEN** NRC and KDEM concurrence shall be obtained prior to downgrading.

6.21.3 The EPPs provide the general plans for reentry and recovery and describe the means by which decisions to relax protective measures are reached.

1. Evaluation of the status of the three fission product barriers is used for de-escalation. As the situation improves and barriers are restored, the next lower level of event may be declared.

2. De-escalation may also occur if conditions have stabilized such that the potential for re-escalation to a higher level has been removed and a controlled situation exists. A declaration of de-escalation is provided by the Emergency Manager based on known information and recommendations of the ERO.

3. Guidelines are provided for Reentry Team(s) to perform surveys and monitoring activities to be employed for initial reentry.

6.21.4 During the recovery process the normal procedures employed for configuration control, reporting, interfaces with regulatory agencies and support groups, exposure control, environmental monitoring, and procurement of supplies and services shall be utilized.

6.21.5 The Recovery Plan utilizes the necessary technical, administrative, managerial and support personnel that may be required for the recovery phase of emergency response, as determined by Site or Off-site Emergency Managers. The responsibilities and functions of the Emergency Managers and staff are detailed in the EPPs.

7.0 RECORDS

7.1 None

8.0 FORMS

8.1 APF 06-002-02, EMERGENCY ACTION LEVELS TECHNICAL BASES [3.2.1]

8.2 APF 06-002-03, EAL CLASSIFICATION MATRIX [3.2.1]

ATTACHMENT A
(Page 1 of 1)

EFFECTIVE 10-MILE EPZ POPULATION

Significant Population Centers	Approximate Population	Subzone	Distance (miles) And Direction From The Site To Population Center
Burlington, KS	2,674	SW-1	3.5 Southwest
New Strawn, KS	394	W-1	3.4 West-Northwest
Waverly, KS	592	NE-2	11.5 North-Northeast
LeRoy, KS	561	SE-3	11.1 South-Southeast
Aliceville, KS	40	SE-2	9.3 Southeast
Ottumwa, KS	20	NW-1	6.8 West-Northwest
Sharpe, KS	10	N-1	2.4 North
Jacob's Creek	70	W-2	10.0 West

The city population numbers were taken from the **2010** census.

-END-

ATTACHMENT B
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SUBZONE EVACUATION TIMES

B.1 Table B.1 lists each subzone and the population in that subzone.

TABLE B.1
POPULATION BY SUBZONE

Evacuation Subzone	Evacuation Zone	Population
Center (CTR)	0 - 2	132
North-1 (N-1)	2 - 5	27
Northeast-1 (NE-1)	2 - 5	48
East-1 (E-1)	2 - 5	62
Southeast-1 (SE-1)	2 - 5	57
South-1 (S-1)	2 - 5	45
Southwest-1 (SW-1)	2 - 5	2,854
West-1 (W-1)	2 - 5	480
Northwest-1 (NW-1)	2 - 5	112
North-2 (N-2)	5 - 10	163
Northeast-2 (NE-2)	5 - 10	682
Northeast-3 (NE-3)	5 - 10	115
East-2 (E-2)	5 - 10	54
Southeast-2 (SE-2)	5 - 10	124
Southeast-3 (SE-3)	5 - 10	662
Southeast-4 (SE-4)	5 - 10	45
South-2 (S-2)	5 - 10	81
Southwest-2 (SW-2)	5 - 10	137
West-2 (W-2)	5 - 10	167
Northwest-2 (NW-2)	5 - 10	149

B.2 Total Coffey County population equals 8,601 persons (2010 census). Effective 10-Mile Emergency Planning Zone Subtotals are as follows:

- Effective 0 - 2-mile zone = 8 persons
- Effective 2 - 5-mile zone = 3,345 persons
- Effective 5 - 10-mile zone = 2,843 persons
- Effective 0 - 10-mile zone = 6,196 persons

B.3 Table B.2 lists evacuation confirmation time parameters.

TABLE B.2
EVACUATION CONFIRMATION TIME PARAMETERS

EPZ Location	Miles Traveled	Number of Houses	Speed Between Houses	Effort in Vehicle	Vehicles Assumed Available	Confirmation Time
Burlington	36	1,183	5 mph	105 Hrs	11	9.5 Hrs
New Strawn	3	229	5 mph	20 Hrs	3	6.6 Hrs
LeRoy	9	289	5 mph	43 Hrs	5	8.6 Hrs
Waverly	7	280	5 mph	33 Hrs	4	8.3 Hrs
Remaining EPZ*	289	649	30 mph	80.5 Hrs	8	10.3 Hrs

* Includes the evacuation confirmation of the U.S. Army Corps of Engineers areas at John Redmond Reservoir, Coffey County Lake, and the U.S. Fish and Wildlife Service area north of the Neosho River.

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SUBZONE EVACUATION TIMES

B.4 Coffey County has Letters of Agreement or Mutual Aid Agreements with surrounding medical transport groups and the Coffey County Public Transportation to assist with transportation for non-ambulatory persons. For all transportation-dependent people, including the non-ambulatory occupants of the Burlington Life Care Center, Sunset Manor Nursing Home, and the Coffey County Hospital, an evacuation time of 2.5 hours is estimated using area resources.

B.5 Tables B.3 and B.4 list the 10-mile evacuation times for average and adverse weather conditions.

TABLE B.3 10-MILE EVACUATION TIMES FOR **AVERAGE** WEATHER CONDITIONS (HOURS)		**TABLE B.4** 10-MILE EVACUATION TIMES FOR **ADVERSE** WEATHER CONDITIONS (HOURS)	
Subzone	Effective 10-mile	Subzone	Effective 10-mile
CTR	1:20	CTR	2:00
CCL	1:20	CCL	2:00
JRR	1:20	JRR	2:00
N-1	1:30	N-1	2:15
NE-1	1:20	NE-1	2:00
E-1	1:25	E-1	2:00
SE-1	1:25	SE-1	2:00
S-1	1:30	S-1	2:15
SW-1	1:45	SW-1	2:25
W-1	1:45	W-1	2:25
NW-1	1:45	NW-1	2:25
N-2	1:45	N-2	2:20
NE-2	1:40	NE-2	2:20
NE-3	1:30	NE-3	2:05
E-2	1:35	E-2	2:10
SE-2	1:35	SE-2	2:10
SE-3	1:45	SE-3	2:25
SE-4	1:40	SE-4	2:20
S-2	1:45	S-2	2:25
SW-2	1:50	SW-2	2:30
W-2	1:50	W-2	2:25
NW-2	1:40	NW-2	2:25

-END-

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
A. - ASSIGNMENT OF RESPONSIBILITY (Organization Control)			
1.a	6.5, 6.6, 6.8, 6.9	WCGS on-site and off-site organizations	EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS EPP 06-004, PUBLIC INFORMATION ORGANIZATION
1.a	6.10, 6.11, 6.12, 6.13	Outside organizations	
1.b	6.5 - 6.13		
1.c	FIGURE 6		
1.d	6.5, 6.6, 6.8, 6.9		EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
1.e	6.5.2	Notifications are made from the control room, at the direction of the Site Emergency Manager.	
2.a & 2.b	N/A		
3.	ATTACH. G		
4.	6.8.2	Off-site Emergency Manager	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
	6.6.11, 6.8.8	Administrative Coordinators	EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
B. - ON-SITE EMERGENCY ORGANIZATION			
1.	6.5, Figure 2		EPP 06-001, CONTROL ROOM OPERATIONS
2.	6.5.2	Site Emergency Manager	EPP 06-001, CONTROL ROOM OPERATIONS
3.	5.1.1, 5.2.1, 5.8.1, 6.5.2, 6.6.5, 6.6.5.1, 6.8.2	Transfer of control from the Shift Manager to the Site Emergency Manager.	EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
B. - ON-SITE EMERGENCY ORGANIZATION			
4.	6.5.2, 6.6.5, 6.8.2	Responsibilities of the Shift Manager, Site Emergency Manager, Off-site Emergency Manager	EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
5	6.5, 6.6, 6.7, 6.8, 6.9	Major ERO positions and their functions	EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
6.	6.5, 6.6, 6.7, 6.8, 6.9, Fig. 5 & 6	Interfaces between WCGS and outside organizations	
7a.	6.8.8	Administrative Coordinator	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
7b.	6.21	Recovery Plan	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
7c.	6.8.2	Duty Emergency Manager	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
7.d	6.9	Off-site Public Information Coordinator & Wolf Creek Public Information Officer	EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS EPP 06-004, PUBLIC INFORMATION ORGANIZATION
8.	6.13	Specify contractors / organizations available on request	
9.	6.10	Identify local support agencies	
C. - EMERGENCY RESPONSE SUPPORT AND RESOURCES			
1.a	6.8.2	Persons authorized to request assistance	
1.b	6.12	Expected Federal resources	
1.c	6.4.1, 6.4.2, 6.4.4, 6.12.5	Space is provided for NRC personnel in the Control Room, TSC, and EOF. The EOF also has limited space for state and local personnel.	
2a.	N/A		
2.b	6.8.10		

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
C. - EMERGENCY RESPONSE SUPPORT AND RESOURCES			
3.	6.14.7	Identify radiological laboratories	
4.	6.13 and ATTACH G	Identify other facilities and organizations which could assist	
D. - EMERGENCY CLASSIFICATION SYSTEM			
1.	6.2	Emergency Classifications	EPP 06-005, EMERGENCY CLASSIFICATION
2.	6.2	Initiating conditions	EPP 06-005, EMERGENCY CLASSIFICATION
3. & 4.	N/A		
E. - NOTIFICATION METHODS AND PROCEDURES			
1.	6.3.3, 6.5.2, 6.6.5, 6.8.2	Notifications	EPP 06-007, EMERGENCY NOTIFICATIONS
2.	6.16.1, 6.5.3	Notification of responding personnel	EPP 06-015, EMERGENCY RESPONSE ORGANIZATION CALLOUT
3.	6.3.3, 6.5.2, 6.6.5, 6.8.2	Initial notifications	EPP 06-007, EMERGENCY NOTIFICATIONS
4.a thru 4.n	6.5.2, 6.6.5, 6.8.2	Follow-up Notifications	EPP 06-007, EMERGENCY NOTIFICATIONS
5.	N/A		
6.	6.10.3, 6.3.4.3, Attach B	Evacuation times	
7.	6.16.2.4		
F. - EMERGENCY COMMUNICATIONS			
1.a	6.5		
1.b	6.5.2		
1.c	6.5.2, 6.5.3, 6.6.5, 6.6.9, 6.8.2		
1.d	6.4.4, 6.16		
1.e	6.5.3, 6.16.1	ERO Callout	EPP 06-015, EMERGENCY RESPONSE ORGANIZATION CALLOUT

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
F. - EMERGENCY COMMUNICATIONS			
1.f	6.4.4, 6.5.2, 6.5.3, 6.6.9, 6.16.1		EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
2.	6.10.6		
3.	6.15, 6.18.1, 6.18.6		EPP 06-018, MAINTENANCE OF EMERGENCY FACILITIES AND EQUIPMENT/COMMUNICATION CHECKS
G. - PUBLIC EDUCATION AND INFORMATION			
1.	6.16.2		
2.	6.17.5, 6.17.6		
3.a	6.4.5, 6.16.2		EPP 06-004, PUBLIC INFORMATION ORGANIZATION
3.b	6.4.5		
4.a	6.9.2		EPP 06-004, PUBLIC INFORMATION ORGANIZATION
4.b	6.9.2, 6.9.9		EPP 06-004, PUBLIC INFORMATION ORGANIZATION
4.c	6.4.5, 6.9.8		EPP 06-004, PUBLIC INFORMATION ORGANIZATION
.	6.16.2		
H. - EMERGENCY FACILITIES AND EQUIPMENT			
1.	6.4.2, 6.4.3, 6.6, 6.7		EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS
2.	6.4.4, 6.8		EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
3.	6.8	Establish EOF.	
4.	6.6.1, 6.8.1, Fig.2,3,4 ATTACH. D		
5.a	6.14.3, 6.14.4, 6.14.5		
5.b	6.4.1, 6.4.2, 6.14.2		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
5.c	6.2.2, 6.14.2		
5.d	6.14.6		
6.a	6.14.1		

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
H. - EMERGENCY FACILITIES AND EQUIPMENT			
6.b	6.14.1, Figure 8 & Figure 9		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
6.c	6.14.7		
7.	6.15		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
8.	6.14.3		
9.	6.4.3		EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS
10.	6.15		EPP 06-018, MAINTENANCE OF EMERGENCY FACILITIES AND EQUIPMENT/COMMUNICATION CHECKS
11.	6.15		
12.	6.14.7		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
I. - ACCIDENT ASSESSMENT			
1.	6.2		APF 06-002-02, EMERGENCY ACTION LEVELS BASES APF 06-002-03, EAL CLASSIFICATION MATRIX
2.	6.3.8, 6.14.2		EPP 06-017, CORE DAMAGE ASSESSMENT METHODOLOGY
3.a	6.3.7		EPP 06-012, DOSE ASSESSMENT
3.b	6.3.7		EPP 06-012, DOSE ASSESSMENT
4.	6.3.7		EPP 06-012, DOSE ASSESSMENT
5.	6.14.3		
6.	6.3.7		EPP 06-012, DOSE ASSESSMENT
7.	6.3.8, 6.8.4		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
8.	6.3.7, 6.5.2, 6.6.5, 6.8.2		
9.	6.4.2, 6.4.4	Lower bound for iodine measurement capability is 1.0E-7uCi/cc.	
10.	6.3.7		EPP 06-012, DOSE ASSESSMENT
11.	6.3.8		EPP 06-011, EMERGENCY TEAM FORMATION AND CONTROL
J. - PROTECTIVE RESPONSE			
1.a thru 1.d	6.3.10, 6.3.11, 6.6.5		EPP 06-010, PERSONNEL ACCOUNTABILITY AND EVACUATION

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
J. - PROTECTIVE RESPONSE			
2.	6.3.10, 6.3.11, Figure 1		
3.	6.3.9, 6.3.12, 6.4.8,		
4.	6.3.9, 6.3.12		
5.	6.3.10, 6.3.11, 6.6.5		EPP 06-010, PERSONNEL ACCOUNTABILITY AND EVACUATION
6.a thru 6.c	6.3.13, 6.3.14		EPP 06-013, EXPOSURE CONTROL AND PERSONNEL PROTECTION EPP 06-011, EMERENCY TEAM FORMATION AND CONTROL
7.	6.3.3		EPP 06-006, PROTECTIVE ACTION RECOMMENDATION
8.	Attach. B		
9.	N/A		
10.a & 10.b	Fig. 1		
10.c	6.10.2, 6.16.2		
10.d & 10.1	N/A		
10.m	6.3.4.2		EPP 06-006, PROTECTIVE ACTION RECOMMENDATION
11. & 12.	N/A		
K. - RADIOLOGICAL EXPOSURE CONTROL			
1.a thru 1.g	6.3, 6.4.6, 6.10.5, 6.10.6		
2.	6.3.15, 6.3.16, 6.5.2, 6.6.5, 6.8.2		EPP 06-001, CONTROL ROOM OPERATIONS EPP 06-002, TECHNICAL SUPPORT CENTER OPERATIONS EPP 06-003, EMERGENCY OPERATION FACILITY OPERATIONS
3.a & 3.b	6.3.16, 6.3.17, 6.3.18, 6.4.2, 6.15.1		
4.	N/A		

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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

0654 Section	RERP Section	Comments	Procedure
5.a & 5.b	6.3.20, 6.3.21		
6.a thru 6.c	6.3.21, 6.3.22, ATTACH. E		
7.	6.3.13, 6.4.6		
L. - MEDICAL AND PUBLIC HEALTH SUPPORT			
1.	6.10.5		
2.	6.4.6		
3.	N/A		
4.	6.10.6		
M. - RECOVERY AND REENTRY PLANNING AND POST-ACCIDENT OPERATIONS			
1.0	6.21		EPP 06-008, RE-ENTRY, RECOVERY, AND TERMINATION OPERATIONS
2.	6.21		
3.	6.21		
4.	6.3.7	This is not specifically identified as a post-accident function	
N. - EXERCISES AND DRILLS			
1.a & 1.b	4.17, 6.19		EPP 06-009, DRILL AND EXERCISE REQUIREMENTS
2.a	6.18.1		
2.b	6.18.2		
2.c	6.18.3		
2.d	6.18.4		
2.e(1)	6.18.5		
2.e(2)	6.18.5		
3.a thru 3.f	6.19.7		
4.	6.19.6		
5.	6.19.6		
O. - RADIOLOGICAL EMERGENCY RESPONSE TRAINING			
1.a	6.17		EPP 06-021, TRAINING PROGRAMS
1.b	N/A		
2.	6.17.2, 6.17.5		
3.	6.4.6		
4.	6.17.4		
5.	6.17		

ATTACHMENT C
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CROSS REFERENCE BETWEEN NUREG 0654, RERP, & WCGS PROCEDURES

P. - RESPONSIBILITY FOR THE PLANNING EFFORT: DEVELOPMENT, PERIODIC REVIEW AND DISTRIBUTION OF EMERGENCY PLANS			
1.	6.17		
2.	5.3, 6.17.2		
3.	6.20.2		
4.	6.20.2		
5.	6.20.2		
6.	6.10, 6.11		
7.	ATTACH. C		
8.	Table of Contents and ATTACH. C		
9.	6.20.1		
10.	6.20.2		

-END-

ATTACHMENT D
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WCGS MINIMUM STAFFING FOR EMERGENCIES

(Reference Step 3.1.10/Step 3.1.11)

FUNCTIONAL AREA(1)	MAJOR TASKS	POSITION TITLE OR EXPERTISE	ON SHIFT	Capability For Additions: **	
				60 mins	90 mins
Plant Operations & Assessment of Operational Aspects		Shift Manager (SRO) Control Room Supervisor (CRS) Reactor Operator (RO) Nuclear Station Operator	1 1 2 6***	- - - -	- - - -
Emergency Direction and Control		Shift Manager Site Emergency Manager	1* -	- 1	- -
Notification/ Communication	Notify licensee, State, local and Federal personnel & maintain communication	Emergency Communicator	1	3	-
Radiological Accident Assessment & Support of Operational Accident Assessment	Emergency Operations Facility (EOF Director)	Off-Site Emergency Manager	-	-	1
	Off-site dose assessment	Sr. Radiation Protection Expertise	1*	1	1
	Off-site surveys	RP Personnel	-	3	-
	On-site (out-of-plant)	RP Personnel	-	2	-
	In-Plant surveys	RP Personnel	2	1	-
	Chemistry/ radiochemistry	Chemistry Personnel	1	1	-
Plant System Engineering, Repair & Mitigative Actions	Technical Support	Senior Reactor Operator (SRO) Core/Thermal Hydraulics Eng. Electrical Eng. Mechanical Eng.	1* - - -	- 1 1 1	- - - -
	Repair and Mitigative Actions	Radwaste Operator Mechanical Maint. Electrical Maint. I&C Technician	1* - 1* -	- 1 1 1	- - - -
Protective Actions (In-Plant)	Radiation Protection: Access Control Coverage for repair, mitigative actions, search & rescue, first-aid & firefighting	RP Personnel	1*	2	-
Firefighting = Fire Brigade(FB)		--	FB per TRM (TR5.2.1.b)	Local Support	Local Support
Rescue Operations and First Aid		--	2*	Local Support	Local Support

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WCGS MINIMUM STAFFING FOR EMERGENCIES

FUNCTIONAL AREA[1]	MAJOR TASKS	POSITION TITLE OR EXPERTISE	ON SHIFT	Capability For Additions: **	
				60 mins	90 mins
Site Access Control and Account-ability	Security, firefighting communications, personnel accountability	Security Personnel	All per Security Plan		
		TOTAL	14	20	2

* May be provided by shift personnel assigned to other functions.

** It is a goal to add, in accordance with this table, to the on-shift capabilities when determined necessary after a declared Emergency.

*** May be provided by a Reactor Operator (RO).

[1] Discipline-specific skills training for personnel in the above table are contained in discipline-specific training documents such as AP 30D-006, CHEMISTRY TRAINING PROGRAM and AP 30D-100, RADIATION PROTECTION TRAINING PROGRAMS. **[Commitment Step 3.2.3]**

-END-

ATTACHMENT E
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EPA/KANSAS PROTECTIVE ACTION GUIDES

E.1 Population Protective Action Guides (PAG) For Exposure To A Plume - Early Phase

Protective Action	PAG (Projected Dose)	Comments
Evacuation	1-5 rem (Note 1)	Evacuation (or sheltering should normally be initiated at 1 rem.
Administration of stable iodine (Note 2)	5 rem (Note 3)	Special Populations

(1) Dose is TEDE, which includes effective dose equivalent from external and internal sources and committed effective dose equivalent from inhalation. Committed dose equivalents to the thyroid and to the skin may be 5 and 50 times larger, respectively

(2) Use of KI is not planned for general population in Kansas. The State considers prompt evacuation of the public to be a more effective protective measure than administration of KI.

(3) Committed dose equivalent to be thyroid from radioiodine.

E.2 Emergency Worker Dose Limits (for all types of radiological incidents)

E.2.1 Keep all doses ALARA and limit doses to the following TEDE levels:

Dose Limit (Rem)	Activity	Condition
5	All	
10	Protecting valuable property	Lower dose not practicable
25	Life saving or protection of large populations	Lower dose not practicable
>25	Life saving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved

E.3 Emergency Worker Iodine Dose Limits

E.3.1 Keep all doses ALARA and limit iodine doses to the following committed dose equivalent through use of KI and/or respiratory protection:

Dose Limit (Rem)	Activity
10	Any worker, any phase
No Limit - Life saving activities or protection of large populations	No specific upper limit is given for thyroid dose since in life saving activities; complete thyroid loss might be an acceptable sacrifice if a life can be saved. However, this should not be necessary if respirators and/or thyroid protections for rescue personnel are available as a result of adequate planning.

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EPA/KANSAS PROTECTIVE ACTION GUIDES

E.4 Protective Action Guides For Exposure To Deposited Radioactivity During the Intermediate Phase of a Nuclear Incident

Protective Action	**PAG (Projected Dose)(1)**	**Comments**
Relocate the general population (Note 2)	≥ 2 rem	Beta dose to skin may be up to 50 times higher. Doses in any single year after the first will not exceed 0.5 rem.
Apply simple dose reduction techniques (Note 3)	<2 rem	These protective actions should be taken to reduce doses to as low as practicable levels

(1) The projected sum of effective dose equivalent from external gamma radiation and committed effective dose equivalent from inhalation suspended materials, from exposure or intake during the first year. Projected dose refers to the dose that would be received in the absence of shielding from structures of the application or dose reduction techniques. These PAGs may not provide adequate protection for some long-live radionuclides.

(2) Persons previously evacuated from areas outside the relocation zone defined by this PAG may return to occupy their residences. Cases involving relocation of persons at high risk from such action (e.g. patients under intensive care) should be evaluated individually.

(3) Simple dose reduction techniques include scrubbing and/or flushing hard surfaces, soaking or plowing soil, minor removal of soil from spots where radioactive materials have concentrated, and spending more time than usual indoors or in other low exposure rate areas.

-END-

ATTACHMENT F
(Page 1 of 1)

USAR CHAPTER 15 POSTULATED EVENTS

USAR CHAPER 15 POSTULATED EVENTS
Feedwater system malfunctions that result in decrease of feedwater temperature
Feedwater system malfunctions that result in increase of feedwater system flow
Excessive increase in secondary steam flow
Inadvertent opening and failure to close of SG ARV or safety vlv
Steam system piping failure (inside containment)
Steam system piping failure (outside containment)
Loss of external load (Main Generator trip)
Turbine Trip
Inadvertent closure of MSIVs
Loss of condenser vacuum & other events resulting in turbine trip
Loss of non-emergency AC power to station auxiliaries
Loss of normal feedwater
Feedwater system pipe break
Partial loss of forced RCS flow
Complete loss of forced RCS flow
RCP shaft seizure (locked rotor)
RCP shaft break
Uncontrolled RCCA bank withdrawal from a subcritical of low-power startup condition
Uncontrolled RCCA withdrawal at power
RCCA misalignment
Startup of inactive RCP at an incorrect temperature
CVCS malfunction resulting in a decrease in the boron concentration in the RCS
Inadvertent loading and operation of a fuel assembly in improper position
RCCA ejection accidents
Inadvertent ECCS operation at power
CVCS malfunction that increases RCS inventory
Inadvertent opening, with failure to close, of pressurizer safety or relief valve
Break in instrument line or other lines from RCS pressure boundary that penetrate containment
SG tube rupture
LOCA spectrum
Radioactive waste gas decay tank failure
Postulated radioactive releases due to liquid tank failure
Fuel handling accident (inside containment)
Fuel handling accident (Fuel Building)
Spent fuel cask drop
Anticipated transients without scram

-END-

ATTACHMENT G
(Page 1 of 1)

LETTERS OF AGREEMENT

Party:

The Coffey County Sheriff's Office

Board of Trustees Fire District No. 1, Coffey County, KS

Newman Regional Health

Coffey County Hospital and EMS

Med-Trans Corporation (formerly Life Star)

LifeSave Transport (formerly Life Team)

Wolf Creek Nuclear Operating Corporation/Callaway Energy Center, Ameren Missouri d/b/a Union Electric Co. Emergency Mutual Assistance Agreement

INPO (Support During an Emergency)

Department of Energy**

Nuclear Regulatory Commission**

National Weather Service***

EPRI/INPO/NEI/Member Utilities Coordination Agreement on Emergency Information****

Westinghouse

Law Enforcement*****

* As of January 1, 1987, the Letters of Agreement in this Supplement are transferred from Kansas Gas and Electric Company to the Wolf Creek Nuclear Operating Corporation. These Letters of Agreement are maintained on file and may be reviewed upon request.

** These LOAs will not be updated. They have been superseded by the publication of the "Federal Radiological Emergency Response Plan" in the Federal Register on 11/8/85.

*** As of 8/25/93, the National Weather Service stated in writing that a Letter of Agreement with WCGS is unnecessary. Their "National Plan for Radiological Emergencies at Commercial Nuclear Power Plants," November 1982, remains in effect.

**** INPO 03-001, INPO Letter of Agreement, is maintained on the INPO web page.

***** Agreements with Law Enforcement are safeguards information and, therefore, are controlled by Security.

-END-

ATTACHMENT H
(Page 1 of 1)

REPORTING OF INCIDENTS PER 10 CFR 20

		.2202 Telephone & Telegraph						.2203 Written		
		Immediate Notification			24 Hour Notification			30 Day Notification		
RADIATION INCIDENTS	**VALUES**	**WCGS**	**NRC**	**KDEM**	**WCGS**	**NRC**	**KDEM**	**WCGS**	**NRC**	**KDEM**
TEDE	25 REM (.25 Sv)	X	X	X				X	X	X
	5 REM (.05 Sv)	X				X	X	X	X	X
	MPE .1201				X			X	X	X
Shallow dose to skin or extremities in excess of	250 Rad	X	X	X				X	X	X
	50 REM	X				X	X	X	X	X
	MPE .1201				X			X	X	X
Lens dose equivalent	75 REM (.75 Sv)	X	X							
	15 REM (.15 Sv)	X				X	X			
	MPE .1201				X			X	X	
The release of radioactive material inside or outside of a restricted area	5 ALI	X	X	X				X	X	X
	1 ALI	X				X	X	X	X	X
	MPE .1201				X			X	X	X

X = Indicates notification is required
MPE = Maximum Permissible Exposure
DAC = Derived Air Concentration
WCGS = Wolf Creek Generating Station
NRC = Nuclear Regulatory Commission
KDEM = Kansas Division of Emergency Management
ALI = Annual Limit on Intake

-END-

FIGURE 1

EFFECTIVE 10-MILE EPZ, SUBZONES AND EVACUATION ROUTES

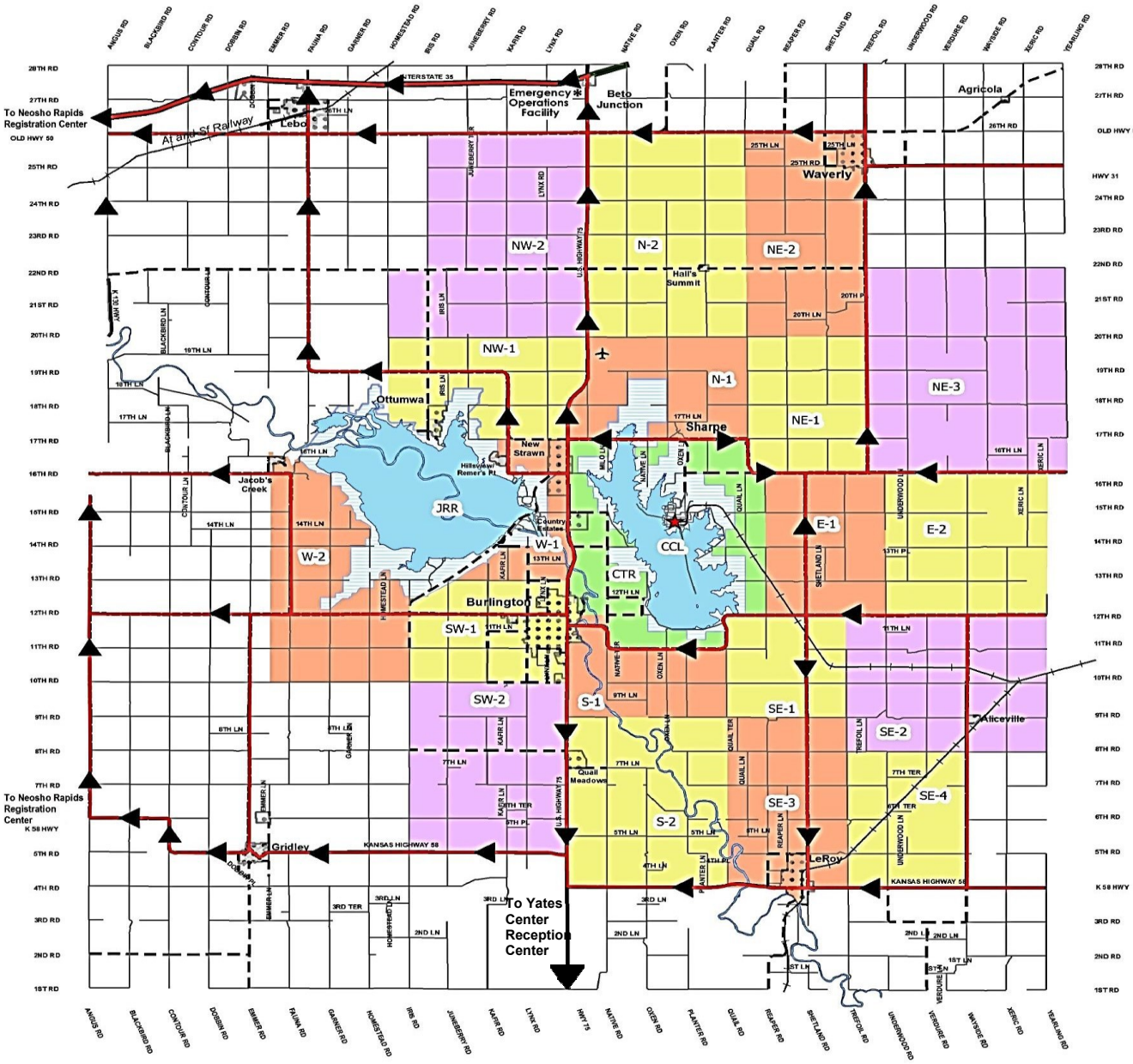
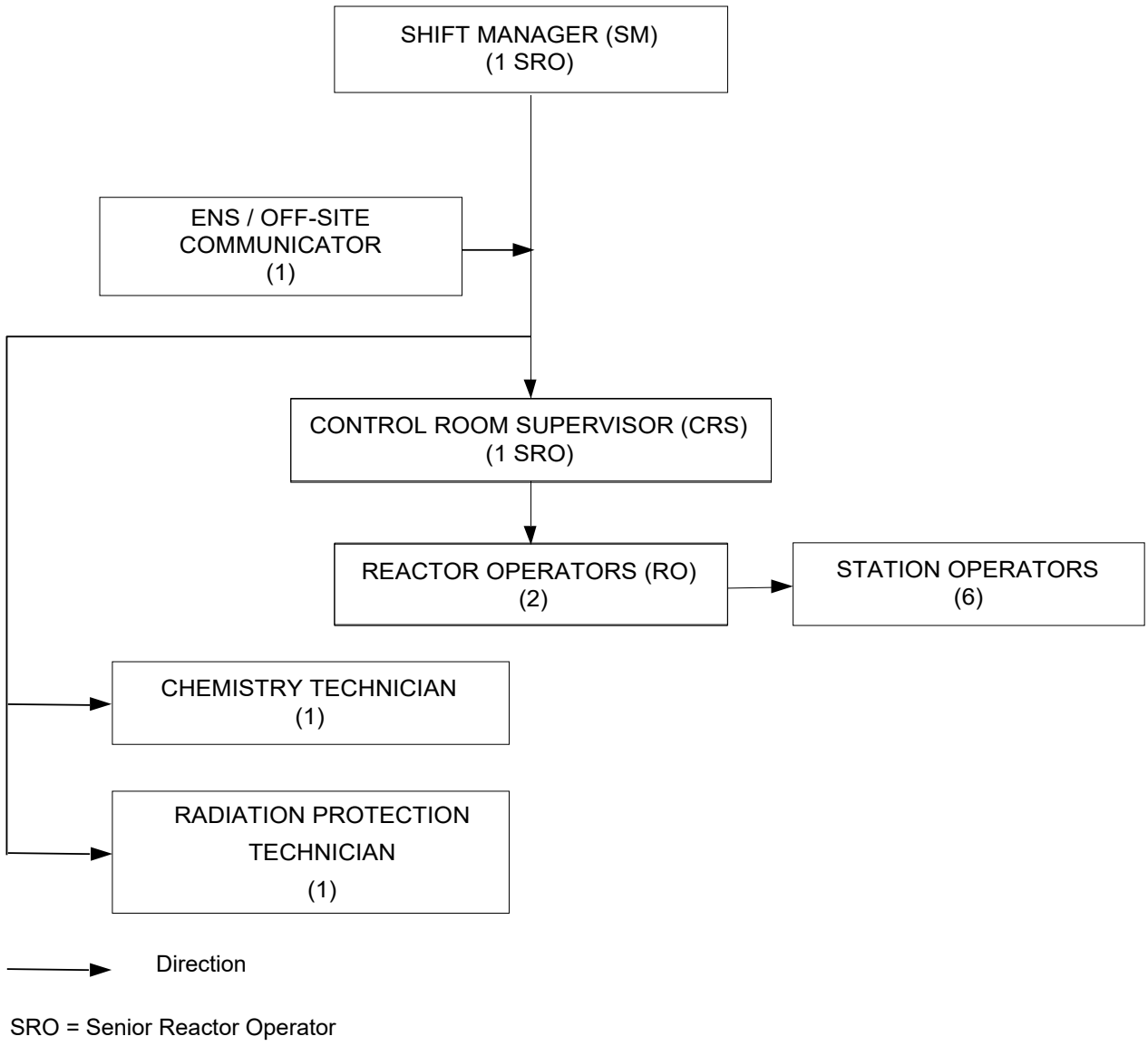


FIGURE 2

MINIMUM SHIFT STAFFING



SRO = Senior Reactor Operator

FIGURE 3

TSC/OSC ORGANIZATION

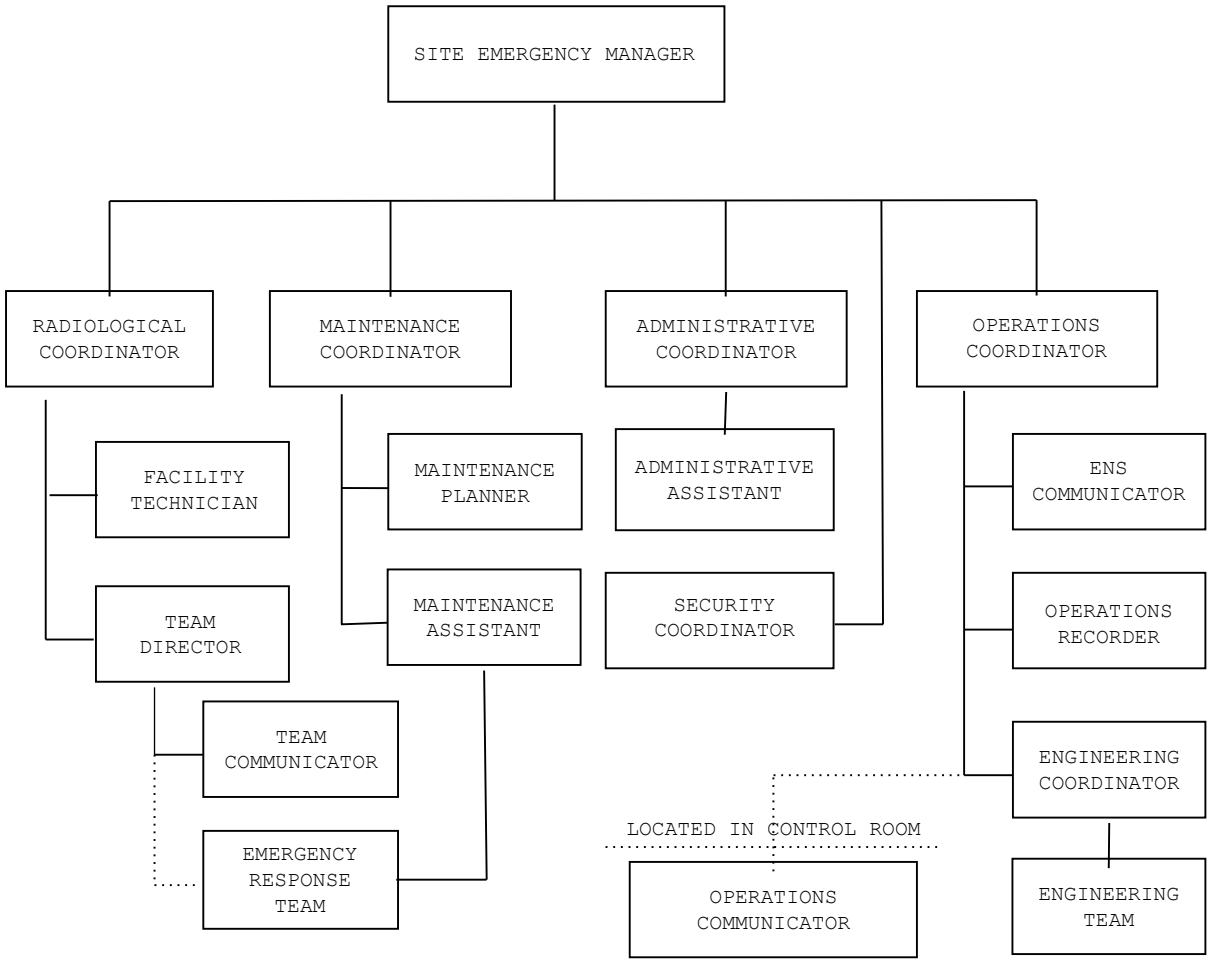


FIGURE 4

EOF ORGANIZATION

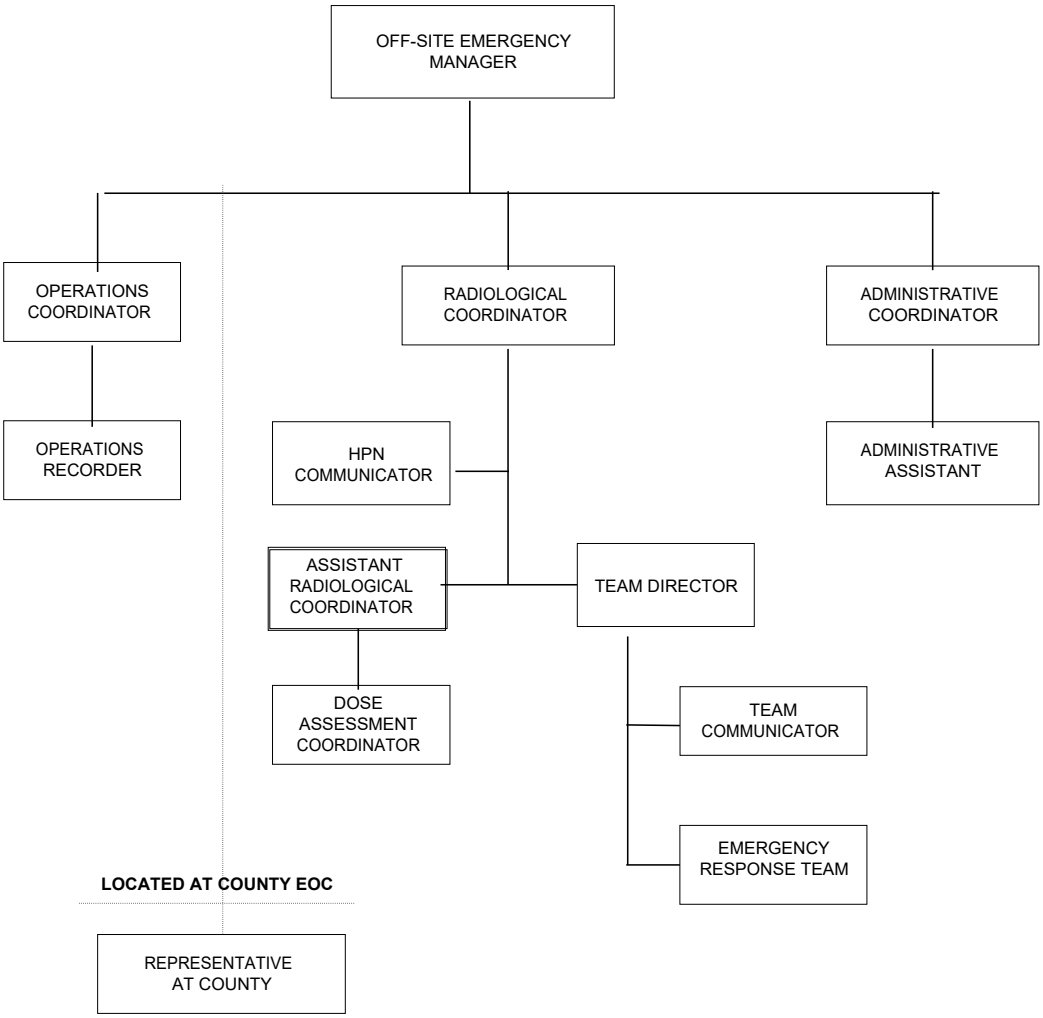
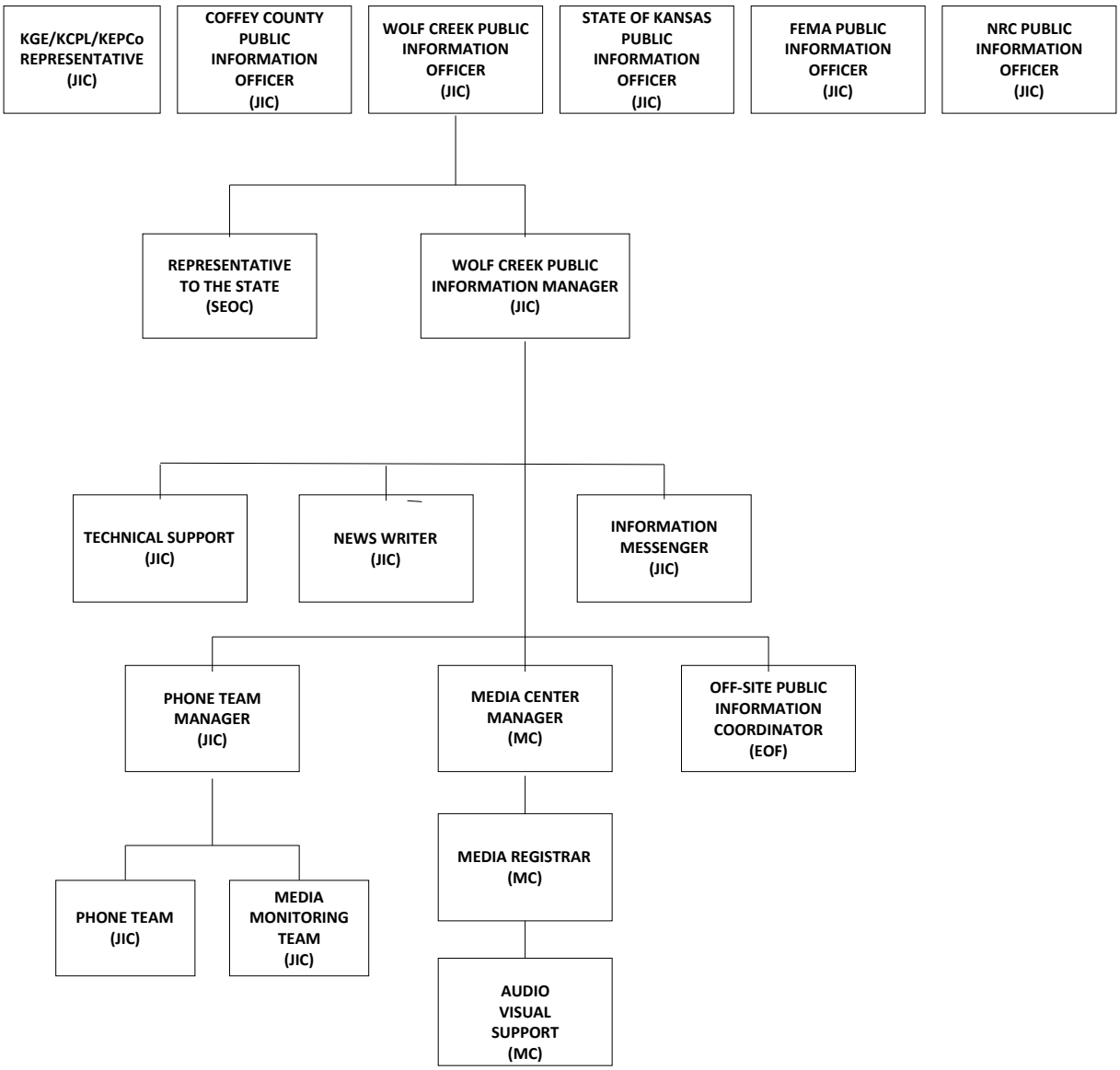
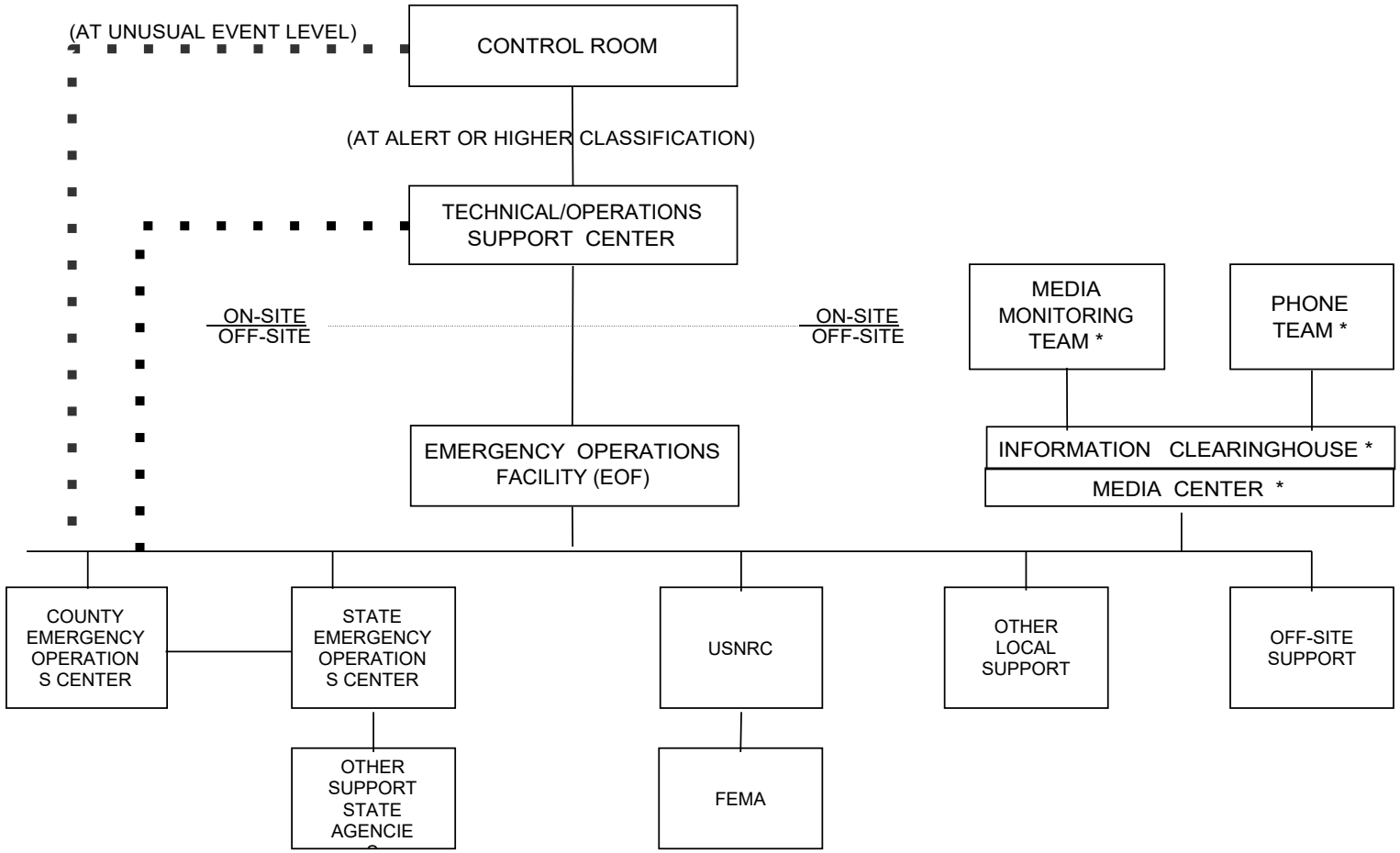


FIGURE 5

PUBLIC INFORMATION ORGANIZATION



EMERGENCY ORGANIZATION INTERFACES



NORMAL INTERFACE

TEMPORARY INTERFACE

* Any of these functions may be activated at any emergency classification level.

FIGURE 6

EMERGENCY ORGANIZATION INTERFACES

FIGURE 7

WCGS EMERGENCY RESPONSE FACILITIES

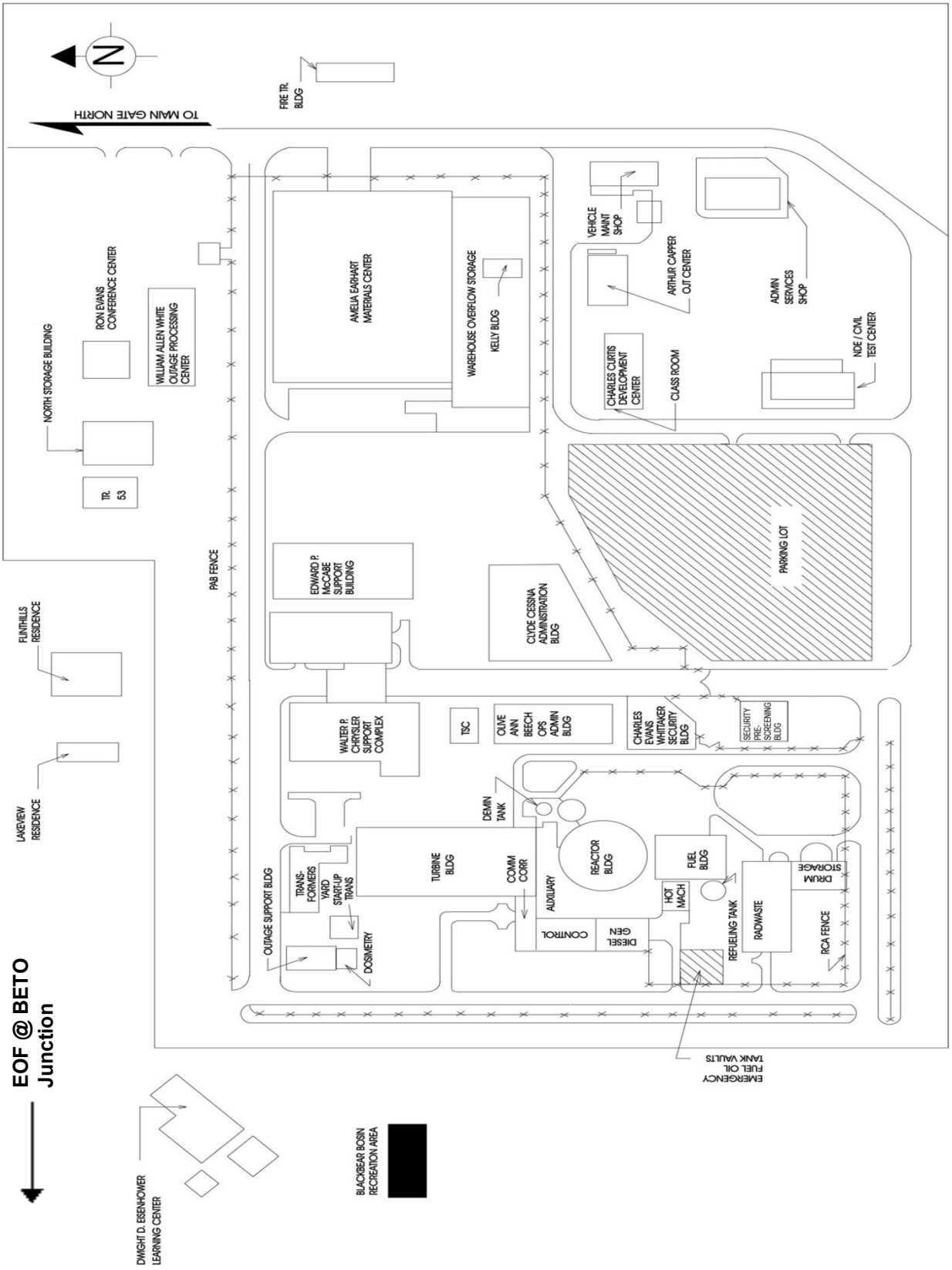
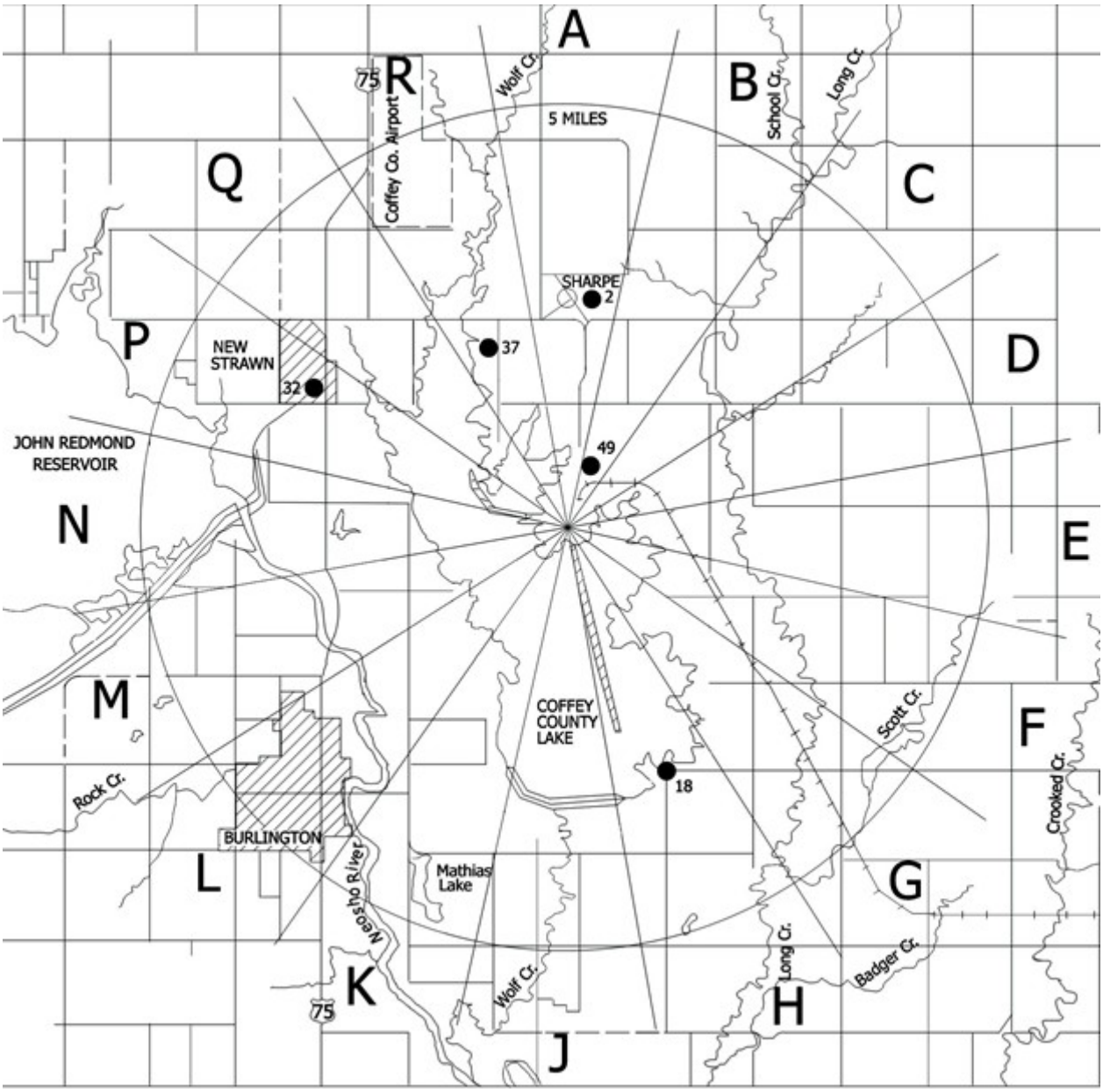


FIGURE 8

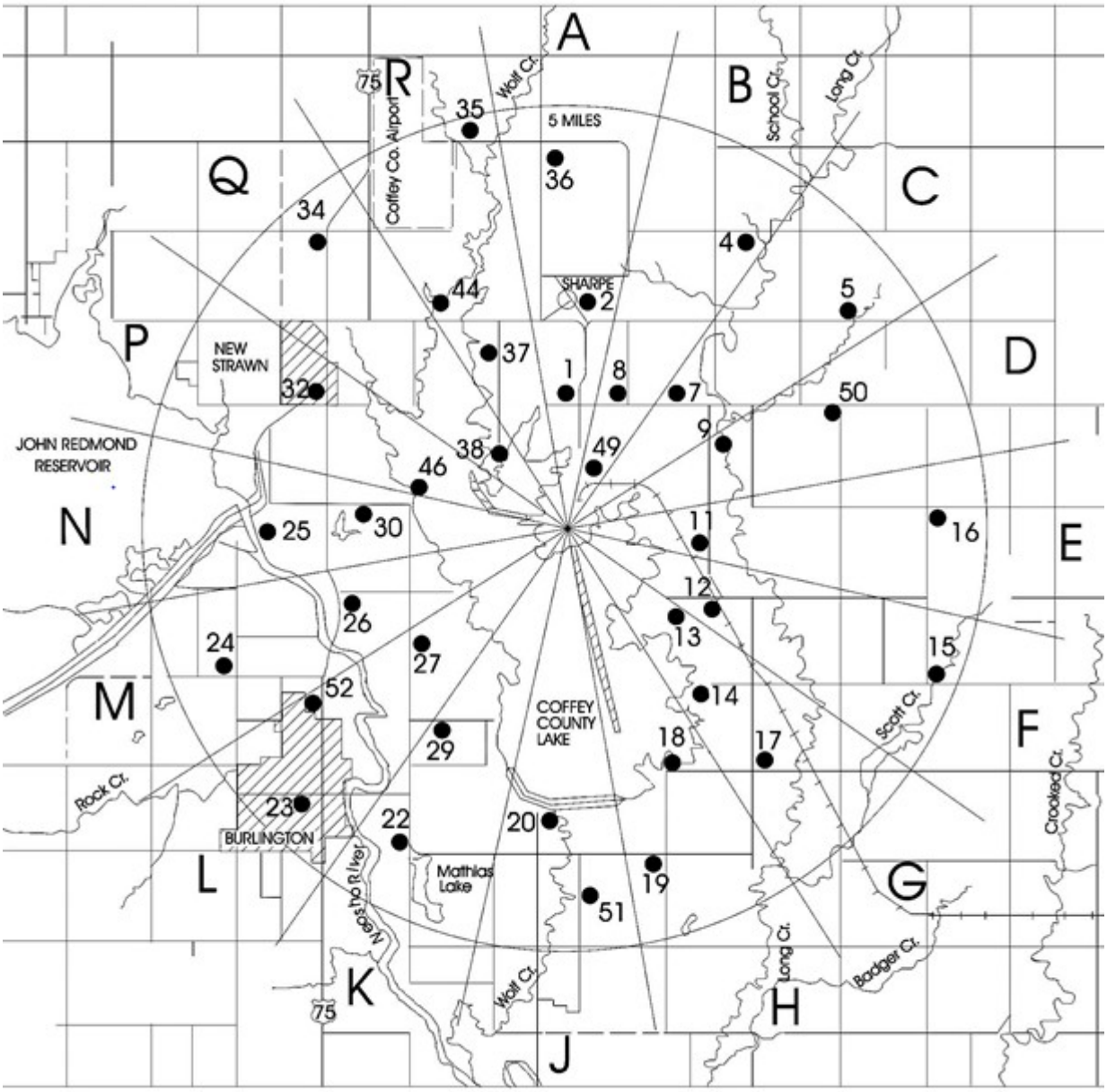
AIRBORNE PATHWAY SAMPLING LOCATIONS



- FIXED SAMPLING LOCATIONS

FIGURE 9

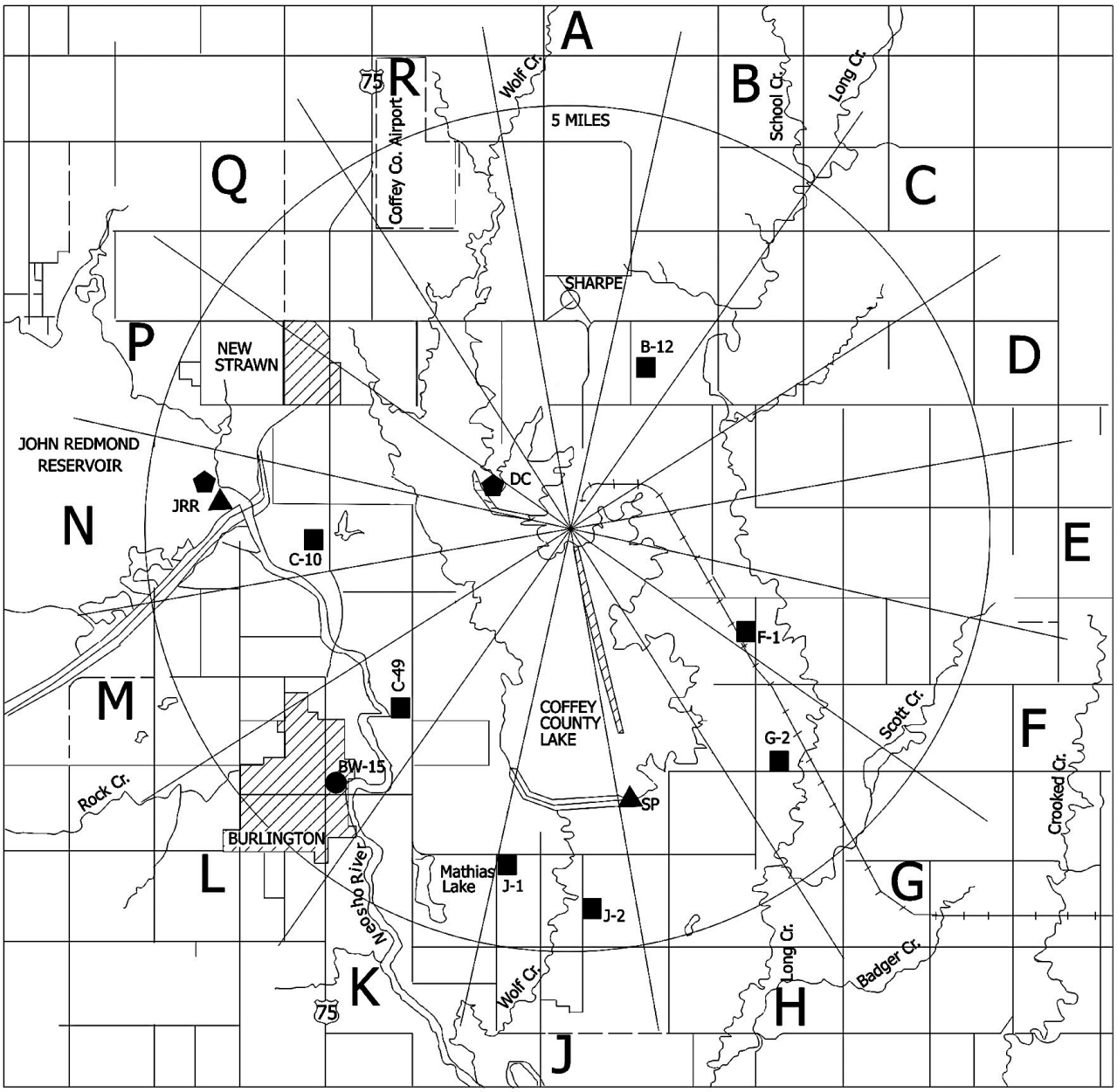
DIRECT RADIATION PATHWAY SAMPLING LOCATIONS



- DOSIMETER LOCATIONS

FIGURE 10

WATERBORNE PATHWAY SAMPLING LOCATIONS



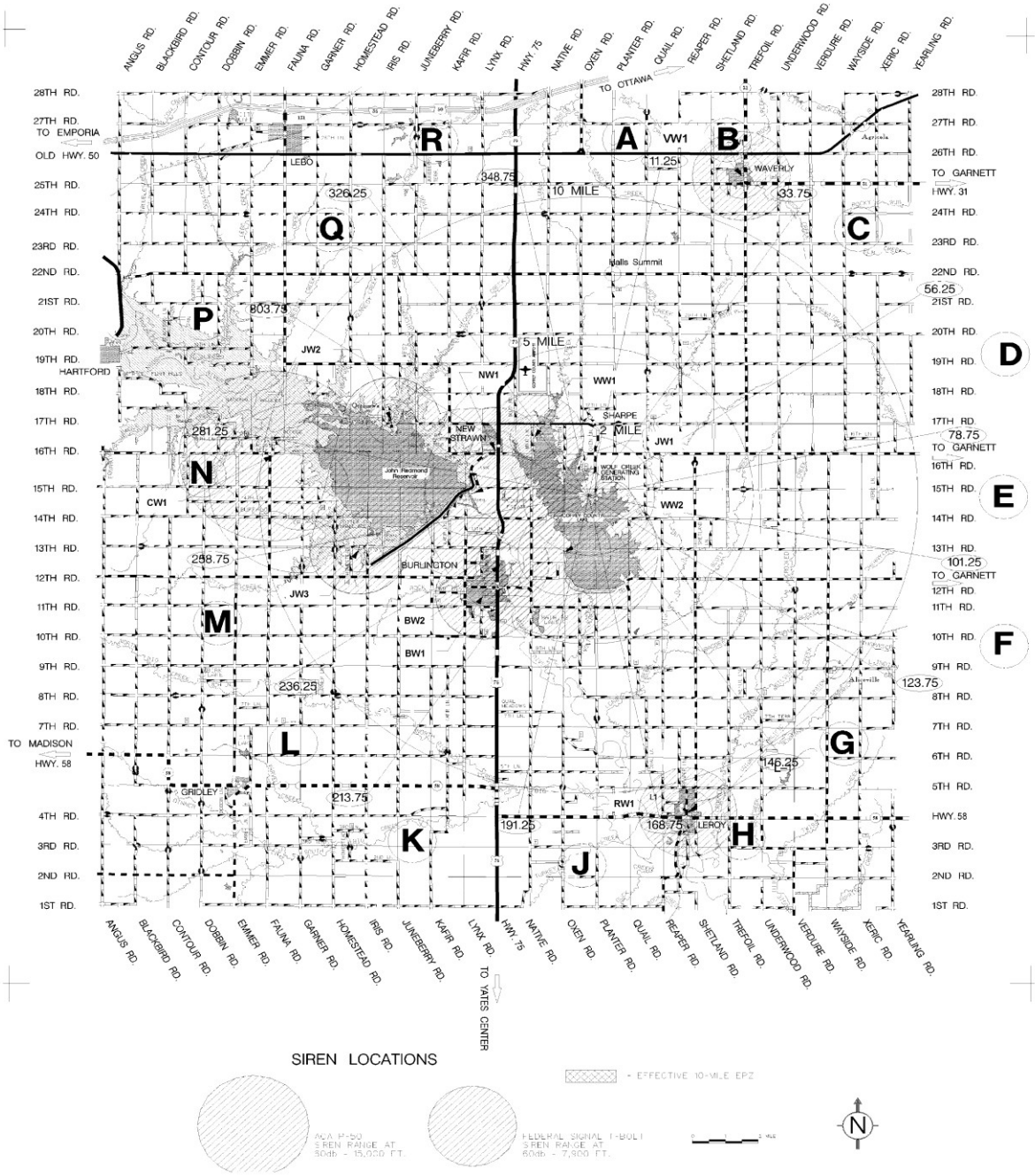
WATERBORNE PATHWAY SAMPLING LOCATIONS

● = DRINKING WATER ▲ = SURFACE WATER

■ = GROUND WATER ⬟ = SHORELINE SEDIMENT

FIGURE 11

FIXED SIREN SITING



Enclosure III

Wolf Creek Nuclear Operating Corporation
On-Shift Staffing Analysis Report

Prepared by:	Gregory J. Perry	03/24/2021 Date
Reviewed by:	Superintendent, Emergency Planning	05/05/2021 Date
Approved by:	Jaime H McCoy Site Vice President	05/14/2021 Date

Rev. 2

Table of Contents

1.0 Introduction

1.1 Background:

The 2011 amendments to **10 CFR 50 Appendix E** (Section IV.A.9). required nuclear power plant licensees to perform a detailed staffing analysis for specified scenarios to demonstrate that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of the assigned functions.

Subsequently, the NRC released "**NSIR/DPR-ISG-01**, Interim Staff Guidance - Emergency Planning for Nuclear Power Plants" to provide updated guidance information for addressing emergency planning (EP) requirements for nuclear power plants (NPPs). Section IV.C, On-Shift Staffing Analysis, of this guidance provides clarification on required content and identifies required analyzed events in the licensee's On-Shift Staffing Analysis to meet the amended portion of **10 CFR 50 Appendix E.**

The NEI On-shift ERO Staffing Task Force developed **NEI 10-05** "Assessment of On-Shift Emergency Response Organization Staffing" to establish a standard methodology for performing analyses of the ability of on-shift staff to perform all required functions and tasks. **NSIR/DPR ISG-01** supporting the Emergency Preparedness Rule endorsed the staffing analysis methodology provided in **NEI 10-05**, Revision 0 as an acceptable methodology for conducting the detailed staffing analysis.

Per **NEI 10-05:** "When completed, the staffing analyses performed in accordance with this document are to be incorporated into the site's emergency plan. Licensees will need to evaluate these emergency plan changes in accordance with 10 CFR 50.54(q) and follow the appropriate regulatory submittal requirements. In addition, the staffing analyses must be retained and available for subsequent regulatory inspection."

While the amendments to **10 CFR 50 Appendix E**, **NSIR/DPR-ISG-01,** and **NEI 10-05** provide additional regulatory requirements, clarification and the basis for creation of this document, the specific requirement for establishing a shift emergency organization to respond to emergency events appears in 10 CFR 50.47(b)(2). In November 1980, the NRC published Revision 1 of **NUREG-0654,** to provide specific evaluation criteria for determining compliance with the standards in **10 CFR 50.47(b)** and for the FEMA review of the adequacy of offsite emergency plans and preparedness. Revision 2 of RG 1.101, issued October 1981, endorses Revision 1 of NUREG-0654. The licensee's On-Shift Staffing Analysis and Radiological Emergency Response Plan must continue to comply with the requirements of **10 CFR 50.47(b)** and the regulatory guidance in Revision 1 of **NUREG-0654.**

1.2 Revision History

Revision 0 of the Wolf Creek On-Shift Staffing Analysis (OSA) Report was completed on December 12, 2012.

Revision 1 of the OSA Report was re-analyzed and determined that the number of Chemistry and HP *(Health Physics)* personnel required on shift could be reduced based on the recommendation from Quick Hit QH-2017-1438, "Assessment of Chemistry and Health Physics use within the On-Shift Staffing Analysis," initiated on February 27, 2017. Additionally, this reanalysis combined the Emergency Notification System Communicator (ENS) and the Off-Site Communicator (OSC) into one person performing both roles. Revision 1 of the Wolf Creek On-Shift Staffing Analysis (OSA) Report was approved on September 9, 2019 and incorporated with the approval of License Amendment No. 220 on April 1, 2019.

Revision 2 of the OSA report was re-analyzed based on a request from Condition Report 143612, initiated on 7/7/2020, to reduce/optimize on-shift required staffing by re-assigning emergency planning responsibilities to on-shift personnel with no emergency planning functions and by assigning multiple roles to on-shift individuals. Specifically, the OSA Draft Revision 2 achieves this (1) by assigning the dual-role of Off-Site Communicator (OSC) and Emergency Notification System Communicator (ENS) to the Work Control SRO (WCSRO), and (2) by reassignment of mitigation actions to allow removal of one Nuclear Station Operator (NSO). Revision 2 also incorporates into the WCGS Radiological Emergency Response Plan and WCGS Staffing Analysis the allowance by WCGS Technical Specifications, the WCGS Technical Requirements Manual, NRG Generic Letter 86-04, "Policy Statement on Engineering Expertise On-Shift", and NEI 10-05 "Assessment of On-Shift Emergency Response Organization Staffing", to utilize a Shift Manager or individual with a Senior Operator License as a dual-role individual to perform the Shift Technical Advisor (STA) function. The OSA has been re-analyzed with Draft Revision 2. The OSA Draft Revision 2 will be approved after the NRC approval of the License Amendment Request.

Since Revision 2 of the OSA supports reductions to staffing levels on shift that must be approved by the NRC prior to implementation in accordance with 50.54(q), a draft of this document and associated Corrective Action Program documents will be included in a License Amendment Request. Once the License Amendment Request is approved, the OSA and associated Corrective Action Program documents will be issued by the licensee.

2.0 Executive Summary

2.1 Methodology

Interim Staff Guidance (NSIR/DPR ISG-01) supporting the Emergency Preparedness Rule endorses the staffing analysis methodology provided in NEI 10-05, Revision 0, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," as an acceptable methodology for conducting the detailed staffing analysis. NEI 10-05 methodology was used for the analysis.

A multi-disciplinary team performed the analysis. The team included:

- Operations –Ed Winn
- Radiation Protection – Ryan Adams
- Chemistry – Neil Woydziak
- Licensing – Lucille Stone
- Emergency Planning – Gregory Perry

The NEI 10-05 methodology includes the following elements:

1. Identify and Analyze site-specific event scenarios meeting ISG requirements
   a. Identification of Site-Specific Events for use in Appendix A
   b. Appendix A, Analyzed Events and Accidents

2. Perform an OSA for each identified event.
   a. Identification of Minimum Staffing and Response Times for use in Appendix B
   b. Appendix B, Event Analysis

3. Perform a subsequent Time Motion Study (TMS) to analyze the results of the OSA if emergency response functions*:
   1. have not been previously analyzed by an existing JTA or performance-based assessment process

      OR

   2. overlap such that the integrated performance of the functions has not been previously analyzed by an existing JTA or performance-based assessment process (including combinations of functions).

*Reanalysis of the WCNOC OSA Report revealed that a Time Motion Study (TMS) was required for the Work Control SRO position.

Using the guidance in NEI 10-05, the multi-disciplinary team re-evaluated and updated Appendix A, Analyzed Events and Accidents with the latest revision of the USAR. The team re-performed a tabletop review of on-shift actions in response to those events identified in Appendix A. This review included the identification of needed resources and the time required to complete identified actions until augmentation of the on-shift ERO. Each event was analyzed separately and documented in the applicable Appendix B Event Analysis tables.

The reanalysis was conducted by first reviewing the event described in Appendix A. This review provided the team with a basic understanding of the event and resulting emergency classification.

The team reviewed emergency, off-normal and other operating procedure actions and identified the on-shift person responsible for performing each action. Specific resources needed to perform initial event response actions were identified from the procedures and documented as per the guidance in NEI 10-05.

The team determined when other on-shift resources would be required and identified the time required to perform expected emergency plan functions. Times were determined based on Time Critical Action/Time Sensitive Action documentation. This information was documented on the applicable tables identified in NEI 10-05.

The Emergency Plan functions for the event were reviewed and assigned to the on-shift resource responsible for performance of the identified function and documented as per NEI 10-05. Finally, the on-shift resources and their actions were summarized in a table (NEI 10-05 Table 1), with any conflicts requiring additional analysis identified as per NEI 10-05.

NEI-10-05 presents certain assumptions and limitations to be used during the analysis. The team used these assumptions and limitations in this re-analysis.

The result of the assessment is to be incorporated into the site Emergency Plan and is considered part of the licensing basis.

2.2 Assumptions and Referenced Procedures

2.2.1 (NEI 10-05) OSA Assumptions

1. Unless otherwise specified by initial conditions, it is assumed that the site is in Mode 1, Power Operations and operating at 100% power.

2. The event being analyzed occurs during off-normal work hours at a time when most ERO responders are not on site. Per AP 06-002, Radiological Emergency Response Plan, Attachment D, WCGS Minimum Staffing for Emergencies, augmentation for RP Technicians, Chemistry Technicians and Communicators is expected within 60 minutes. For the purposes of this analysis 90 minutes was used as the time period for the conduct of on-shift ERO response actions.

3. The on-shift complement is limited to the minimum required number and composition as described in the Emergency Plan

4. All on-shift positions are filled.

5. The DBT assumes a HOSTILE FORCE breached the Protected Area Fence but was neutralized with no adverse consequences to plant safety.

6. On-shift personnel can report to their assigned locations within time frames to allow for performance of assigned actions.

7. However, the DBT analysis must account for expected constraints on the movement of personnel.

8. The on-shift staff possesses the necessary Radiation Worker qualifications to obtain normal dosimetry and to enter Radiologically Controlled Areas (not high, locked high or very high radiation areas) without the aid of RP Technicians.

9. Operations personnel are qualified per regulation. Any “safety-related operator action” will be done by a member of the on-shift staff.

10. Fire Brigade actions will not be evaluated as part of this assessment UNLESS a role/function/task from another major response area is assigned as a collateral duty.

11. RP and Chemistry Technicians are qualified to perform the range of tasks expected by their position.

12. Security actions will not be evaluated UNLESS a role/function/task from another major response area is assigned as a collateral duty.

13. Simple and brief communications are acceptable collateral duties (i.e., plant page announcement/call for offsite assistance). This DOES NOT include initial notifications to Off-site Response Organization or NRC.

14. Performing a peer check is an acceptable collateral duty.

2.2.2 Site-Specific OSA Assumptions

1. HP technicians will be hereafter referred to as Radiation Protection (RP) technicians to align with station references to this work group, unless quoting a procedure step verbatim.

2. Scenarios #2 through #8 and #11 have concurrent loss of offsite power.

3. Loss of offsite power renders the normal control access point non-functional. However, fast access dosimetry is maintained available for emergency situations.

4. Fire Brigade is a collateral duty for 5 NSO's.

5. First Aid and Rescue is a collateral duty provided by Fire Brigade and Security.

6. Procedures require dose assessment and habitability for any classification of Alert or higher (EPP 06-001).

7. OFN KC-016 Operator required for Appendix R commitments (License Amendment #191 12/16/2012) and cannot be assigned other functions (TRM 5.2.1). The OFN KC Duty Person may be provided by a Reactor Operator (RO) or Nuclear Station Operator (NSO).

8. The STA function is performed by an individual with an SRO license as noted in the staffing table located in Section 2.3.2 of this report. This allowance is consistent with WCGS Tech. Spec. 5.2.2.e., Table TR 5.2.1-1 of the WCGS Technical Requirements Manual and NRG Generic Letter 86-04, "Policy Statement on Engineering Expertise On-Shift". NEI 10-05 states it is acceptable for the STA to be filled by an STA qualified individual already serving in another on-shift role (dual-role individual). Additionally, the ability of the on-shift staff to implement emergency response functions while serving in the dual-role capacity is periodically observed and evaluated during Operations Training. This analysis was conducted assuming the STA role was filled by the SM, but as noted above, the role may also be filled by the CRS or WCSRO. As stated in NEI 10-05, this is an acceptable collateral duty assignment that does not require a TMS.

9. The Shift Manager may make some site-specific event notifications such as to the Call Superintendent, Evergy, American Nuclear Insurers (ANI), Institute of Nuclear Power Operations, and the NRC Resident Inspector. These notifications by phone are considered communications that are approximately one minute in length and are acceptable tasks for the Shift Manager. No further analysis or TMS is required.

10. As a result of Revision 1 of the On-Shift Staffing Analysis, station procedures were revised to state that chemistry samples would not be collected following an emergency classification/declaration until the TSC is staffed (90 minutes). The request for a sample may be communicated to the augmenting chemistry technician upon their arrival at the technical support center. No further analysis or TMS is required.

11. Station staff are required to maintain continuous communications with the notification source during an aircraft threat in accordance with 10CFR50.54(hh) and Reg. Guide 1.214. There are no specific qualifications required to perform this task and the function is not required to be assigned in advance. The analysis of this event identified there are sufficient personnel on-shift to perform this task during the event. Specifically, a Nuclear Station Operator can be made available to fill this function. No further analysis or TMS is required.

2.2.3 Site-Specific Procedures used in OSA

In addition to site Emergency Planning procedures, the following procedures were used in the analysis. Any future changes to these documents will need to be evaluated for impact on the analysis. *(Revision dates effective as of 9/18/2020*)

Event Number	Procedure Title	Procedure Revision/Date	Basis Document Revision/Date
All	AI 21-016, Operator Time Critical Actions Validation	R/18, 1/15/2020	N/A
All	AP 21-001, Conduct of Operations	R/84, 3/24/2020	N/A
All	AP 21-004, Operator Response Time Program	R/4C, 09/11/2018	N/A
11	EMG C-0, Loss of All AC Power	R/44, 5/13/2020	R/27, 5/13/2020
7	EMG C-31, STGR with Loss of Reactor Coolant – Subcooled Recovery Desired	R/30, 05/13/2020	R/20, 05/13/2020
7	EMG C-32, SGTR with Loss of Reactor Coolant – Saturated Recovery Desired	R/27, 05/13/2020	R/15, 05/13/2020
1, 2, 3, 4, 5, 6, 7, 8, 11	EMG E-0, Reactor Trip or Safety Injection	R/42, 05/13/2020	R/29A, 10/30/2019
2, 3, 8	EMG E-1, Loss of Reactor or Secondary Coolant	R/31, 05/13/2020	R/20, 10/30/2019
2, 3, 7	EMG E-2, Faulted Steam Generator Isolation	R/23, 05/13/2020	R/14, 04/12/2018
7	EMG E-3, Steam Generator Tube Rupture	R/39, 05/13/2020	R/25, 05/13/2020
3, 4, 5, 6	EMG ES-03, SI Termination	R/27, 05/13/2020	R/18, 05/13/2020
2, 6	EMG ES-11, Post LOCA Cooldown and Depressurization	R/27, 05/13/2020	R/15, 05/13/2020
6, 8	EMG ES-12, Transfer to Cold Leg Recirculation	R/24, 05/13/2020	R/17, 05/13/2020
2, 4, 5, 6, 8	EMG F-0, Critical Safety Function Status Trees	R/18, 05/13/2020	R/15, 05/13/2020
6	EMG FR-C3, Response to Saturated Core Conditions	R/8A, 04/05/2018	R/48, 04/05/2018
2	EMG FR-S1, Response to Nuclear Power Generation/ATWS	R/23B, 02/26/2019	R/13, 4/24/2015
9	OFN KE-018, Fuel Handling Accident	R/15, 07/25/2018	N/A
1, 11	OFN KJ-032, Local Emergency Diesel Startup	R/14C, 1/30/2020	N/A
10	OFN MA-038, Rapid Plant Shutdown	R/30, 05/21/2018	R/19, 03/26/2020
11	OFN NB-030, Loss of AC Emergency Bus NB01 (NB02)	R/39, 4/29/2020	N/A
12	OFN RP-017, Control Room Evacuation	On-hold Pending Approval	N/A
1, 10	OFN SK-039, Security Events	R/26, 9/17/2020	N/A
2, 7, 8, 11	STN KAT-001, Technical Support Diesel Generator Operation	R/33A, 05/09/2019	N/A
All	STN TCA-001, Manual Time Critical Action Timing	R/5, 5/19/2016	N/A
10	SYS AC-322, MSR 2nd Stage Reheat Operations	R/19, 01/17/2017	N/A
1	SYS GK-122, Manual CRVIS Lineup	R/25, 04/11/2018	N/A
1	SYS GK-123, Control Building A/C Unit Startup and Shutdown	R/36, 02/18/2019	N/A
4, 5, 6	SYS KJ-121, Diesel Generator NE01 and NE02 Lineup for Automatic Operation	R/52A, 10/26/2016	N/A
11	SYS SY-120, Sharpe Diesel Operation and Alignment to Site	R/14A, 02/20/2019	N/A

11	SYS KU-122, Energizing NB02 from Station Blackout	R/9, 01/23/2019	N/A

2.3 Analysis

2.3.1 Identification of Site-Specific Events for use in Appendix A

The rule requires that the following events which result in classification by the approved emergency action level scheme be analyzed:

1. Condition IV events as described in the Updated Safety Analysis Report
2. Station Design Basis Threat
3. Response actions for an "aircraft probable threat" in accordance with 10 CFR 50.54(hh)(1) and as discussed in RG 1.214, "Guidance for Assessment of Beyond-Design-Basis Aircraft Impacts;" and
4. Control room fire leading to evacuation and remote shutdown, as referenced in Information Notice 95-48 "Results of On-Shift Staffing Study."

The rule requires additional analyses to be performed unless justification exists that would allow the licensee to not perform them for:

1. Station Blackout (using existing USAR assumptions)
2. Appendix R Fire Response
3. SAMG Response (to the extent performed by on-shift personnel prior to augmentation)

The team verified that the fourteen events analyzed per guidance provided in the NRC Interim Staff Guidance and NEI 10-05 for Revision 0 of the OSA still applied. The events include:

1. Eight Condition IV design basis accidents from the USAR
2. Design Basis Threat and Probable Aircraft Threat
3. Station Blackout
4. Fire with control room evacuation and alternate shutdown
5. SAMG
6. Appendix R Fire Response.

It was determined that SAMG and Appendix R Fire Response are bounded by other events. Twelve events were carried forward for analysis. Appendix A to this report documents identification of the required scenarios.

The OSA was conducted by a multi-disciplined team using site procedures to determine if tasks have been sufficiently analyzed for performance by the minimum on-shift staff as designated in the Emergency Plan. Task areas analyzed included:

- Event Mitigation (EOP/AOP, other site procedures)
- Fire Response (as determined by the scenario)
- RP/Chemistry Functions (as specified in site response procedures)
- Emergency Preparedness Functions (NUREG-0654 Table B-1/ISG -01)

This part of the analysis was not designed to identify staffing deficiencies. This part of the analysis documents areas requiring further study as designated in NEI 10-05.

2.3.2 Identification of Minimum Staffing and Response Times used in Appendix B

The minimum staffing derived from procedure AP 06-002, Radiological Emergency Response Plan *(RERP),* Figure 2 Minimum Shift Staffing and Attachment D, WCGS Minimum Staffing for Emergencies (on hold pending approval), was used to develop Table 2.1 WCGS Minimum On-Shift Staffing to identify personnel to be used in the OSA.

Table 2.1 WCGS Minimum On-Shift Staffing

Position	Revised On-Shift (pending approval)
Shift Manager (SM)[1]	1
Control Room Supervisor (CRS)[1]	1
Work Control SRO (WCSRO)[2]	1
Reactor Operator (RO)	2
Nuclear Station Operator (NSO)[3]	6
Radiation Protection Technician (RP#1/RP#2)	2
Chemistry Personnel (CH)	1
Total	14
Fire Brigade[4]	5
First Aid & Rescue[5]	2
Security	Per Security Plan

[1]STA Function may be filled by SM, CRS, or an additional licensed operator qualified as STA
[2]The WCSRO position may be provided by any individual qualified as an ENS/OSC Communicator. The use of dedicated telephone circuits and the use of a wireless headset enables the WCSRO to perform ENS/OSC communicator duties and maintain an open line with the NRC on the emergency notification system. The ENS/OSC Communicator and STA are conflicting collateral duties and may not be held by the same position.
[3]The OFN KC Duty Person may be provided by a Reactor Operator (RO) or Nuclear Station Operator (NSO). The OSA identification for this position is NSO#3.
[4]Fire Brigade is a collateral duty of *5* NSOs.
[5]First Aid & Rescue is a collateral duty provided by Fire Brigade/Security.

Augmentation for RP technicians, chemistry technicians and emergency communicators is expected within 60 minutes. For the purposes of this analysis 90 minutes was used as the time period for the conduct of on-shift ERO response actions.

The minimum shift staffing complement for the OSA re-analysis was determined from Table 2.1 above. Each position was given a unique designator for inclusion in the Appendix B tables. Based on the analysis, conflicting collateral duty functions were identified as listed in Table 2.2.

Table 2.2 On-Shift Personnel Used During Appendix B Analysis

Position	OSA Identification	Primary Function	Conflicting Collateral Duties
Shift Manager (SM)[1]	SM	Mitigation & Emergency Planning	
Control Room Supervisor (CRS)[1]	CRS	Mitigation & Emergency Planning	
Work Control SRO (WC SRO)[2]	WCSRO	Mitigation	Emergency Planning
Reactor Operator (RO)	RO#1	Mitigation	
Balance of Plant (RO)	RO#2	Mitigation	
OFN KC-016 Duty Person[3]	NSO#3	Mitigation & Fire Response	
Fire Brigade Leader (NSO)	NSO#4	Mitigation	Fire Brigade[4,5]
Auxiliary Building Watch (NSO)	NSO#5	Mitigation	Fire Brigade[4,5]
Turbine Building Watch (NSO)	NSO#6	Mitigation	Fire Brigade[4,5]
Nuclear Station Operator (NSO)	NSO#7	Mitigation	Fire Brigade[4,5]
Nuclear Station Operator (NSO)	NSO#8	Mitigation	Fire Brigade[4,5]
RP Tech #1	RP#1	Control Room Technician/Access Control and Habitability	
RP Tech #2	RP#2	Job Coverage, In-plant surveys	
Chemistry Technician	CH	Control Room/Dose Assessment	

[1]STA Function may be filled by SM, CRS, or an additional licensed operator qualified as STA
[2]The use of dedicated telephone circuits and the use of a wireless headset enables the WCSRO to perform ENS/OSC communicator duties and maintain an open line with the NRC on the emergency notification system. The ENS/OSC Communicator and STA are conflicting collateral duties and may not be held by the same position.
[3]The OFN KC Duty Person may be provided by a Reactor Operator (RO) or Nuclear Station Operator (NSO). The OSA identification for this position is NSO#3.
[4]Fire Brigade is a collateral duty of *5* NSOs.
[5]First Aid & Rescue is a collateral duty provided by Fire Brigade/Security.

For the analysis, Nuclear Station Operators (NSO) listed below were given an additional collateral (Fire Brigade) duty as identified in Table 2.3 below based on their OSA Identification:

Table 2.3 Fire Brigade OSA Identification

Fire Brigade Leader (NSO)	NSO#4	Fire Brigade Leader
Auxiliary Building Watch (NSO)	NSO#5	Fire Brigade Member
Turbine Building Watch (NSO)	NSO#6	Fire Brigade Member
Nuclear Station Operator (NSO)	NSO#7	Fire Brigade Member
Nuclear Station Operator (NSO)	NSO#8	Fire Brigade Member

2.3.3 Review of Appendix B Results

Preliminary Review by Department:

- Operations –
  - For all events: NRC Communication (per NEI 10-05, this task should be treated as a continuous action per 10 CFR 50.72(c)(3) and 73.71(b)(1) which requires licensees reporting events to "maintain an open and continuous communications channel with the NRC Operations Center upon request by the NRC.") All emergency communications and notifications will be performed by one communicator. The WCSRO position was assigned both Table 2 Plant Operations & Safe Shutdown and Table 5 – Emergency Planning Implementation tasks which represent potentially conflicting functions and responsibilities. Per the guidance in NEI 10-05, A Time Motion Study is required.
  - For events requiring activation of the Fire Brigade – Five nuclear station operators, and one person to perform OFN KC-016 actions
- Radiation Protection –
  - Tasks assigned to RP personnel were analyzed in Table 4 During this analysis, no conflicts with current staffing were identified.
- Chemistry –
  - Dose Assessment assigned to the Chemistry position (CH) was analyzed in Table 4 and marked N/A in Table 5 per the guidance in NEI 10-05 Step 3.2.2.6.12. During this analysis, no conflicts with current staffing were identified.
- Security –
  - Not evaluated. Security staffing is per the Security Plan.

Evaluation of Results

Although multiple functions have been identified for some positions, only one conflict exists requiring further action. For all other positions, performance of multiple functions by identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue. The Appendix B, Event Analysis identified the Work Control SRO as the only position with potentially conflicting emergency planning responsibilities. This position was evaluated in Appendix C Time Motion Study.

2.3.4 Review of Appendix C Results

The results of the Appendix B On-Shift Staffing Analysis identified the Work Control SRO as a position with a potential conflict requiring further Time Motion Study analysis. The Work Control SRO is assigned both Plant Operations and Emergency Plan Implementation Functions during all Appendix A Events. Specifically, the Work Control SRO is assigned the task of Plant Operations (status monitoring and EOP actions) to validate proper emergency load sequencer actuation and to validate the accuracy of the plant computer upon a reactor trip using EMG F-0. This assignment in conjunction with the Emergency Plan Implementation functions of ERO Notification, Local/State Event Notification and NRC Event Notification represent potentially conflicting functions and responsibilities.

On March 24th, 2021, a Time Motion Study was conducted in the Wolf Creek Generating Station Simulator. In attendance to conduct the TMS Scenario were the following individuals in the roles listed below:

Name	**Roles**
Chad Woods	Shift Manager
Greg Perry	Work Control SRO
Bryant Askins	TMS documenter.

The results of the Time Motion Study are documented in Appendix C of this document. These results show that this ERO position's assigned responsibilities included no overlapping tasks, that the performance of the Plant Operations tasks were short in duration and that the performance of the Plant Operations tasks did not conflict with the timely performance of Emergency Planning Implementation functions assigned to the WCSRO.

3.0 References

1. **10 CFR 50.47** "Emergency Plans"
2. **10 CFR 50.54(q)** "Emergency Plans"
3. **44 CFR 350.5** "Criteria for review and approval of State and local radiological emergency plans and preparedness."
4. **10 CFR 50 Appendix E** "Emergency Planning and Preparedness for Production and Utilization Facilities"
5. **10 CFR 50 Appendix E Section IV.A.9** "Emergency Planning and Preparedness for Production and Utilization Facilities"
6. **NSIR/DPR-ISG-01**, "Interim Staff Guidance - Emergency Planning for Nuclear Power Plants"
7. **NEI 10-05** "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities"
8. **Regulatory Guide 1.219** "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors"
9. **NUREG-0654** "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants: Final Report (NUREG-0654/FEMA-REP-1, Revision 2)"
10. **ET 91-0040** WCNOC Letter to NRC dated 2/27/1991 License Amendment Request
11. Correspondence **RA-12-0130** Shift Staffing Analysis Revision 0
12. Correspondence **RA-19-0092** Shift Staffing Analysis Revision 1
13. WCNOC Updated Final Safety Analysis Report (USAR) Chapter 15 "Accident Analysis
14. **AP 06-002**, Radiological Emergency Response Plan
15. **NRG Generic Letter 86-04**, "Policy Statement on Engineering Expertise On-Shift"
16. **WCGS USAR Chapter 15** "Accident Analysis"
17. **RIS-16-10** "License Amendment Requests for Changes to Emergency Response Organization Staffing and Augmentation" published 08/05/2016
18. **Regulatory Issue Summary 2005-02** "Clarifying the Process for Making Emergency Plan Changes,"

APPENDIX A
Analyzed Events and Accidents

Analysis #	Summary Description of Event or Accident	Plant Mode	Reference Document(s)	ECL	Analysis Required?
1	Land and/or waterborne HOSTILE ACTION directed against the Protected Area by a HOSTILE FORCE. Assume adversary characteristics defined by the Design Basis Threat (DBT).	1	Safeguards Plan OFN SK-39, Security Procedures, HS1.1	Site Area Emergency	Yes
2	Steam system piping failure (major)	2	USAR § 15.1.5 &15.1.6 Table 15.0-6; APF 06-002-03, RS1.2, (TEDE> 100 mrem), based on USAR Tables 15.1-3 & 15.1-4.	Site Area Emergency	Yes
3	Feed-water system pipe break (bounded by Event#2)	1	USAR § 15.2.8 & Fig. 15.0-14; APF 06-002-03, RS1.2 Dose bounded by Postulated Steam Line break. USAR §15.2.8.3	Site Area Emergency	Yes
4	Reactor coolant pump shaft seizure (locked rotor)	1	USAR § 15.3.3 & Fig. 15.0-15; APF 06-002-03, RS1.2 (TEDE> 100 mrem), based on USAR Tables 15.3-3 & 15.3-4.	Site Area Emergency	Yes
5	Reactor coolant pump shaft break (bounded by Event #4)	1	USAR § 15.3.4 & Fig. 15.0-15; assume same radiological as #4, above, based on statement in § 15.3.4.2 that “are addressed via the locked rotor analysis described in Section 15.3.3…”	Site Area Emergency	Yes
6	Spectrum of rod cluster control assembly ejection accidents	1	USAR § 15.4.8 & Fig. 15.0-16; APF 06-002-03 RG1.2 (TEDE > 1000 mrem), based on USAR Table 15.4-4.	General Emergency	Yes

Analysis #	Summary Description of Event or Accident	Plant Mode	Reference Document(s)	ECL	Analysis Required?
7	Steam generator tube failure	1	USAR § 15.6.3 & Table 15.0-6; APF 06-002-03, FG1.1 or RG1.2 (assumes ruptured SG that's also faulted, with some failed fuel). (TEDE > 1000 mrem), See also USAR Tables 15.6-4 § III(a) & 15.6-5.	General Emergency	Yes
8	Loss-of-coolant accidents, resulting from the spectrum of postulated piping breaks within the reactor coolant pressure boundary (large break)	1	USAR § 15.6.5; Fig. 15.0-25; Tables 15.6-6 & 15.6-8; APF 06-002-03 RG1.2 (TEDE > 1000 mrem), based on Tables 15.6-6 &	General Emergency	Yes
9	Design basis fuel handling accidents	6	USAR § 15.7.4; Fig. 15.0-29 & 15.0-30; APF 06-002-03 RG1.2 (TEDE > 1000 mrem), based on Table 15.7-8	General Emergency	Yes
10	Aircraft Probable Threat – 10 CFR 50.54(hh)(1)	1	APF 06-002-03 HA1.1, Contingency Safeguards OFN SK-039, SEC 50-002	Alert	Yes
11	Station Blackout (SBO)	1	APF 06-002-03, SG1.1, 4 hour	General Emergency	Yes
12	Fire with a Control Room Evacuation and Remote Shutdown	1	APF 06-002-03, HS6.1 OFN RP-017	Site Area Emergency	Yes
13	Severe Accident Management Guidance (SAMG)*	1	Scenarios bounded by events #7 and #8, above.	N/A	No
14	Appendix R Fire Response	1	Event #12, above, is more bounding.	N/A	No

* The entry conditions for SAMG actions do not occur prior to the arrival of the augmenting ERO for any of the FSAR Category IV events or other scenarios performed within this analysis. SAMGs are implemented by the TSC.

APPENDIX B
Event Analysis

Event #1 Design Basis Threat

Narrative

This is a scenario as categorized by the NRC, which is outside the scope of the classical design basis accidents as defined by the USAR.

NEI 10-05 rev 0 (6/11), "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," describes the event as:

> *Land and/or waterborne HOSTILE ACTION directed against the Protected Area by a HOSTILE FORCE. Assume adversary characteristics defined by the Design Basis Threat (DBT).*

For this analysis, the design basis threat, per NEI 10-05, § 3.1, assumptions 5 and 7 states:

> *With respect to the DBT staffing analysis, it may be assumed that a HOSTILE FORCE breached the Protected Area fence but was neutralized with no adverse consequences to plant safety. Damage inflicted on plant systems, structures and components is not sufficient to prevent safe shutdown or cause a radiological release. There is no fire significant enough to warrant firefighting efforts prior to the arrival of offsite resources and/or the augmented ERO. The analysis should confirm that sufficient staff is available to simultaneously implement both the emergency plan and the security plan.*
>
> *…the analysis of the DBT event must account for the expected constraints on the movement of personnel (e.g., movement not allowed, limited movement using the 2-person rule, etc.). Specifically, individuals must usually be in, or readily able to respond to, assigned response locations before being credited with performing a function/task that implements the emergency plan. The inability of an individual to reach their assigned response location may introduce a collateral duty assignment to another individual.*

Operator actions start with procedure OFN SK-039, "Security Event."

OFN SK-039:

Step #1 has operator check for a hostile action declared. The normal path is followed; the protected area fence has been breached. **(SM)**

The operator goes to Attachment A, "*Response to a Hostile Action*," while continuing with this procedure.

Steps #2 and #3 have operator contact the NRC to relay information on the threat. (Abbreviated NRC notification per NEI 10-05 Table 5). **(SM/WCSRO)**

Step #4 has operator check on the nature of the threat (airborne or non-airborne-based). The normal path is followed; this is a non-airborne threat. **(SM)**

Attachment A: Response to a Hostile Action:

Step #A.1 has the operator trip the reactor and proceed procedure EMG E-0, "Reactor Trip or Safety Injection," while continuing with this procedure. **(CRS/RO#1/RO#2)**

Step #A.2 has the operator start EDGs. **(RO#2)**

Step #A.3 has an operator place the control room in CRVIS lineup **(RO#2)**

Step #A.4 has an operator manually actuating CPIS if a containment purge is in progress or any containment purge dampers are open. **(RO#2)**

Step #A.5 has an operator starting the motor driven fire pump or diesel driven fire pump. **(RO#2)**

Step #A.6 has an operator secure any surveillance or maintenance activities in progress. **(RO#2/SM)**

Step #A.7 has an operator returning safety related equipment that can be controlled from the control room to an operable status. **(RO#2)**

Step #A.8 has an operator checking to maximize makeup water sources and systems and ensure that all tanks are at their maximum level. **(RO#2/NSO#6)**

Steps #A.9 and A.10 discusses actions during a refueling outage or spent fuel handling. The plant is assumed be at full power at the start of this event, so these steps are not applicable.

Step #A.11 has operators commencing RCS cooldown to cold shutdown as soon as possible per applicable procedure once EMG ES-02, "Reactor Trip Response" is complete**. (CRS/RO#1)**

Step #A.12 has the operator return to the main procedure.

OFN SK-039: (cont.)

Step #5 checks for a bomb threat or sabotage. The normal path is that this is not the cause of the event. The normal path is followed, due to the NEI 10-05 assumptions stated earlier.

Step #6 has an operator provide "hostile action" and "take cover" announcements via the plant's telephone paging system. The plant's gai-tronics system is used if the telephone paging system doesn't work. **(SM)**

Step #7 ensures the Shift Manager determines emergency classification level. **(WCSRO)**

Step #8 coordinates personnel movements with security shift lieutenant or incident commander. **(SM)**

Step #9 direct operations crew, chemistry technician, and RP technician to report to the control room. **(SM)**

Step #10 checks all personnel expected to safely reach control room and ensure missile door is secured. **(SM)**

Step #11 has personnel dispatched through the CAS to locations as follows:

- One SRO and one NSO to the Aux shutdown panel (ASP). **(SM/NSO#5)**
- One RO or NSO to the NB switchgear room. **(RO#2/NSO#6)**

Finally, after the **RO or NSO** leave for the NB switchgear room, an operator needs to ensure the control room back stairway door has the "ultra-dog" installed. **(SM)**

Step #12 has an operator start the "A" and "B" emergency diesel generators. The RNO path for this step has the **RO or NSO** at the NB switchgear room directed to start the EDGs using procedure OFN KJ-032, "Local Emergency Diesel Startup." For this scenario, the EDGs are assumed to need manual starting, so the RNO path is followed. **(RO#1)**

OFN KJ-032:

An operator attempts to start both diesel generators **locally**. The procedure outlines manual operations to try to start emergency diesel generator A using a mallet switch, then by trying a local start pushbutton, then by trying an air start valve. A similar progression of actions is followed to start emergency diesel generator B. For this analysis, it's assumed that both emergency diesel generators do finally start. **(RO#2 or NSO#6)**

OFN SK-039: (cont.)

Step #13 directs the CAS personnel to place the Aux Shutdown panel door in locked mode. **(CRS)**

Step #14 directs an over-ride of all power block elevators, by placing key switches in the SM office to the ON position. **(CRS)**

Step #15 directs coordinating with security shift lieutenant to determine if two-person rule should be implemented. **(CRS)**

Step #16 has an operator monitor progress of the intrusion on the control room radio. The normal path assumes that the breach of the control room is not imminent, which is consistent with the scenario assumptions in NEI 10-05. **(NSO#4)**

On-site E-Plan announcements directing personnel to report to their emergency response positions are deferred until the hostile action has been terminated. **(WCSRO)**

Step #17 increases awareness of control board indicators to assess plant stability and safety system status. **(CRS/RO#1)**

Step #18 is a check to see that the security event is terminated. This is a "hold point" before continuing with step #18. **(CRS/RO#1)**

Step #19 is a check to determine if announcement to take cover has been made. **(CRS)**

Step #20 makes announcement over telephone page system that the security event has been terminated. **(CRS)**

Step #21 informs local, county, state, federal agencies of event status, as necessary. **(WCSRO)**

Step #22 makes any required E-Plan announcements**. (WCSRO)**

Step #23 ensures notifications for accountability to security is complete. **(WCSRO)**

EMG E-0:

For operator checks and actions from step #1 through step #4, this assessment does not assume additional "RNO" events occurred, since they are outside the scope of the scenario as defined by NEI 10-05.

Steps #1 – #4 identify manual operations, but no local operations and no explicit radiological hazards are listed. The intruders are assumed be neutralized at PAB fence *with no adverse consequences to plant safety*, so these steps are skipped. No safety injection actuated.

EMG ES-02: (All steps performed by remaining 2 operators in the Control room are to place the plant in a stable condition.) Completion of these actions expected to occur beyond the first 90 minutes of the event

Step #1 checks RCS temperature control. **(CRS/RO#1)**

Step #2 checks RCS cold leg temperature. **(CRS/RO#1)**

Step #3 checks main generator breakers and exciter breaker OPEN. **(CRS/RO#1)**

Step #4 checks feedwater status. **(CRS/RO#1)**

Step #5 evaluates service water/essential service water status. **(CRS/RO#1)**

Step #6 verifies instrument air compressor is running**. (CRS/RO#1)**

Step #7 verifies instrument air to containment. **(CRS/RO#1)**

Step #8 checks charging pumps, at least one running. **(CRS/RO#1)**

Step #9 checks RCP Seal Cooling Always In-service during the event **(CRS/RO#1)**

Step #10 verifies charging system aligned for normal injection. **(CRS/RO#1)**

Step #11 checks charging flow, established. **(CRS/RO#1)**
Step #12 checks all control rods, fully inserted**.** **(CRS/RO#1)**

Step #13 checks PZR level, greater than 17%. **(CRS/RO#1)**

Step #14 checks if letdown should be established. **(CRS/RO#1)**

Step #15 establishes excess letdown. **(CRS/RO#1)**

Step #16 checks PZR level control. **(CRS/RO#1)**

Step #17 checks PZR pressure, greater than 1830psig. **(CRS/RO#1)**

Step #18 checks PZR PORVs. **(CRS/RO#1)**

Step #19 checks normal spray valves. **(CRS/RO#1)**

Step #20 checks AC emergency busses energized by offsite power**.** **(CRS/RO#1)**

Step #21 checks PZR pressure heater control. **(CRS/RO#1)**

Step #22 controls PZR pressure. **(CRS/RO#1)**

Step #23 checks S/G levels. **(CRS/RO#1)**

Step #24 checks spent fuel pool status. **(CRS/RO#1)**

Step #25 checks all non-class 1E AC busses and load centers, energized by offsite power. **(CRS/RO#1)**

Step #26 establishes S/G pressure control. **(CRS/RO#1)**

Step #27 checks if RCPs should be started. **(CRS/RO#1)**

Step #28 establishes conditions for starting desired RCPs. **(CRS/RO#1)**

Step #29 starts desired RCPs. **(CRS/RO#1)**

Step #30 checks if source range detectors should be energized**.** **(CRS/RO#1)**

Step #31 shuts down unnecessary plant equipment, as directed by SM or CRS. **(CRS/RO#1)**

Step #32 checks if a diesel driven fire pump should be started**.** **(CRS/RO#1)**

Step #33 maintains stable plant conditions. **(CRS/RO#1)**

Step #34 directs senior reactor operator to perform procedure AP 20-002, “Post-Trip Review.” **(CRS/RO#1)**

Step #35 directs chemistry to perform required post trip samples, using procedure AP 02-007, “Abnormal Conditions Guidelines.” **(CRS/RO#1)**

Step #36 directs chemistry to sample RCS for boron. (**CRS/RO#1)**

Step #37 determines if natural circulation cooldown is required. **(CRS/RO#1)**

Analysis 1
Design Basis Threat
On-Shift Staffing Analysis Report
Revision 2

This On-Shift Analysis (OSA) is applicable to Analysis # 1 as identified in Appendix A. **(DBT)**

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L7 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L9 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L2	No	No

Analysis #1

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L4	No	No
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L5	No	No
6	Nuclear Station Operator #4 (NSO#4)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L6	No	No
7	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L7	No	No
8	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L8	No	No

Analysis #1

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
9	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	N/A	No	No
10	Radiation Protection Technician (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	N/A	No	No
11	Radiation Protection Technician (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	N/A	No	No
12	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown Analysis #1

One Unit – One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #4	Nuclear Station Operator #4 (FBL)	Operations Training
7	Auxiliary Operator #5	Nuclear Station Operator #5 (Aux)	Operations Training
8	Auxiliary Operator #6	Nuclear Station Operator #6 (TB)	Operations Training
9	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
10	Mechanic	N/A	N/A
11	Electrician	N/A	N/A
12	I&C Technician	N/A	N/A
13	Other	N/A	N/A

Analysis #1

TABLE 3 – Firefighting

Line	Performed By	Task Analysis Controlling Method
1	N/A – there is no fire associated with this event.	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

TABLE 4 – Radiation Protection & Chemistry

Analysis #1

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position:	N/A – Personnel on lock-down for DBT event.																	
2	On-Site Survey On-Shift Position:	N/A – Personnel on lock-down for DBT event.																	
3	Personnel Monitoring On-Shift Position:	N/A – Personnel on lock-down for DBT event.																	
4	Job Coverage On-Shift Position:	N/A – Personnel on lock-down for DBT event.																	
5	Offsite Radiological Assessment On-Shift Position:	N/A – Personnel on lock-down for DBT event.																	
6	Chemistry function/task #1 – Sampling On-Shift Position:	N/A – Personnel on lock-down for DBT event.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation

Analysis #1

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	Shift Manager	Operations Training and EP Training/Drill Program
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and Operations Training and EP Training/Drill Program

Event #2 Steam System Piping Failure (Major)

Narrative

This is one of the Design-Basis Condition IV Limiting Fault events as listed in the USAR, § 15.0.1.4, "Condition IV - Limiting Faults." USAR § 15.1.5.1, "Identification of Causes and Accident Description," states:

> *The steam release arising from a rupture of a main steam line would result in an initial increase in steam flow that decreases during the accident as the steam generator pressure decreases.*
>
> *The energy removal from the RCS causes a reduction of coolant temperature and pressure. In the presence of a negative moderator temperature coefficient, the cooldown results in an insertion of positive reactivity. If the most reactive RCCA is assumed stuck in its fully withdrawn position after reactor trip, there is* [a] *possibility that the core will become critical and return to power. A return to power following a steam line rupture is a potential problem mainly because of the high power peaking factors which exist, assuming the most reactive RCCA to be stuck in its fully withdrawn position. The core is ultimately shut down by the boric acid solution delivered by the emergency core cooling system.*

A detailed discussion of potential accidents in this category, including analytical methods used and the scenario consequences expected, can be found in USAR § 15.1.5, "Steam System Piping Failure," and are diagrammed in USAR Figure 15.0-10, "Depressurization of Main Steam System."

An analysis performed by the WCGS staff has concluded that the most serious consequences occur for:

> *…the largest double-ended steamline rupture at end-of-life, hot zero-power (Mode 2) conditions, with the most reactive RCCA in the fully withdrawn position, bounds all other power levels and other Modes for the post-trip phase of the transient.*

Which signals cause the reactor trip depends on the location of the rupture, as outlined in USAR § 15.1.5.1, "Identification of Causes and Accident Description."

There is a potential for one category of piping failure to vent outside of containment. Assuming a 1 gpm leak rate from the
primary to secondary cooling system, noble gas inventory equivalent to 1% failed fuel and a pre-accident iodine spike as described in USAR § 15.1.5.2, "Analysis of Effects and Consequences":

a. *End-of-life shutdown margin at no-load, equilibrium xenon conditions, with the most reactive RCCA stuck in its fully withdrawn position. Operation of the control rod banks throughout core burnup during each operating cycle is restricted by the insertion limits so that addition of positive reactivity following a steam line break accident will not lead to a more adverse condition than the case analyzed.*

b. *A negative moderator coefficient corresponding to the end-of-life rodded core with the most reactive RCCA in the fully withdrawn position.*

c. *Minimum capability for injection of boron solution corresponding to the most restrictive single failure in the safety injection system.*

d. *The following cases have been considered in determining the core power and RCS transients:*

   1. *Complete severance of a pipe, with the plant initially at no-load conditions, full reactor coolant flow with offsite power available.*

   2. *Case(1) above, but with loss of offsite power simultaneous with the steam line break. Loss of offsite power results in reactor coolant pump coast down.*

e *Power peaking factors corresponding to one stuck RCCA and non-uniform core inlet coolant temperatures are determined at end of core life. The coldest core inlet temperatures are assumed to occur in the sector with the stuck rod. The power peaking factors account for the effect of the local void in the region of the stuck RCCA during the return to power phase following the steam line break.*

Given the above assumptions and conditions and USAR § 15.1.5.3.2, "Identification of Uncertainties and Conservatisms in the Analysis," the sequence as described in USAR § 15.1.5.3.1.1, "Physical Model," involves:

The radiological consequences of a MSLB inside the containment are less severe than the one outside the containment because the radioactivity released will be held up inside the containment, allowing decay and plate out of the radionuclides. To evaluate the radiological consequences due to a postulated MSLB outside the containment, it is assumed that there is a complete severance of a main steam line outside the containment.

It is also assumed that there is a simultaneous loss of offsite power, resulting in reactor coolant pump coast down. The safety injection system is actuated and the reactor trips.

The main steam line isolation valves, their bypass valves, and the steam line drain valves isolate the steam generators and the main steam lines upon a signal initiated by the engineered safety features actuation system under the conditions of high steam negative pressure rate or low steam line pressure. The main steam isolation valves are installed in the main steam lines from each steam generator downstream from the safety and atmospheric relief valves outside the containment. The break in the main steam line is assumed to occur outside of the containment. The affected steam generator (steam

generator connected to a broken steam line) blows down completely. The steam is vented directly to the atmosphere.

In case of loss of offsite power, the remaining steam generators are available for dissipation of core decay heat by venting steam to the atmosphere via the atmospheric relief valves. Venting continues until the reactor coolant temperature and pressure have decreased sufficiently so that the RHR system can be utilized to cool the reactor.

As summarized in USAR Tables 15.1-3, "Parameters Used in Evaluating the Radiological Consequences of a Main Steam Line Break," and 15.1-4, "Radiological Consequences of a Main Steam Line Break":

For evaluating the radiological consequences due to a postulated MSLB, the activity released from the faulted steam generator (steam generator connected to the broken steam line) is released directly to the environment. The unaffected steam generators are assumed to continually discharge steam and entrained activity via the safety and atmospheric relief valves up to the time initiation of the RHRS can be accomplished.

Since the activity is released directly to the environment with no credit for plateout or retention, the results of the analysis are based on the most direct leakage pathway available. Therefore, the resultant radiological consequences represent the most conservative estimate of the potential integrated dose due to the postulated MSLB.

Referring back to APF 06-002-03, the radiological consequences classify this event as RS1.2, (TEDE> 100 mrem), based on USAR Tables 15.1-3 & 15.1-4 escalates the classification to a **Site Area Emergency**.

The event as diagrammed in USAR Figure 15.0-10, "Depressurization of Main Steam System," is assumed to cause a reactor trip either at hot zero power or hot full power. For this assessment, it is assumed that procedure EMG E-0, "Reactor Trip or Safety Injection," was the entry point for operator actions.

EMG E-0:

Step #1 verifies reactor trip**. (RO#1)**

Step #2 verifies turbine trip. **(RO#2)**

Step #3 checks that at least one of the AC emergency busses is energized. **(RO#1)**

Step #4 checks if safety injection is actuated. **(RO#1)**

Step #5 checks if SI is required. **(RO#1)**

Step #6 verifies automatic actions using Attachment F, Automatic Signal Verification. **(RO#1)**

Step #7 checks main generator breakers and exciter breaker open. **(RO#2)**
Step #8 checks total AFW flow is greater than 270,000 lbm/hr**. (RO#2)**

Step #9 checks RCS cold leg temperatures. **(RO#2)**

Step #10 establishes S/G pressure control. **(RO#2)**

For steps #11 - #13, the normal path is followed. USAR Figure 15.1-22, "Pressurizer Pressure and Pressurizer Water Volume vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available," shows a rapid drop in volume for the first 20 seconds and a rapid drop in pressure for the first 60 seconds, stabilizing at an RCS pressure of approximately 1000 psia and a liquid volume less than 50 ft^3. As noted above, a pressurizer valve failure is outside the scope of this event. **(RO#2)**

Step #14 follows the normal path. The reactor coolant pumps tripped when the reactor tripped. **(RO#2)**

Step #15 directs the operator to monitor the critical safety functions using EMG F-0, "Critical Safety Function Status Trees (CSFST)", based on "safety injection has not been terminated and no accident condition has been identified". **(SM/CRS/WCSRO)**

EMG F-0: **(SM/CRS/WCSRO)**

USAR Figure 15.1-21, "Nuclear Power and Core Heat Flux for SLB Transient at HZP without Offsite Power Available" shows that Nuclear Power (Fraction of Nominal) climbing from minimal to greater than 5% within 300 seconds after the event, due to positive reactivity insertion via borated moderator in the aftermath of the cooldown of the RCS from the steam line break. This scenario was also described in USAR § 15.1.5.1 "Identification of Causes and Accident Description" as described above. The reactor is going through a re-criticality. This puts the operator into a potential RED PATH via critical safety function status tree F-01, Subcriticality.

The re-criticality causes a jump from EMG F-0 to EMG FR-S1, "Response to Nuclear Power Generation/ATWS."

EMG FR-S1:

Step #1 verifies reactor trip. **(RO#1)**

Step #2 verifies turbine trip. **(RO#2)**

Step #3 verifies AFW pumps running. **(RO#2)**

Step #4 checks main generator breakers and exciter breaker open. **(RO#2)**

Step #5 checks SI – not in progress. **(RO#1)**

Step #6 initiates emergency boration of RCS**. (RO#1)**

Step #7 verifies charging flow path. **(RO#1)**

Step #8, checks for emergency borate flow greater than 30 gpm. There is an RNO path to go to this procedure's "Attachment A" if the RWST flow through the charging system is less than 90 gpm. **(RO#1)**

RO#1 and NSO#5 will be branched to Att. A. Rest of crew will continue in EMG FR-S1 at step #9 proceeding through the procedure using Step #13 as a continuous action to get to step #25 when **RO#1 and NSO#5** are successful. The crew may complete all or part of steps #9 - #25 in this time; it depends on how quickly **RO#1 and NSO#5** can complete their tasks. Ultimately the crew will arrive at step #25 using the continuous action from step #13 and continue through EMG FR-S1 and back to EMG E-0. It is expected that the **CRS and RO#2** will not have progressed beyond step #13 before **RO#1 and NSO#5** return from Att. A.

Attachment A, "Establishing Alternate Boration Flowpath," has step #A2, "Open Boric Acid to Boric Acid Blending Tee Valve". The RNO path has an operator **locally** fail open the valve by isolating the instrument air to the valve and then venting air pressure from the valve. **(NSO#5)**

Step #A6 verifies that boration flow is greater than 30 gpm. The RNO path has an operator continue with the steps in Attachment A. The normal path reverts back to the procedure mainline at step #9. **(RO#1)**

Step #A7, "Establish Manual Boration," has a normal path step to **locally** unlock and open the boric acid to charging pump suction isolation valve. There is a remark in the basis document that "**High dose could exist for local operator actions.**" The RNO path for this sub-step is to continue to step #A8. **(RO#1/NSO#5)**

Continuing the sub-steps in step #A7, the normal path is to check for normal boration flow. The RNO path is to jump to step #A9. If both of these sub-steps follow the normal path, the operator reverts back to the procedure mainline at step #9. **(RO#2)**

Step #A8, "Establish Manual Emergency Boration," has a normal path step to **locally** open the emergency borate to charging pump suction valve. There is a remark in the basis document that "**High dose could exist for local operator actions.**" If the step is successful, the operator reverts back to the procedure mainline at step #9. The RNO path is to continue to step #A9, which can be bypassed until additional staff arrive beyond the first 90 minutes of the event. **(RO#1/ NSO#5)**

Step #A10, "Check if Alternate Boration Flow has been Established," has a normal path to verify flow is greater than 30 gpm and an RNO path to continue efforts to raise the flow rate to that level. **(RO#1/NSO#5)**

Step #A11 reverts back to the procedure mainline at step #9.

Steps #9 - #12 follows the normal path (the RNO path assumes additional problems outside the scope of the event). **(RO#2)**

Step #13 is a check to ensure the reactor is subcritical. Based on the description of this event, the boration action is assumed to eventually succeed in bringing the reactor subcritical, as outlined in USAR Table 15.1-1, "Time Sequence of Events for Incidents That Result in an Increase in Heat Removal by the Secondary System," sheet #2, "Steam System Piping Failure," case #2, "concurrent loss of offsite power". The RWST boron solution starts reaching the core in 366.5 seconds. USAR Figure 15.1-21, "Nuclear Power and Core Heat Flux for SLB Transient at HZP without Offsite Power Available" shows the power starts decreasing within 400 seconds. Once the reactor has been successfully brought subcritical, the procedure jumps to step #25. **(RO#1)**

Step #25 is assumed to follow the normal path (the RNO path assumes additional problems outside the scope of this event). **(RO#1)**

Step #25 has the operator continue boration until adequate shutdown margin is achieved. **(RO#1)**

Step #26 is a check on the CRDM fans, to keep the CRDMs below 165ºF. The RNO path has an operator manually start the fans. **(RO#2)**

Step #27 reverts back to the procedure EMG E-0, step #16. **(CRS)**

EMG E-0:

Step #16 checks to see if any (or all) of the steam generators are faulted. Based on USAR Figures 15.1-25, "Feedwater Flow and Steam Flow vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available ," and 15.1-26, "Steam Pressure and Core Flow vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available," there are sharp differences in the behavior of S/Gs with intact loops vs. faulted loops. Intact loops stabilize pressure; the faulted loop continues to drop pressure. Since there is a double-ended break in a large steam line, this is a failure in the secondary pressure boundary. The procedure has the operator jump to procedure EMG E-2, "Faulted Steam Generator Isolation." **(RO#2)**

EMG E-2:

EMG E-2, step #1 has the operator check to see if the steam lines on all S/Gs are isolated. This involves ensuring the main steam line valves, bypass valves and low point drain valves are closed. The RNO path has manual operations, but no local operations were identified. **(RO#2)**

Step #2 has the operator check to see if limitations for fault in Area 5 are required (which will depend on where the break is located). The procedure adds a **warning** to **local operators** in the affected area. **(RO#2/NSO#6)**

Step #3 checks to see if any S/Gs are not faulted. Based on the scenario for this event, S/Gs that are not connected to the broken main steam line are not faulted. **(RO#2)**

Step #4 identifies S/Gs that are faulted. The normal path has "any S/G pressures decreasing in an uncontrolled manner" OR "any S/G completely depressurized," which is consistent with USAR Figures 15.1-25 and 15.1-26. **(RO#2)**

Step #5 isolates the faulted S/Gs. The normal path involves closing the AFW flow controls to the faulted S/Gs. The RNO path has an operator **locally isolate** the affected lines. The Turbine Driven AFW pump always has the steam supply line **locally closed** by the operator. The S/G atmospheric relief valves (ARVs) on the faulted S/Gs are checked closed, and the RNO path has an operator **locally isolate** the affected S/G ARVs. **(RO#2/NSO#5/NSO#6)**

Step #6 addresses isolating feedwater lines. The RNO path for this section involves manual closure of valves. If manual closure of valves also fails, then a subsequent RNO path has a dispatch operator isolate valves **locally.** The valves in question are the main feedwater reg valves, the main feedwater reg bypass valves and the main feedwater chemical injection valves. **(RO#2/NSO#5)**

Step #7 covers isolation of blowdown and sampling lines. There is an RNO path to **locally** isolate the affected blowdown and/or sampling line(s) for the affected S/Gs. **(RO#2)**

Step #8 discusses situations where the pressurizer PORV opens due to high pressure. For the event described, the RCS pressure drops with the cooldown and the pressurizer empties 18 seconds into the event (see USAR Table 15.1-1, sheet #2, as described above). The event follows the normal path. **(RO#1)**

Step #9 discusses continued uncontrolled cooldown. The core inlet temperature for the intact loops and the core average temperature start to stabilize after the first 40 seconds of the event. See USAR Figure 15.1-23, "Reactor Vessel Inlet Temperature and Core Average Temperature vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available." The normal path is followed, based on the accident description. **(RO#2)**

Step #10 has specific **extreme caution statements** regarding performing **local surveys** if the steam lines in Area 5 of the Aux Building are not intact, if there is a need to establish a sampling capability to determine secondary radiation levels**. Radiation protection** is directed to **locally survey** the steam lines in this area. **Chemistry** is directed to **sample** all S/Gs for activity. In this case, per the scenario, no steam generator tubes are ruptured. **(CRS/RO#2)**

Step #11, on the RNO path, involves using an operator to **locally** open the ESW A or B to air compressor, to insure instrument air compressors are available to supply air to instruments and to restore instrument air to the containment. **(RO#2/NSO#5)**

Step #12 checks for intact S/G tubes. Based on the scenario, the S/G tubes are intact and the operator follows the normal path. **(RO#2/RP#1)**

Step #13 checks if containment spray should be stopped**. (RO#2)**

Step #14 checks for ECCS flow. The operator follows the normal path and jumps to EMG E-1, "Loss of Reactor or Secondary Coolant." **(RO#1/RO#2)**

Procedure EMG E-1 is entered into after the faulted S/G has been identified and isolated.

EMG E-1:

Step #1 checks if RCPs should be stopped. If a loss of offsite power has not occurred RCS pressure is checked. In this scenario, the RCS pressure drops below 1400 psi within the first 40 seconds, causing the operator to stop RCPs with at least one ECCS pump running. See USAR Figure 15.1-22, "Pressurizer Pressure and Pressurizer Water Volume vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available," top graph, for more details. **(RO#1)**

The S/Gs are specifically checked in step #2. Based on the scenario, the assumption is the operations in the previously executed EMG E-2 procedure, listed above, have already succeeded in isolating the faulted S/G. The operator follows the normal path. **(RO#2)**

Steps #3 - #5 follow the normal path, based on the scenario description. The RNO path would require assuming additional problems with the S/Gs beyond the scope of the event. **(RO#1/RO#2)**

The caution before step #6 echoes the earlier specific **extreme caution statements** on performing **local surveys** if the steam lines in Area 5 of the Aux Building are not intact. Step #6 has **radiation protection performing surveys** and **chemistry performing sampling** of all S/Gs for activity. **(CRS/RO#2/RP#1)**

Step #7 continues the **local surveys (in Control Room)** to check secondary radiation levels. This scenario assumes that no SGTR occurred, so operators follow the normal path. **(RO#2/RP#1)**

Step #8 involves the pressurizer, which is assumed to be functioning in accordance with the scenario described and USAR Figure 15.1-22, "Pressurizer Pressure and Pressurizer Water Volume vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available." No stuck PORVs, failed heaters, malfunctioning sprays, etc. are assumed. **(RO#1)**

Step #9 has the same RNO path discussion on **locally** opening ESW A or B to air compressor as was described above. **(RO#2/NSO#5/NSO#6)**

Steps #10 - #12 do not involve local operations. **(RO#1/RO#2)**

Step #13 is a check on RCS Pressure. RCS pressure and pressurizer level are stable after the first 100 seconds, based on USAR Figure 15.1-22. The normal path is followed. **(RO#2)**

Step #14 is a check on RCS and S/G pressures. **(RO#2)**

Step #15 discusses availability of offsite power. In this case, the assumption is there is no offsite power, so the RNO path is followed. **(RO#2)**

Step #16 has **local** operations to reset and close the boric acid transfer pump breakers and the emergency borate valve breaker. **(NSO#5/NSO#6)**

Steps #17 **(RO#2)** and #18 **(RO#2/NSO#7)** involve closing battery charger breakers and checking busses and load centers energized by offsite power. The event assumes there is no onsite power available. Step #18's RNO path is followed.

Step #19 (place hydrogen analyzers in service) has no local operations identified. This event does not assume core damage beyond the 1% failed fuel, noble gas release and iodine spike as described earlier. **(RO#1)**

Step #20 involves verifying the Cold Leg Recirculation Capacity, but this accident doesn't assume a LOCA. The normal path is followed. **(RO#2)**

Step #21 checks the fuel/auxiliary building radiation levels to assure there is no primary leakage into the aux building. This accident does not assume primary leakage beyond the 1 gpm primary to secondary rate as was described earlier. The normal path is followed, which includes directing **radiation protection** to survey the **fuel and aux buildings**. **(RO#2/RP#1)**

Step #22 requests **chemistry** obtain **boron and activity samples** for the RCS and pressurizer liquid space. **(CRS)**

Step #23 evaluates plant status. The event does not assume additional malfunctions, so the normal path is followed. **(SM/CRS)**

Step #24 has the RCS pressure > 325 psig per USAR Figure 15.1-22. This triggers a move to procedure EMG ES-11, "Post LOCA Cooldowns and Depressurization", since the RCS pressure is greater than the shutoff head pressure of the RHR pumps. (Note that the initiating event here is a steamline break causing loss of secondary coolant, not a LOCA on the primary side). **(RO#1)**

Continuing with EMG ES-11, step #1:

EMG ES-11:

Steps #1 and #2 reset the SI and Containment Isolation Phase A and B. **(RO#1/RO#2)**

Step #3 and 4 has an RNO path to **locally** open ESW A or ESW B to the Air Compressor, reset and close breaker reset switches, and **dispatch an operator** to reset alarms and restart compressors. There are also actions to **locally** open the instrument air supply containment isolation valve. This is the same RNO path discussion on **locally** opening ESW A or B to air compressor, as was described in procedure EMG E-2, above. **(RO#2)**

Step #5 checks on whether the diesel generators should be shut off. The scenario assumes a loss of offsite power, so the emergency diesel generators need to keep running. Follow the RNO path. **(RO#2)**

Step #6 is an alignment of the pressurizer heaters. **(RO#1)**

Step #7 requires **local reset and close** of the boric acid transfer pump breakers and the emergency borate valve breaker. **(RO#2/NSO#5/NSO#6)**

Step #8 is to close the Non-Class 1E battery charger breakers, to re-energize equipment. **(RO#2)**

Step #9 - This event assumes loss of offsite power, so the RNO path is taken for Site Watch to start the TSC diesel using procedure STN KAT-001, "Technical Support Diesel Generator Operation." **(RO#2)**

STN KAT-001:

Operator **locally** performs the prerequisite checks listed in § 7, "Prerequisites." **(NSO#7)**

Operator **locally** performs § 8.1, "Testing Installed TSC Diesel Generator," **OR** § 8.2, "Testing Temporary TSC Diesel Generator." **(NSO#7)**

Note that if the TSC Diesel Generator runs for more than an hour, refer to Attachment B, "TSC Diesel Generator Reading", or if applicable, Attachment C, "TSC Temporary Diesel Generator Readings," for hourly checks on the diesel generator in question. **(NSO#7)**

EMG ES-11 (continued):

Step #10 checks if RHR pumps are running. The RCS pressure is > 325 psig (see discussion, above), so the pumps should not be running. (However, later they will need to be started manually per the basis document). The operator continues to step #10. **(RO#2)**

Step #11 checks for intact S/G levels. The intact S/Gs are expected to behave normally, per the event description. The faulted S/G should have been resolved earlier in this procedure. None of the S/Gs has a tube rupture. The operator follows the normal path. **(RO#2)**

Step #12 – Check if condenser air removal should be returned to normal. In this case, we had a steamline break with isolation, and loss of offsite power. The condenser is assumed unavailable, so the operator follows the RNO path and continues to step #12. **(RO#2)**

Step #13 checks for blocking safety injection signals. The RCS pressure drops below 1970 psig within 30 seconds of the event and continues rapidly dropping to approximately 900 psig within 80 seconds of the event, as shown in USAR Figure 15.1-22, top graph. The normal path is followed. **(RO#1)**

Termination path (expected actions are beyond the first 90 minutes of the event):

Step #14 Initiates RCS cooldown to cold shutdown: The initial cooldown of approximately 80 °F occurs in the first 50 seconds of the event, as shown in USAR Figure 15.1-23. The steam dump occurs using the intact S/G ARVs, given the loss of offsite power. **(CRS/RO#2)**

EMG FR-S1: (continued)

Step #A9, "Locally Check Boric Acid Filter ΔP – Less than 20 psid," has a normal path step to check pressure differential on the boric acid filter, and an RNO path to conduct a series of valve manipulations, with **maintenance** to change boric acid filter ASAP. There is a remark in the basis document that "High dose could exist for local operator actions."

The operators continue along the termination path listed in procedure EMG ES-11 until reactor is in stable cold shutdown.

Analysis 2
Steam System Piping Failure (Major)
On-Shift Staffing Analysis Report
Revision 2

This OSA is applicable to Analysis # 2 as identified in Appendix A. **(Steam System Piping Failure)**

Analysis #2

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L9 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L2	No	No
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L4	No	No
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L5	No	No

Analysis 2
Steam System Piping Failure (Major)
On-Shift Staffing Analysis Report
Revision 2

Analysis #2

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
6	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L6	No	No
7	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L7	No	No
8	Nuclear Station Operator #7 (NSO#7)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L8	No	No
9	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L5 T4/L6	No	No
10	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L1 T4/L3	No	No
11	Radiation Protection Technician (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L4	No	No
12	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown Analysis #2

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #5	Nuclear Station Operator #5 (Aux)	Operations Training
7	Auxiliary Operator #6	Nuclear Station Operator #6 (TB)	Operations Training
8	Auxiliary Operator #7	Nuclear Station Operator #7 (FBM)	Operations Training
9	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
9	Mechanic	N/A	N/A
10	Electrician	N/A	N/A
11	I&C Technician	N/A	N/A
12	Other	N/A	N/A

Analysis #2

TABLE 3 – Firefighting

Line	Performed By	Task Analysis Controlling Method
1	N/A – there is no fire associated with this event.	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

TABLE 4 – Radiation Protection & Chemistry

Analysis #2

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position: RP Tech #1 Main Steam Line Survey							X	X	X	X	X							
2	On-Site Survey On-Shift Position:	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure.																	
3	Personnel Monitoring On-Shift Position: RP Tech #1	X	X	X	X	X	X						X	X	X	X	X	X	X
4	Job Coverage On-Shift Position: RP Tech #2.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling is required until the Technical Support Center is staffed per AP 15C-003.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes

RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

Analysis #2

TABLE 5 – Emergency Plan Implementation

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this event	N/A
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and Operations Training and EP Training/Drill Program

Event #3 Feedwater System Piping Break

Narrative

This is one of the Design-Basis Condition IV Limiting Fault events as listed in the USAR, § 15.0.1.4, "Condition IV - Limiting Faults". USAR § 15.2.8.1, "Identification of Causes and Accident Description," states:

> *A major feedwater line rupture is defined as a break in a feedwater line large enough to prevent the addition of sufficient feedwater to the steam generators to maintain shell side fluid inventory in the steam generators. If the break is postulated in a feedwater line between the check valve and the steam generator, fluid from the steam generator may also be discharged through the break. Further, a break in this location could preclude the subsequent addition of auxiliary feedwater to the affected steam generator. (A break upstream of the feedwater line check valve would affect the NSSS only as a loss of feedwater)…*
>
> *Depending upon the size of the break and the plant operating conditions at the time of the break, the break could cause either an RCS cooldown (by excessive energy discharge through the break) or an RCS heatup. Potential RCS cooldown resulting from a secondary pipe rupture is evaluated in Section 15.1.5* [as described above]. *Therefore, only the RCS heatup effects are evaluated for a feedwater line rupture…*
>
> *The main feedwater control system is assumed to fail due to an adverse environment. The water levels in all steam generators are assumed to decrease equally until the low-low steam generator level reactor trip setpoint is reached. After reactor trip, a double-ended rupture of the largest feedwater line is assumed. These assumptions conservatively bound the most limiting feedwater line rupture that can occur. Analyses have been performed at full power, with and without loss of offsite power, and with no credit taken for the pressurizer power-operated relief valves but no SI actuation modeled. For the case without offsite power available, the power is assumed to be lost at the time of reactor trip. This is more conservative than the case where power is lost at the initiation of the event.*

A detailed discussion of possible accidents in this category, analytical methods used and consequences assessed can be found in USAR § 15.2.8, "Steam System Piping Failure," and are diagrammed in USAR Figure 15.0-14, "Major Rupture of a Main Feedwater Line."

Document APF 06-002-03, EAL Classification Matrix, shows that the above event would not result in a classifiable event without further degradation of the plant. Radioactivity doses from the postulated feedwater lines rupture are less than those previously presented for the postulated steam line break and are therefore bounded by a **Site Area Emergency** through the Rad Effluent tree **(RS1.2)**.

The event as diagrammed in USAR Figure 15.0-14 is assumed to generate a reactor trip from full power. For this assessment, it is assumed that procedure EMG E-0, "Reactor Trip or Safety Injection" was the entry point for operator actions. EMG E-0 is followed through step #16, when a jump to procedure EMG E-2, "Faulted Steam Generator Isolation," occurs. Other paths (e.g., EMG E-2, § 2, "Symptoms or Entry Conditions") are available; most of those listed assume an actual steam generator tube *rupture* occurred, or assume that *all* of the steam generators are uncontrollably losing pressure. EMG E-1, "Loss of Reactor or Secondary Coolant," was also

reviewed. In step #2 of EMG E-1, the RNO path sends the operator to EMG E-2 if the faulted feedline cannot be isolated.

EMG E-0:

For operator checks and actions from step #1 through step #16, this assessment does not assume additional "RNO" events occurred which are outside the scope of the USAR description (e.g., an ATWS, an un-trippable turbine, etc.).

Steps #1 – #7 identify manual operations, but no local operations and no explicit radiological hazards are listed. For some steps, if a manual closure of valves also fails, then a subsequent RNO path step has valves operated **locally. (NSO#4** depending on step and location.)

Step #1 verifies reactor trip. **(RO#1)**

Step #2 verifies turbine trip. **(RO#2)**

Step #3 checks AC emergency busses – at least one energized. **(RO#1)**

Step #4 checks if safety injection is actuated. **(RO#1)**

Step #5 checks if SI is required. **(RO#1)**

Step #6 verifies automatic actions using Attachment F, Automatic Signal Verification. **(RO#1)**

Step #7 checks main generator breakers and exciter breaker – open. **(RO#2)**

Step #8 checks total AFW flow >270,000 lbm/hr. The RNO path for this event involves manual operations described in Attachment F, "Automatic Signal Verification". Control manipulations are identified, with the RNO paths to attempt to manually close specified valves. **(RO#2)**

Steps #9 and #10 checks RCS cold leg temperatures and establish steam generator (SG) pressure control. There are no specific instructions requiring local operator actions. **(RO#2)**

For steps #11 - #13, the normal path is followed. USAR Figure 15.1-22, "Pressurizer Pressure and Pressurizer Water Volume vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available," shows a rapid drop in volume for the first 20 seconds and a rapid drop in pressure for the first 60 seconds, stabilizing at an RCS pressure of approximately 1000 psia and a liquid volume less than 50 ft^3. As noted above, a pressurizer valve failure is outside the scope of this event. **(RO#2)**

Step #14 follows the normal path. The reactor coolant pumps tripped when the reactor tripped. **(RO#2)**

Step #15 directs an operator to monitor Critical Safety Functions using EMG F-0, "Critical Safety Function Status Trees."
(SM/CRS/WCSRO)

Step #16 checks to see if "S/Gs Are Not Faulted." The RNO path (which reflects this narrative) sends the operator to EMG E-2, "Faulted Steam Generator Isolation," step #1. **(RO#2)**

EMG E-2:

Step #1 has the operator check to see if the steam lines on all S/Gs are isolated. This involves ensuring the main steam line valves, bypass valves and low point drain valves are closed. The RNO path has manual operations, but no local operations were identified. **(RO#2)**

Step #2 has the operator check to see if limitations for fault in Area 5 are required (which will depend on where the break is located). The procedure adds a warning to local operators in the affected area. **(RO#2/NSO#6)**

Step #3 checks to see if any S/Gs are <u>not</u> faulted. Based on the scenario for this event, S/Gs that are not connected to the broken main steam line are not faulted. **(RO#2)**

Step #4 identifies S/Gs that are faulted. The normal path has "any S/G pressures decreasing in an uncontrolled manner" OR "any S/G completely depressurized", which is consistent with USAR Figures 15.1-25 and 15.1-26. **(RO#2)**

Step #5 isolates the faulted S/Gs. The normal path involves closing the AFW flow controls to the faulted S/Gs. The RNO path has an operator locally isolate the affected lines. The Turbine Driven AFW pump always has the steam supply line locally closed by the operator. The S/G atmospheric relief valves (ARVs) on the faulted S/Gs are checked closed, and the RNO path has an operator locally isolate the affected S/G ARVs. **(RO#2/NSO#5/NSO#6)**

Step #6 addresses isolating feedwater lines. The RNO path for this section involves manual closure of valves. If manual closure of valves <u>also</u> fails, then a subsequent RNO path has a dispatch operator isolate valves locally. The valves in question are the main feedwater reg valves, the main feedwater reg bypass valves and the main feedwater chemical injection valves. **(RO#2/NSO#5)**

Step #7 covers isolation of blowdown and sampling lines. There is an RNO path to locally isolate the affected blowdown and/or sampling line(s) for the affected S/Gs. **(RO#2)**

Step #8 discusses situations where the pressurizer PORV opens due to high pressure. For the event described, the RCS pressure drops with the cooldown and the pressurizer empties 18 seconds into the event (see USAR Table 15.1-1, sheet #2, as described above). The event follows the normal path. **(RO#1)**

Step #9 discusses continued uncontrolled cooldown. The core inlet temperature for the intact loops and the core average temperature start to stabilize after the first 40 seconds of the event. See USAR Figure 15.1-23, "Reactor Vessel Inlet Temperature and Core Average Temperature

vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available". The normal path is followed, based on the accident description. **(RO#2)**

Step #10 has specific extreme caution statements regarding performing local surveys if the steam lines in Area 5 of the Aux Building are not intact, if there is a need to establish a sampling capability to determine secondary radiation levels. Radiation protection is directed to locally survey the steam lines in this area. Chemistry is directed to sample all S/Gs for activity. In this case, per the scenario no steam generator tubes are ruptured. **(CRS/RO#2/RP#1)**

Step #11, on the RNO path, involves using an operator to locally open the ESW A or B to air compressor, to insure instrument air compressors are available to supply air to instruments and to restore instrument air to the containment. **(RO#2/NSO#5)**

Step #12 checks for intact S/G tubes. Based on the scenario, the S/G tubes are intact and the operator follows the normal path. **(RO#2/RP#1)**

Step #13 checks if containment spray should be stopped. **(RO#2)**

Step #14 checks for ECCS flow. The operator follows the normal path and jumps to procedure EMG E-1 or EMG ES-03. **(RO#1/RO#2)**

EMG ES-03:

Neither the normal path steps nor the RNO steps appear to cause **local operator** issues to "be in play" unless other complications outside the scope of the narrative occur. Steps #14, "Control Charging Flow to Maintain PZR Level Greater than 6% [33%]" and #15, "Check if SI Pumps Should be Stopped" have specific RNO "do not continue" commentary based on faulted S/Gs. **(RO#1/RO#2/NSO#5/NSO#6)**

EMG E-1:

Procedure EMG E-1 is entered into after the faulted S/G has been identified and isolated, as noted in "Symptom or Entry Conditions" item #2.5. The S/Gs are specifically checked in step #2, where the jump to the previously discussed EMG E-2 occurs.

Steps #1-5 – **RO#1/RO#2**

The caution box before step #6 has the same specific **extreme caution** statements regarding performing local surveys if the steamlines in Area 5 of the Aux Building are not intact as were identified earlier. Step #6 has **health physics performing surveys** in this area and **chemistry sampling** all S/Gs for activity. **(CRS/RO#2/RP#1)**

Step #7 continues to check for radiation affecting the secondary side of the coolant system. **(RO#2)**

Step #8 involves checking the pressurizer PORVs and block valves. The normal path is followed. **(RO#1/NSO#4)**

Step #9 has the same RNO path discussion on **locally** opening ESW A or B to air compressor, as noted above. **(RO#1/NSO#5/NSO#6)**

Step #10 verifies instrument air to containment. **(RO#1)**

At step #11, for this scenario (feedwater break without additional complications outside the scope of the analyzed design basis event), the operator jumps to procedure EMG ES-03, "SI Termination," Step #1. **(RO#1/RO#2)**

EMG ES-03:

Steps #1/2 reset ESFAS signals to allow for component repositioning. **(CRS/RO#1)**

Steps #3/4 establish Instrument Air and aligns it to Containment. **(CRS/RO#2)** Steps

#5/6/7 reduces charging flow rates to 1 CCP **(CRS/RO#1)**

Steps #8/9/10 establish CCW flow to Containment (**CRS/RO#2)**

Steps #11- 15 Establish normal charging and secure BIT Flow **(CRS/RO#1)**

Steps #16-18 Secures remaining ECCS Pumps and determine if SI is still not needed. **(CRS/RO#2)**

Termination path (expected actions are beyond the first 90 minutes of the event):

The longer-term closure to this event is assumed to involve completion of procedure EMG ES-03, "SI Termination".

If a LOCA should occur during the termination path, the procedure EMG ES-11, "Post-LOCA Cooldown and Depressurization" may be invoked.

Analysis 3
Feedwater System Piping Break
On-Shift Staffing Analysis Report
Revision 2

This On-Shift Analysis (OSA) is applicable to Analysis # 3 as identified in Appendix A. **(Feedwater System Piping Break)**

Analysis #3

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L9 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L2	No	No

Analysis #3

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L4	No	No
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L5	No	No
7	Nuclear Station Operator #4 (NSO#4)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L6	No	No
8	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L7	No	No

Analysis #3

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
9	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L8	No	No
10	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L5 T4/L6	No	No
11	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L1 T4/L3	No	No
12	Radiation Protection Technician #2 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L4	No	No
13	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown

Analysis #3

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #4	Nuclear Station Operator #4 (Aux)	Operations Training
7	Auxiliary Operator #5	Nuclear Station Operator #5 (TB)	Operations Training
8	Auxiliary Operator #6	Nuclear Station Operator #6 (FBM)	Operations Training
9	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
9	Mechanic	N/A	N/A
10	Electrician	N/A	N/A
11	I&C Technician	N/A	N/A
12	Other	N/A	N/A

Analysis #3

TABLE 3 – Firefighting

Line	Performed By	Task Analysis Controlling Method
1	N/A – there is no fire associated with this event.	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

TABLE 4 – Radiation Protection & Chemistry

Analysis #3

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position: RP Tech #1 Main Steam Line Survey							X	X	X	X	X							
2	On-Site Survey On-Shift Position:	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure.																	
3	Personnel Monitoring On-Shift Position: RP Tech #1	X	X	X	X	X	X						X	X	X	X	X	X	X
4	Job Coverage On-Shift Position: RP Tech #2.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling is required until the Technical Support Center is staffed per AP 15C-003.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation Analysis #3

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this Event	N/A
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and Operations Training and EP Training/Drill Program

Event #4 Reactor Coolant Pump Shaft Seizure (Locked Rotor)

Narrative

This is one of the Design-Basis Condition IV Limiting Fault events as listed in the USAR, § 15.0.1.4, "Condition IV - Limiting Faults." USAR § 15.3.3.1, "Identification of Causes and Accident Description," states:

> *The accident postulated is an instantaneous seizure of a reactor coolant pump rotor, as discussed in Section 5.4. Flow through the affected reactor coolant loop is rapidly reduced, leading to an initiation of a reactor trip on a low flow signal.*
>
> *Following initiation of the reactor trip, heat stored in the fuel rods continues to be transferred to the coolant, causing the coolant to expand. At the same time, heat transfer to the shell side of the steam generators is reduced - first, because the reduced flow results in a decreased tube side film coefficient, and then, because the reactor coolant in the tubes cools down while the shell side temperature increases (turbine steam flow is reduced to zero upon plant trip). The rapid expansion of the coolant in the reactor core, combined with reduced heat transfer in the steam generators, causes an insurge into the pressurizer and a pressure increase throughout the RCS. The insurge into the pressurizer compresses the steam volume, actuates the automatic spray system, opens the power-operated relief valves, and opens the pressurizer safety valves, in that sequence. The two power-operated relief valves are designed for reliable operation and would be expected to function properly during the accident. However, for conservatism, their pressure-reducing effect, as well as the pressure-reducing effect of the spray, are not included in the analysis.*

A detailed discussion of possible accidents in this category, analytical methods used, and consequence analysis can be found in USAR § 15.3.3, "Reactor Coolant Pump Shaft Seizure (Locked Rotor).

The USAR § 15.3.3.2, "Analysis of Effects and Consequences," elaborates on the conditions assumed for the accident:

> *At the beginning of the postulated locked rotor accident, i.e., at the time the shaft in one of the reactor coolant pumps is assumed to seize, the plant is assumed to be in operation under the most adverse steady state operating conditions, i.e., maximum guaranteed steady state thermal power, maximum steady state pressure, and maximum steady state coolant average temperature. Plant characteristics and initial conditions are further discussed in Section 15.0.3.*
>
> *For the peak pressure evaluation, the initial pressure is conservatively set at 50 psi above nominal pressure (2,250 psia) to allow for errors in the pressurizer pressure measurement and control channels. This is done to obtain the highest possible rise in the coolant pressure during the transient. The maximum RCS pressure is located at the reactor vessel lower plenum.*

USAR Tables 15.3-1, "Time Sequence of Events for Incidents Which Result in a Decrease in Reactor Coolant System Flow Rate," and 15.3-2, "Summary of Results for Locked Rotor Transients," outline the accident sequence.

USAR § 15.3.3.3, "Radiological Consequences," assesses:

> *The instantaneous seizure of a reactor coolant pump rotor results in a reactor trip on a low coolant flow signal. With the coincident loss of offsite power, the condensers are not available, so the excess heat is removed from the secondary system by a steam dump through the steam generator safety and atmospheric relief valves. Steam generator tube leakage is assumed to continue until the residual heat removal system can match decay heat and releases from the secondary system are terminated. The reactor coolant will contain the gap activities of the fraction of the fuel which undergoes DNB in addition to its assumed equilibrium activity.*

More specifically, as described in USAR § 15.3.3.3.1.2, "Assumptions and Conditions":

- *Offsite power is lost.*
- *Following the incident, secondary steam is released to the environment for heat removal. The total quantity of steam released is given in Table 15.3-3.*
- *Primary-to-secondary leakage continues after the accident for a period of 12 hours. At that time, the residual heat removal system has matched decay heat removal and releases from the secondary system are terminated. The leakage rate is assumed to be constant and equal to 1 gpm (500 lbs/hr).*
- *Fission products released from the fuel-cladding gap of the damaged fuel rods are assumed to be instantaneously and homogeneously mixed with the reactor coolant.*
- *The noble gas activity released is equal to the amount present in the reactor coolant, which leaks into the secondary system after the accident.*
- *The iodine activity present in the primary to secondary leakage is assumed to mix homogeneously with the iodine activity initially present in the steam generators.*
- *A partition factor of 0.01 between the vapor and liquid phases for radioiodine in the steam generators is utilized to determine iodine releases to the environment via steam venting from the steam generators.*
- *The activity released from the steam generators is immediately vented to the environment.*

The radiological source term is summarized in USAR Tables 15.3-3, "Parameters Used in Evaluating the Radiological Consequences of a Locked Rotor Accident," and 15.3-4, "Radiological Consequences of a Locked Rotor Accident." The loss of offsite power provides an external pathway for release of radioactive material, as noted in USAR § 15.3.3.3.2, "Identification of Uncertainties and Conservative Elements in the Analysis":

> *The coincident loss of offsite power with the occurrence of a reactor coolant pump locked rotor is a highly conservative assumption. In the event of the availability of offsite station power, the condenser steam dump valves will open, permitting steam dump to the condenser. Thus there is no direct release to the environment.*

A detailed discussion of the models used is located in USAR Appendix 15A, "Accident Analysis Radiological Consequences Evaluation Models and Parameters." USAR Table 15.3-4 projects a thyroid dose of 420 millirem at the exclusion area boundary.

Based on radiological consequences, Document APF 06-002-03, EAL Classification Matrix, classifies the above as **Site Area Emergency** based on RS1.2, "Dose assessment using actual meteorology indicates doses > 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the SITE BOUNDARY."

The event as summarized in USAR Table 15.3-1, Sheet #2, is assumed to generate a reactor trip from full power due to "Low RCS Flow in One Loop." The event is also assumed to cause the pressurizer safety valves to open to relieve RCS pressure. For this assessment, it is assumed that procedure EMG E-0, "Reactor Trip or Safety Injection," was the entry point for operator actions.

The USAR Table 15.3-2, "without offsite power" column, gives a maximum clad temperature at the core hot spot of 1,787 °F (affecting 0.29 % of the $Zr{\bullet}H_20$ by weight). USAR Figure 15.3-19, "Peak Clad Temperature, Locked Rotor with and without Offsite Power," shows that for localized area of the core the peak occurs 4 seconds into the incident and then decreases to 1,400 °F within 16 more seconds. USAR Figure 15.3-18, "Core Average Water Temperature Locked Rotor With and without Offsite Power," shows that, in the "without offsite power" case, the core temperature is back to "pre-event" levels within 8 seconds. The combination suggests increased activity in the core but no sustained temperature rise.

EMG E-0:

For <u>procedure E-0,</u> following the operator checks and actions from step #1 through step #10, this assessment does <u>not</u> assume additional "RNO" events that are outside the scope of the USAR description (e.g., ATWS, un-trippable turbines, etc.). **(CRS/RO#1/RO#2)**

Step #1 verifies reactor trip. **(RO#1)**

Step #2 verifies turbine trip. **(RO#2)**

Step #3 checks AC emergency busses – at least one energized. **(RO#1)**

Step #4 checks if safety injection is actuated. **(RO#1)**

Step #5 checks if SI is required. **(RO#1)**

Step #6 verifies automatic actions using Attachment F, Automatic Signal Verification. **(RO#1)**

Step #7 checks main generator breakers and exciter breaker – open. **(RO#2)**

Step #8 checks total AFW flow > 270,000 lbm/hr. **(RO#2)**

Step #9 checks RCS cold leg temperatures. **(RO#2)**

Step #10 establishes S/G pressure control. **(RO#2)**

Step #11 has the operator checking the status of the pressurizer PORVs (which the above scenario assumes have opened to deal with the pressure transient when one of the reactor coolant pumps had a rotor lock, but are functioning properly). **(RO#2)** The RNO path for being unable to close the PORVs is to use and monitor procedure EMG F-0, "Critical Safety Function Status Trees (CSFST)," **(SM/CRS/WCSRO)** and then to procedure EMG E-1, "Loss of Reactor or Secondary Coolant." **(RO#2)**

Step #12 has the operator check normal PZR spray valves closed. **(RO#2)**

Step #13 has the operator check PZR safety valves closed. **(RO#2)**

(Again, the scenario assumes that the Pressurizer Safety Values will operate properly for the duration of the accident).

Step #14 checks that the reactor coolant pumps are off. **(RO#2)**

At step #15, the operator is directed to monitor procedure EMG F-0. The procedure EMG E-0 continues while the Critical Status Function Status Tree (CSFST) is monitored. **(SM/CRS/WCSRO)**

Step #16 has the operator check for faulted steam generators. (For the RNO path, see the above section, "Feed-water System Pipe Break," for more details). Faulted steam generators are not part of the scenario being analyzed here. **(RO#2)**

Step #17 has the operator check if the steam generator tubes are intact. For this scenario, we're assuming a primary to secondary leak of 1 gallon/minute with the coolant having some elevated activity due to the "hot spot" and localized cladding failure. This is the RNO step that would direct to ES-03. **(RO#2)**

Step #18 has the operator check if RCS is intact in containment**. (CRS/RO#1)**

Step #19 has the operator check if ECCS flow should be reduced. **(CRS/RO#1)**

Step #20 has the operator reset SI. **(RO#1)**

Step #21 has the operator reset containment isolation phase A and B. **(RO#1)**

The possibility of a loss of offsite power during this event is within the scope of this event. Steps #22 - #23 on the RNO path, involves using an operator to **locally** open the ESW A or B to air compressor valves, in order to ensure instrument air compressors are available to supply air to instruments and to restore instrument air to the containment. An operator may also be dispatched to **locally** reset alarms and restart air compressors as needed. **(RO#2/NSO#5/NSO#6)**

Step #24 involves checking steam generator levels (again, this scenario assumes a one gallon per minute leakage from the primary to secondary, but no other issues with the steam generators). **(RO#2)**

Step #25 is a repeat of the actions of Step #17. **(RO#2/RP#1)**

Steps #26 through #28 are assumed to be conducted on the "normal" path. **(RO#1/RP#1)**

Step #29 involves checking if the diesel generators should be stopped (e.g., is there offsite power available yet?). Procedure SYS KJ-I2I, "Diesel Generator NE01 and NE02 Lineup for Automatic Operation" is called out on the normal path, while continuing procedure E-0. The diesel generator procedure does have **local** actions (annunciator panel checks, oil level checks, governor speed checks, valve manipulations, etc.) called out throughout the document. **(RO#2/NSO#6)**

Step #30 involves an operator **locally** resetting the boric acid transfer pump breakers and the emergency borate valve breakers. **(RO#1/NSO#5/NSO#6)**

Steps #31 through #33 are assumed to be conducted on the "normal" path. Step #34 loops back to step #9, "Check RCS Cold Leg Temperatures." **(RO#1/NSO#4)**

The operator continues looping through the procedure until the step #20, "Check If ECCS Flow Should be Reduced" can be answered with the action "Go to EMG ES-03, SI Termination, step #1."

EMG ES-03:

Steps #1/2 reset ESFAS signals to allow for component repositioning. (**CRS/RO#1)**

Steps #3/4 establish Instrument Air and aligns it to Containment**. (CRS/RO#2)** Steps

#5/6/7 reduces charging flow rates to 1 CCP (**CRS/RO#1)**

Steps #8/9/10 establish CCW flow to Containment **(CRS/RO#2)**

Steps #11- 15 Establish normal charging and secure BIT Flow **(CRS/RO#1)**

Steps #16-18 Secures remaining ECCS Pumps and determine if SI is still not needed. (**CRS/RO#2)**

Termination path (expected actions are beyond the first 90 minutes of the event):

The longer-term closure to this event is assumed to involve completion of procedure EMG ES-03, "SI Termination".

If a LOCA should occur during the termination path, the procedure EMG ES-11, "Post-LOCA Cooldown and Depressurization" may be invoked.

Analysis 4
Reactor Coolant Pump Shaft Seizure (Locked Rotor)
On-Shift Staffing Analysis Report
Revision 2

This On-Shift Analysis (OSA) is applicable to Analysis # 4 as identified in Appendix A **(Reactor Coolant Pump Shaft Seizure)** Analysis #4

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L9 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L2	No	No

Analysis #4

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L4	No	No
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L5	No	No
7	Nuclear Station Operator #4 (NSO#4)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L6	No	No
8	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L7	No	No

Analysis #4

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
9	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L8	No	No
10	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L5 T4/L6	No	No
11	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L1 T4/L3	No	No
12	Radiation Protection Technician #2 (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L4	No	No
13	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown Analysis #4

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #4	Nuclear Station Operator #4 (FBL)	Operations Training
7	Auxiliary Operator #5	Nuclear Station Operator #5 (Aux)	Operations Training
8	Auxiliary Operator #6	Nuclear Station Operator #6 (TB)	Operations Training
9	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
9	Mechanic	N/A	N/A
10	Electrician	N/A	N/A
11	I&C Technician	N/A	N/A
12	Other	N/A	N/A

TABLE 3 – Firefighting Analysis #4

Line	Performed By	Task Analysis Controlling Method
1	N/A – there is no fire associated with this event.	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

TABLE 4 – Radiation Protection & Chemistry

Analysis #4

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position: RP Tech #1 Main Steam Line Survey							X	X	X	X	X							
2	On-Site Survey On-Shift Position:	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure.																	
3	Personnel Monitoring On-Shift Position: RP Tech #1	X	X	X	X	X	X						X	X	X	X	X	X	X
4	Job Coverage On-Shift Position: RP Tech #2.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling is required until the Technical Support Center is staffed per AP 15C-003.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation Analysis #4

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this event	N/A
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and Operations Training and EP Training/Drill Program

Event #5 Reactor Coolant Pump Shaft Break (Bounded by Event #4)

Narrative

The USAR § 15.3.4.1, "Identification of Causes and Accident Description," states:

> *The accident is postulated as an instantaneous failure of a reactor coolant pump shaft, as discussed in Section 5.4. Flow through the affected reactor coolant loop is rapidly reduced, though the initial rate of reduction of coolant flow is greater for the reactor coolant pump rotor seizure event. Reactor trip is initiated on a low flow signal in the affected loop.*
>
> *Following initiation of the reactor trip, heat stored in the fuel rods continues to be transferred to the coolant, causing the coolant to expand. At the same time, heat transfer to the shell side of the steam generators is reduced - first, because the reduced flow results in a decreased tube side film coefficient and then because the reactor coolant in the tubes cools down while the shell side temperature increases (turbine steam flow is reduced to zero upon plant trip). The rapid expansion of the coolant in the reactor core, combined with reduced heat transfer in the steam generators, causes an insurge into the pressurizer and a pressure increase throughout the RCS. The insurge into the pressurizer compresses the steam volume, actuates the automatic spray system, opens the power-operated relief valves, and opens the pressurizer safety valves, in that sequence. The two power-operated relief valves are designed for reliable operation and would be expected to function properly during the accident. However, for conservatism, their pressure-reducing effect, as well as the pressure-reducing effect of the spray, are not included in the analysis.*

The document continues, in USAR § 15.3.4.2, "Conclusions":

> *The consequences of a reactor coolant pump shaft break are addressed via the locked rotor analysis described in Section 15.3.3. With a failed shaft, the impeller could conceivably be free to spin in a reverse direction as opposed to being fixed in position as in the locked rotor incident. However, the locked rotor analysis described in Section 15.3.3 accounts for the shaft break incident by allowing the faulted loop's impeller to spin in the reverse direction.*

Thus, the analysis for this accident is considered bounded by the above analysis for the Reactor Coolant Pump Shaft Seizure (Locked Rotor) accident (Event #4).

Event #6 Spectrum of Rod Cluster Control Assembly Ejection Accidents

Narrative

This is one of the Design-Basis Condition IV Limiting Fault events as listed in the USAR, § 15.0.1.4, "Condition IV - Limiting Faults". The USAR § 15.4.8.1, "Identification of Causes and Accident Description," states:

> *This accident is defined as the mechanical failure of a control rod mechanism pressure housing, resulting in the ejection of an RCCA and drive shaft. The consequence of this mechanical failure is a rapid positive reactivity insertion and system depressurization together with an adverse core power distribution, possibly leading to localized fuel rod damage.*

A detailed discussion of possible accidents in this category, analytical methods used, and consequence analysis can be found in USAR § 15.4.8, "Spectrum of Rod Cluster Control Assembly Ejection Accidents", and are diagrammed in USAR Figure 15.0-21, "Rupture of Control Rod Drive Mechanism Housing".

The USAR § 15.4.8.2, "Analysis of Effects and Consequences," elaborates on the conditions assumed for the accident:

> *The values for ejected rod worths and hot channel factors are calculated. No credit is taken for the flux flattening effects of reactivity feedback. The calculation is performed for the maximum allowed bank insertion at a given power level, as determined by the rod insertion limits. Adverse xenon distributions are considered in the calculation.*
>
> *The minimum design shutdown margin available for this plant at hot zero power (HZP) may be reached only at end-of-life in the equilibrium cycle. This value includes an allowance for the worst stuck rod and adverse xenon distribution, conservative Doppler and moderator defects, and an allowance for calculational uncertainties. Physics calculations for this plant have shown that the effect of two stuck RCCAs (one of which is the worst ejected rod) is to reduce the shutdown by about an additional 1 percent Δk. Therefore, following a reactor trip resulting from an RCCA ejection accident, the reactor will be subcritical when the core returns to HZP.*
>
> *It is assumed that fission products are released from the gaps of all rods experiencing DNB. In all cases considered, less than 10 percent of the rods experienced the DNB. Although limited fuel melting at the hot spot was predicted for the full power cases, in practice melting is not expected since the analysis conservatively assumed that the hot spots before and after ejection were coincident.*

USAR Table 15.4-1, "Time Sequence of Events for Incidents Which Result in Reactivity and Power Distribution Anomalies," Sheet #2, provides information on the timing for Rod cluster control assembly ejection accidents. Tables 15.4-2, "Parameters Used in the Analysis of the Rod Cluster Control Assembly Ejection Accident," and 15.4-3, "Parameters Used in Evaluating the RCCA Ejection Accident," elaborate further on the chain of events for this scenario.

USAR §15.4.8.3, "Radiological Consequences," assesses:

> *Prior to the accident, it is assumed that the plant has been operating with simultaneous fuel defects and steam generator tube leakage for a time sufficient to establish equilibrium levels of activity in the reactor coolant and secondary systems.*
>
> *The RCCA ejection results in reactivity being inserted to the core which causes the local power to rise. In a conservative analysis, it is assumed that partial cladding failure and fuel melting occurs. The fuel pellet and gap activities are assumed to be immediately and uniformly released within the reactor coolant or containment depending on which release path is being considered*
>
> *The activity released to the containment from the reactor coolant through the ruptured control rod mechanism pressure housing is assumed to be mixed instantaneously throughout the containment and is available for leakage to the atmosphere. The only removal processes considered in the containment are radioactive decay and leakage from the containment.*
>
> *The model for the activity available for release to the atmosphere from the relief valves assumes that the release consists of the fraction of the activity leaking from the reactor coolant through the steam generator tubes. The leakage of reactor coolant to the secondary side of the steam generator continues until the residual heat removal system can match decay heat and steam releases from the steam generators are terminated. After this time, no more releases to the environment occur.*

The USAR § 15.4.8.3.1.2, "Assumptions and Conditions," makes a number of major assumptions regarding the radiological releases, including:

- *10 percent of the fuel rod gap activity, for iodine and noble gas and 12 percent of the fuel rod gap activity for alkali metal is released to the reactor coolant.*
- *0.25 percent of the fuel is assumed to melt.*
- *Following the incident until RHR operation to take over decay heat removal at 12 hours, secondary steam is released to the environment.*
- *Offsite power is assumed lost.*

There are three release pathways for this accident, per USAR § 15.4.8.3.1.4, "Identification of Leakage Pathways and Resultant Leakage Activity":

1. *Direct steam dump to the atmosphere through the secondary system relief valves for the secondary steam*
2. *Primary-to-secondary steam generator tube leakage and subsequent steam dump to the atmosphere through the secondary system relief valves*

3. *The resultant activity released to the containment is assumed available for leakage directly to the environment.*

Radiological consequences for the worst-case scenario (RCCA Ejection Accident with no offsite power) are described in USAR Tables 15.4-3 (discussed above) and 15.4-4, "Radiological Consequences of a Rod-Ejection Accident." For the worst-case accident, occurring at "Hot Full Power," (HFP) near the beginning or ending of core life, the exclusion boundary is projected at 1,200 mREm (TEDE).

Document APF 06-002-03, EAL Classification Matrix, classifies the rod ejection accident as a **General Emergency** based on **RG1.2**, "Dose assessment using actual meteorology indicates doses > 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond the SITE BOUNDARY."

The event is assumed to generate a reactor trip from full power, based on the USAR § 15.4.8.2.2, "Calculation of Basic Parameters," statement:

> …r*eactor protection for a rod ejection is provided by high neutron flux trip (high and low setting) and high rate of neutron flux increase trip*.

The event has also caused a LOCA, based on the statement:

> *Depressurization calculations have been performed for a typical four-loop plant, assuming the maximum possible size break (2.75-inch diameter) located in the reactor pressure vessel head. The results show a rapid pressure drop and a decrease in system water mass due to the break. The safety injection system is actuated on low pressurizer pressure within 1 minute after the break. The RCS pressure continues to drop and reaches saturation (1,200 psi) in about 2 to 3 minutes. Due to the large thermal inertia of primary and secondary systems, there has been no significant decrease in the RCS temperature below no-load by this time…*

EMG E-0:

Step #1 verifies reactor trip. **(RO#1)**

Step #2 verifies turbine trip**. (RO#2)**

Step #3 checks AC emergency busses – at least one energized**. (RO#1)**

Step #4 checks if safety injection is actuated. **(RO#1)**

Step #5 checks if SI is required**. (RO#1)**

Step #6 verifies automatic actions using Attachment F, Automatic Signal Verification. **(RO#1)**

Step #7 checks main generator breakers and exciter breaker – open. **(RO#2)**

Step #8 checks total AFW flow > 270,000 lbm/hr. **(RO#2)**

Step #9 checks RCS cold leg temperatures. **(RO#2)**

Step #10 establishes S/G pressure control. **(RO#2)**

For steps #11 - #13, the normal path is followed. USAR Figure 15.1-22, "Pressurizer Pressure and Pressurizer Water Volume vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available," shows a rapid drop in volume for the first 20 seconds and a rapid drop in pressure for the first 60 seconds, stabilizing at an RCS pressure of approximately 1000 psia and a liquid volume less than 50 ft^3. As noted above, a pressurizer valve failure is outside the scope of this event. **(RO#2)**

Step #14 follows the normal path. The reactor coolant pumps tripped when the reactor tripped. **(RO#2)**

Step #15 directs the operator **(SM/CRS/WCSRO)** to monitor the critical safety functions using procedure EMG F-0, "Critical Safety Function Status Trees (CSFST)," based on "safety injection has not been terminated and no accident condition has been identified".

Step #16 checks if S/Gs are not faulted. **(RO#2)**

Step #17 checks if S/G tubes are intact. **(RO#2)**

Step #18 checks if RCS is intact in containment. **(RO#1)**

EMG E-1:

Step #1 checks if the RCPs have been stopped. The scenario has the RCPs tripped when the reactor tripped, with the loss of offsite power. Follow the RNO path and go to step #2. **(RO#2)**

Step #2 checks if the S/Gs are faulted. This is a repeat of procedure EMG E-0, step #16. The operator follows the normal path. **(RO#2)**

Step #3 checks if the S/Gs are intact (e.g., are not ruptured). **(RO#2)**

Step #4 has the operator reset the safety injection (SI), and Step #5 has the operator reset the containment isolation phase A and B. **(RO#1/RO#2)**

Step #6 determines the secondary radiation levels. One sub-step has radiation protection survey steam lines in Area 5 of the Auxiliary Building, which was already to have been started in procedure E-0, step #17. **(RO#2/RP#1)**

Step #6, sub-step (e), opens all S/G sample isolation valves. At that point, **chemistry** is directed to **sample all S/Gs** for activity. **(CRS/RO#2/RP#1)**

Step #7 is a check on the secondary radiation levels. No local actions were identified. **(RO#2/RP#1)**

Step #8 checks pressurizer PORV valves, which are assumed in this scenario to be acting normally. The loss of RCS pressure is due to a double-ended guillotine break in the cold leg, not due to a pressurizer valve lifting. The pressurizer valves remained closed and the RCS pressure has rapidly dropped below 2185 psig. Accumulator injection occurred 14-19 seconds into the event, as noted in USAR Table 15.6-10, "Time Sequence of Events for Loss-Of-Coolant Accidents." **(RO#1)**

Step #9 verifies instrument air alignment. This scenario assumes a loss of offsite power at the beginning of the LOCA. The RNO path involves using an operator to **locally** open the ESW A or B to air compressor valves, in order to insure instrument air compressors are available to supply air to instruments and to restore instrument air to the containment.

An operator may also be dispatched to **locally** reset alarms, restart air compressors and open instrument air supply containment isolation valves as needed. **(RO#2/NSO#5/NSO#6)**

Step #10 verifies instrument air to containment**.** **(RO#2)**

Step #11 checks to see if the ECCS flow should be reduced. In this scenario, the RCS has blown down to the bottom of the core and is re-filling. Much of the initial RCS inventory has flashed to steam, heating and pressurizing the containment building. The RCS pressure is rapidly decreasing. The operator goes to step #12. **(RO#1)**

Step #12 checks to see if the containment sprays should be stopped. The spray pumps are assumed to be running, and the containment pressure is between 3 psig and 60 psig. (Per USAR Figure 6.2.1-6 has the containment pressure at 27 psig and decreasing at 1000 seconds. This step is assumed to follow the normal path. If 2 or more of the 4 available containment fan coolers are running in emergency mode, only one running spray pump will be required. As noted in USAR § 6.2.1.4.3.2, "Input Parameters and Assumptions," the containment fan coolers are operable using power from the emergency diesel generators. **(RO#2)**

Step #13 checks if RHR pumps should be stopped. The RHR pumps should continue running, as the RCS has blown down to the bottom of the core and is re-filling. The operator follows the normal path. **(RO#2)**

Step #14 checks the RCS and S/G Pressures. The RCS pressure is stable or decreasing due to the large double-ended guillotine break in the cold leg. The S/G pressures are not decreasing in an uncontrolled manner. The operator follows the normal path. **(RO#1/RO#2)**

Step #15 checks whether the diesel generators should be stopped. This scenario assumes that there was a loss of offsite power when the event started. Operators will try to restore offsite

power to NB01 and NB02, but until that is successful, the emergency diesel generators will be kept running and loaded to their respective busses. **(RO#2)**

Step #16 has an operator **locally** reset and close the boric acid transfer pump breakers and the emergency borate valve breaker. **(RO#1/NSO#5/NSO#6)**

Step #17 has the operator close the non-class 1E battery charger breakers. **(RO#2)**

Step #18 involves checking for the availability of offsite power. The RNO path is to "try to restore offsite power using applicable SYS procedure(s)." One of the additional RNO sub-steps involves energizing the TSC diesel using procedure STN KAT-001, while this procedure continues. **(RO#2/NSO#7)**

Moving to procedure EMG ES-12 will happen at some point but is based on the situation not the step being performed.

EMG ES-12: ***(CRS/RO#1)***

In EMG ES-12, there is a **cautionary warning** that switchover to recirculation may cause **high radiation in the Auxiliary Building**. **(NSO#5/RP#1)**

Step #2 on the RNO path, has an operator **locally open** the CCW to RHR heat exchanger valves, **if radiation levels permit**. **(NSO#5/RP#1)**

Step #3, the RNO path, has an operator **locally close** the Fuel Building A & B SFP heat exchanger room valves, **if radiation levels permit. (NSO#5/RP#1)**

The EMG ES-12 scenario does not have local operations listed until Step #7. At that step, the RNO path for closing the RHR train hot leg recirculation values is to have an operator **locally close** the Aux Building RHR Train A&B hot leg recirculation valves, **if radiation levels permit. (NSO#5/RP#1)**

Steps #7- #10, has RNO paths for an operator to **locally manipulate, if radiation levels permit** any or all of the following: **(NSO#5/RP#1)**

- Close both RHR Train Hot Leg Recirc Valves
- Isolate SI Pump Miniflow to RWST
- Align CCP and SI Pump Suctions to RHR Pump Discharge
- Isolate RWST from Charging and SI

Step #11 checks if the Phase A and Phase B containment isolation and the containment sprays can be reset. The RNO path skips to Step #15, "Verify Flow Path from Sump to RCS." **(RO#1)**

Steps #12 - #16 do not have any local operator actions listed. The RNO path for step #15 assumes there aren't any flow paths from the containment sump at all, which would put the reactor into procedure EMG C-11, "Loss of Emergency Coolant Recirculation." Such an event is well beyond the design basis accident assessed here. **(RO#1)**

Step #17 opens breakers for both CCP suction from RWST valves. **(NSO#6)**

Step #18 records time of fuel pool heat exchanger CCW isolation in control room log. There are no local operator actions. **(RO#1)**

Step #19 monitors ECCS leakage – normal. **(RO#2/NSO#5)**

Step #20 determines if transfer to hot leg recirc will be required. **(CRS)**

Step #21 initiates refill of RWST. **(RO#1/NSO#5)**

Step #22 verifies ECCS pumps not affected by sump blockage**. (RO#1)**

Step #23 returns the operator to the procedure step in effect. **(CRS)**

Analysis 6
Spectrum of Rod Cluster Control Assembly Ejection Accidents
On-Shift Staffing Analysis Report
Revision 2

This On-Shift Analysis (OSA) is applicable to Analysis #6 identified in Appendix A **(Spectrum of Rod Cluster Control Assembly Ejection Accidents)**

Analysis #6

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L9 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L2	No	No

Analysis #6

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L4	No	No
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L5	No	No
6	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L6	No	No
7	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L7	No	No

Analysis #6

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
8	Nuclear Station Operator #7 (NSO#7)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L8	No	No
9	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L5 T4/L6	No	No
10	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L1 T4/L3	No	No
11	Radiation Protection Technician #2 (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L4	No	No
12	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown

Analysis #6

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #5	Nuclear Station Operator #5	Operations Training
7	Auxiliary Operator #6	Nuclear Station Operator #6	Operations Training
8	Auxiliary Operator #7	Nuclear Station Operator #7	Operations Training
9	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
9	Mechanic	N/A	N/A
10	Electrician	N/A	N/A
11	I&C Technician	N/A	N/A
12	Other	N/A	N/A

TABLE 3 – Firefighting

Analysis #6

Line	Performed By	Task Analysis Controlling Method
1	N/A – there is no fire associated with this event.	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

TABLE 4 – Radiation Protection & Chemistry

Analysis #3

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position: RP Tech #1 Main Steam Line Survey							X	X	X	X	X							
2	On-Site Survey On-Shift Position:	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure.																	
3	Personnel Monitoring On-Shift Position: RP Tech #1	X	X	X	X	X	X						X	X	X	X	X	X	X
4	Job Coverage On-Shift Position: RP Tech #2.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling is required until the Technical Support Center is staffed per AP 15C-003.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation Analysis #6

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this event	N/A
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and Operations Training and EP Training/Drill Program

Event #7 Steam Generator Tube Failure

Narrative

This is one of the Design-Basis Condition IV Limiting Fault events as listed in the USAR, § 15.0.1.4, "Condition IV - Limiting Faults." USAR § 15.6.3.1.1, "Identification of Causes and Accident Description," states:

> *The accident examined is the complete severance of a single steam generator tube. The accident is assumed to take place at power with the reactor coolant contaminated with fission products corresponding to continuous operation with a limited number of defective fuel rods. The accident leads to an increase in the contamination of the secondary system due to the leakage of radioactive coolant from the RCS. Loss of off-site power is assumed to occur coincident with reactor trip. Discharge of activity to the atmosphere takes place via the steam generator safety and/or atmospheric relief valves.*
>
> *Following the occurrence of the SG tube rupture, the primary to secondary leakage causes the pressurizer level and the RCS pressure to decrease. As the RCS pressure continues to decrease, automatic reactor trip occurs on low pressurizer pressure or over-temperature delta-T(OT Δ T) signal. Because of the assumed loss of offsite power, the steam dump system will not be available, and the secondary side pressure increases rapidly after reactor trip until the steam generator ARVs and/or SV lift to dissipate the energy. After reactor trip, the RCS pressure continues to decrease and the safety injection is automatically initiated on low pressurizer pressure signal. Due to the assumed loss of offsite power at the reactor trip, normal feedwater flow is terminated and the AFW is initiated.*
>
> *The analysis assumes failure of the AFW control valve on the discharge side of the motor-driven AFW pump feeding the ruptured steam generator. It is assumed that this valve fails in the wide-open position to maximize the flow to the ruptured steam generator. Failure of this valve coupled with the contribution from the turbine-driven AFW*

A detailed discussion of possible accidents in this category, analytical methods used and consequences assessed can be found in USAR § 15.6.3, "Steam Generator Tube Rupture (SGTR)," and are diagrammed in USAR Figure 15.0-24, "Steam Generator Tube Rupture":

> *The steam generator tube rupture (SGTR) examined is the complete severance of one single steam generator tube which results in the leakage of reactor coolant into the secondary side of the steam generator. The consequences of SGTR depend largely upon the ability of the operator to take the necessary actions to terminate the primary to secondary leakage.*

The margin to overfill SGTR scenario assumes failures in the auxiliary feedwater (AFW) system such that if operators do not respond quickly enough to terminate feedwater, then the affected steam line may fill with water. The specific failure involves the control valve on the discharge side of the motor driven feedwater pump feeding the ruptured steam generator. To maximize flow to the ruptured steam generator, it is assumed that this valve fails in the wide-open position. Failure of this valve, coupled with the contribution from the turbine driven AFW pump, has the potential for overfilling the ruptured steam generator and subsequently, relieve water via a safety valve.

It has been determined that the most severe radiological consequences will result from the scenario with a stuck-open ARV on the ruptured steam generator.

USAR § 15.6.3.3.1.2, "Assumptions and Limitations," models the radiological source term given the following:

- *The total break flow to the ruptured steam generator is listed in Table 15.6-4*
- *It is assumed that all of the iodine and alkali metals in the fraction of reactor coolant that flashes to steam upon reaching the secondary side is released to the steam phase. No credit is taken for scrubbing.*
- *A 1-gpm primary-to-secondary leakage is assumed to occur to the intact steam generators, through the accident sequence.*
- *All noble gas activity in the reactor coolant that is transported to the secondary system via the tube rupture and the primary-to-secondary leakage is released to the atmosphere.*
- *The iodine partition fraction between the liquid and steam in the steam generator is assumed to be 0.01.*

The sequence of events for this accident are summarized in USAR Table 15.6-1, "Time Sequence of Events for Incident Which Results in a Decrease in Reactor Coolant Inventory," using the section labeled "Steam generator tube rupture: Margin to Overfill"

The system status and radiological inventory of this accident are listed in USAR Table 15.6-4, "Parameters Used in Evaluating the Radiological Consequences of a Steam Generator Tube Rupture." The offsite radiological consequences are summarized in USAR Table 15.6-5, "Radiological Consequences of a Steam Generator Tube Rupture." The projected dose at the site boundary was 1,100 mRem.

Document APF 06-002-03, EAL Classification Matrix, identifies the above as a **General Emergency** based on **FG1.1** or **RG1.2** with Dose assessment using actual meteorology indicates doses > 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond the SITE BOUNDARY.

USAR § 15.6.3.2.2, "Analysis of Effects and Consequences," describes the sequence:

Reactor trip occurs automatically as a result of low pressurizer pressure or over temperature Delta T. Loss of offsite power occurs at reactor trip.

For this assessment procedure EMG E-0, "Reactor Trip or Safety Injection," was the entry point for operator actions. USAR Figures 15.6-3A, "SGTR Margin to Overfill Pressurizer Pressure,"

through 15.6-3J, "SGTR Margin to Overfill Ruptured Steam Generator Water Volume Pressure," help inform the sequence of events that follow.

EMG E-0:

The reactor has tripped and one steam generator has both a tube rupture and a fault. EMG E-0, follows the "normal path" through step #6 (the emergency diesel generators started without incident).

Normally, fold-out page Step #4 would isolate feed flow by this point. **(RO#1)**

Step #6 jumps to Attachment F, "Automatic Signal Verification," to ensure feedwater isolation has occurred. This step, as noted in the basis document, addresses the problem that: **(RO#1)**

> *The main feedwater system is isolated on a feedwater isolation signal to prevent uncontrolled filling of any S/G and the associated excessive RCS cooldown, which could aggravate the transient, especially if it were a steamline break. The S/G blowdown and sample valves close on an SI signal but are included in the verification of feedwater isolation in order that they may be checked at this time.*

In this case, the scenario specifically involves uncontrolled filling of a faulted S/G.

For any **local** operator actions called out in Attachment F, see specifically:

- F1, "Verifying Feedwater Isolation", the RNO path and actions in Attachment A, "Valves Closed by S/G Blowdown and Sample Isolation Signal." **(NSO#6)**
- F2, "Verifying Containment Isolation", the RNO path and actions in Attachment B, "Valves Closed by Containment Isolation Signal Phase A." **(NSO#5)**
- F8, "Verify Containment Purge Isolation", the RNO path and actions in Attachment C, "Valves Closed by Containment Purge Isolation Signal." **(NSO#5)**
- F10, "Verify Main Steamline Isolation Not Required", the RNO path and actions in Attachment D, "Valves Closed by Steamline Isolation Signal." **(NSO#6)**
- F11, "Verify Containment Spray Not Required", the RNO path and actions in Attachment E, "Valves Closed by Containment Isolation Signal Phase B." **(NSO#5)**

Step #8 has a check for total AFW flow > 270,000 lbm/hr. The RNO path for this event involves manual operations and jumps to procedures needed if this event was more serious than the scenario assessed here. **(RO#2)**

Steps #9 and #10 checks RCS cold leg temperatures and establish steam generator (SG) pressure control. There are no specific instructions requiring local operator actions. **(RO#2)**

For steps #11 - #13, the normal path is followed. USAR Figure 15.1-22, "Pressurizer Pressure and Pressurizer Water Volume vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available," shows a rapid drop in volume for the first 20 seconds and a rapid drop in pressure for the first 60 seconds, stabilizing at an RCS pressure of approximately 1000 psia and a liquid volume less than 50 ft^3. As noted above, a pressurizer valve failure is outside the scope of this event. **(RO#2)**

Step #14 follows the normal path. The reactor coolant pumps tripped when the reactor tripped.

(RO#2)

Step #15 directs an operator to monitor critical safety functions using procedure EMG F-0, "Critical Safety Function Status Trees," while continuing with this procedure. **(SM/CRS/WCSRO)**

Step #16 checks to see if "S/Gs Are Not Faulted." The RNO path (which reflects this narrative) sends the operator to procedure EMG E-2, "Faulted Steam Generator Isolation," step #1. **(RO#2)**

EMG E-2:

Step #1 has the operator check to see if the steam lines on all S/G's are isolated. This involves ensuring the main steam line valves, bypass valves and low point drain valves are closed. The RNO path has manual operations, but no local operations were identified. **(RO#2)**

Step #2 has the operator check to see if limitations for fault in Area 5 are required (which will depend on where the break is located). The procedure adds a warning to local operators in the affected area. **(RO#2/NSO#6)**

Step #3 checks to see if any S/G's are <u>not</u> faulted. Based on the scenario for this event, S/Gs that are not connected to the broken main steam line are not faulted. **(RO#2)**

Step #4 identifies S/G's that are faulted. The normal path has "any S/G pressures decreasing in an uncontrolled manner" OR "any S/G completely depressurized", which is consistent with USAR Figures 15.1-25 and 15.1-26. **(RO#2)**

Step #5 isolates the faulted S/G's. The normal path involves closing the AFW flow controls to the faulted S/Gs. The RNO path has an operator locally isolate the affected lines. The Turbine Driven AFW pump always has the steam supply line locally closed by the operator. The S/G atmospheric relief valves (ARVs) on the faulted S/Gs are checked closed, and the RNO path has an operator locally isolate the affected S/G ARVs. **(RO#2/NSO#5/NSO#6)**

Step #6 addresses isolating feedwater lines. The RNO path for this section involves manual closure of valves. If manual closure of valves also fails, then a subsequent RNO path has a dispatch operator isolate valves locally. The valves in question are the main feedwater reg valves, the main feedwater reg bypass valves and the main feedwater chemical injection valves. **(RO#2/NSO#5)**

Step #7 covers isolation of blowdown and sampling lines. There is an RNO path to locally isolate the affected blowdown and/or sampling line(s) for the affected S/G's. **(RO#2)**

Step #8 discusses situations where the pressurizer PORV opens due to high pressure. For the event described, the RCS pressure drops with the cooldown and the pressurizer empties 18 seconds into the event (see USAR Table 15.1-1, sheet #2, as described above). The event follows the normal path. **(RO#1)**

Step #9 discusses continued uncontrolled cooldown. The core inlet temperature for the intact loops and the core average temperature start to stabilize after the first 40 seconds of the event. See USAR Figure 15.1-23, "Reactor Vessel Inlet Temperature and Core Average Temperature vs. Time for SLB Transient at Hot Zero Power without Offsite Power Available." The normal path is followed, based on the accident description. **(RO#2)**

Step #10 has specific extreme caution statements regarding performing local surveys if the steam lines in Area 5 of the aux building are not intact, if there is a need to establish a sampling capability to determine secondary radiation levels. Health physics is directed to locally survey the steam lines in this area. Chemistry is directed to sample all S/G's for activity. In this case, per the scenario, no steam generator tubes are ruptured. **(CRS/RO#2/RP#1)**

The basis document comments:

> *Since it may be difficult to sample a depressurized steam generator for activity, the operator should suspect a rupture if the steam generator does not dry out following isolation of feed to it. A faulted, ruptured steam generator will stay at some low pressure and continue to cool that loop and the RCS. In addition, the operator should suspect a rupture if there is no indication of a RCS leak to containment. If the operator suspects that a faulted steam generator is not drying out and cannot confirm that it is ruptured by sampling because a sample cannot be drawn, a couple of options exist. A check for radiation in the area of the break (if it is outside the containment) to confirm that a rupture exists may be performed or the conclusion that the faulted generator is ruptured*

if it is not practical to check for radiation based on response of the faulted steam generator or the response of the RCS may be made.

Step #11, on the RNO path, involves using an operator to locally open the ESW A or B to air compressor, to insure instrument air compressors are available to supply air to instruments and to restore instrument air to the containment. **(RO#2/NSO#5)**

Step #12 checks for intact S/G tubes. Based on the scenario, the S/G tubes are intact and the operator follows the normal path. **(RO#2/RP#1)**

EMG E-3:

Step #1's (Loss of offsite power, RCPs are already tripped) RNO path assumes a small-break LOCA with a delayed reactor trip (see the basis document for more details). This scenario assumes the reactor has already tripped, as described earlier (see USAR Figures 15.0-24 and 15.6-3A). **(RO#1)**

Step #2 involves identifying ruptured S/Gs. The steam line surveys and/or S/G chemistry samples conducted on either the normal or RNO paths are assumed to have already been started, based on EMG E-2, step #10, above. **(RO#2)**

Step #3 involves isolating the flow from ruptured S/Gs. The S/G ARV is assumed not closable, since liquids are venting from the valve. The RNO path for **locally** isolating the ARV is followed. The remainder of the sub-steps on the normal path have **local** actions to close the steam supply to the turbine driven AFW pump and **local** isolation of the main steam line low point drain valve from ruptured S/Gs. However, these steps are assumed to have already been started during EMG E-2, steps #5 through #7, above. **(RO#2/NSO#5)**

Step #4 has an RNO path for **local** isolation of affected blowdown or sample lines. Again, these steps are assumed to have already been started during EMG E-2, steps #5 through #7, above. **(RO#2/ NSO#5)**

Step #5 has a potential RNO path for **local** isolation of the main steam header. **(RO#2)** (**NSO#6)**

Step #6 has no local actions. **(RO#2)**

Step #7 has an RNO path to **locally** isolate the AFW flow control valves for the Motor-Driven and Turbine-Driven AFW pumps from a ruptured S/G. **(RO#2/NSO#6)**

Step #8 has no local actions. **(RO#2)**

Step #9 checks the ruptured S/G's pressure >380 psig since the scenario assumes the TDAFW pump is not stopped in a timely manner and is over-filling the ruptured S/G and should follow normal path. **(RO#2)**

Step #10 checks if low steamline pressure SI should be stopped. It is assumed to follow the normal path, given the pressure diagram in USAR Figure 15.6-3D, "SGTR Margin to Overfill, Steam Generator Pressure". **(RO#1)**

Step #11 follows the RNO path, since the loss of offsite power means no RCPs are Running. The RNO prevents performance of EMG F-0 based on T-cold indication in the ruptured or inactive loop until completion of Step #53 **(SM/CRS)**.

Step #12 (Determine Target Plant Conditions from Table Below). USAR Figure 15.6-3D shows the lowest S/G Pressure for the ruptured S/G drops to about 750 psia at about 1700 seconds into the event. **(RO#2)**

Step #13 determines the method used to cooldown at maximum rate. **(RO#2)**

Step #14 follows the RNO path, since the loss of offsite power means the steam dumps are not available. This path bypasses step #15 and goes to step #16. (The basis document also provides a clarifying historical reference to the Ginna 1982 event). **(RO#2)**

Step #16 follows the normal path, since this scenario assumes only one S/G is ruptured and faulted. The other S/Gs are intact. This event does not have ARVs "failing open" for any S/G except for the ruptured/faulted one. This scenario also assumes the remaining S/G ARVs are still controllable by the operators. **(RO#2)**

Steps #17 and #18 follow the normal path. Any additional pressurizer problems would be outside the scope of this event. **(RO#1)**

Steps #19 and #20 cover scenarios where offsite power is lost after SI has reset. This scenario, in contrast, assumes that offsite power was lost at the beginning of the event. **(RO#1)**

Step #21 on the RNO path involves using an operator to **locally** manipulate the ESW A or B to air compressor valves. Circuit breakers are reset to ensure instrument air compressors are available to supply air to instruments and to restore instrument air to the containment. An operator may be dispatched to **locally** reset alarms and restart air compressors as needed. **(RO#1/NSO#5/NSO#6)**

Step #22 on the RNO path has an operator **locally** open the instrumentation air supply containment isolation valve. **(RO#1/NSO#5)**

Steps #23 checks if RHR pumps should be stopped and has no local operations. **(RO#1)**

Step #24 has no local operations and provides a "hold point" to complete the cool-down of the RCS before continuing with RCS decompression. Control is maintained using the intact S/G's ARVs and/or the turbine-driven AFW pump. **(RO#2)**

Step #25 checks the pressure behavior of the ruptured S/G. **(RO#2)** USAR Figure 15.6-3D shows the ruptured S/G pressure trending with the intact S/G pressures almost immediately after reactor trip, and stabilizing above within the first 1000 seconds. With addition complications the ruptured steam generator could depressurize less than 250 psig above the intact steam generators. This series of events sends the operator down the RNO path and jumps to procedure EMG C-31, "SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired". See the basis document and USAR § 15.6.3.1.1, "Identification of Cause and Accident Description", item (g), for more details.

EMG C-31:

Steps #1 through #4 are assumed to have been conducted during the earlier procedures and follow the normal path.

Step #4 is a check on availability of offsite power to the NB01 and NB02 busses. The scenario assumes loss of offsite power at the beginning of the event, so the RNO path is followed. For this scenario, it's assumed the EDGs have started and loaded up properly. (If there was a loss of both onsite and offsite power, that event would be covered in the *Station Blackout (SBO)* narrative, which is beyond the scope of this scenario). **(RO#2)**

Step #5 checks whether the diesel generators should be stopped. This scenario assumes that there was a loss of offsite power when the event started. Operators will try to restore offsite power to NB01 and NB02, but until that is successful, the emergency diesel generators will be kept running and loaded to their respective busses. **(RO#2)**

Step #6 de-energizes the PZR heaters. **(RO#1)**

Step #7 has an operator perform a **local** reset and closure of the boric acid transfer pump and emergency borate valve breakers. This ensures boration capability is available for the RCS cool-down. **(RO#2/NSO#5/NSO#6)**

Steps #8 and #9 reenergize equipment and close breakers. These steps have no local operations. **(RO#2)**

Step #10 involves checking availability of offsite power. The RNO path is to "try to restore offsite power using applicable SYS procedure(s)". One of the additional RNO sub-steps involves energizing the TSC diesel using procedure STN KAT-001, while this procedure continues. **(RO#2/ NSO#7)**

STN KAT-001:

Operator **locally** performs the prerequisite checks listed in § 7, "Prerequisites." **(NSO#7)**

Operator **locally** performs § 8.1, "Testing Installed TSC Diesel Generator" **OR** § 8.2, "Testing Temporary TSC Diesel Generator." **(NSO#7)**

Note that if the TSC Diesel Generator runs for more than an hour, refer to Attachment B, "TSC Diesel Generator Reading," or if applicable, Attachment C, "TSC Temporary Diesel Generator Readings," for hourly checks on the diesel generator in question. **(NSO#7)**

EMG C-31 (continued):

Step #11 involves checking the status of the containment sprays, which are not expected to be operating (or need to), given the details of the scenario. The RNO path moves to step #12. **(RO#1)**

Step #12 checks for the level of a ruptured S/G. Given the scenario and USAR Figure 15.6-3J, "SGTR Margin to Overfill Ruptured Steam Generator Water Volume," the secondary side has a forced overfill. The RNO path step #12(a) goes directly to the normal path step #12(c), to stop feeding the ruptured and faulted S/G. Cool-down will continue with the intact S/Gs. **(RO#2)**

As noted in USAR § 15.6.3.1.2:

> *Once the ruptured steam generator level reaches 15% NRS, the AFW flow from the turbine driven AFW pump to the ruptured steam generator is terminated. Thirty seconds after the AFW flow from the turbine driven AFW pump is isolated to the ruptured steam generator, the AFW flow from the motor-driven AFW pump to the ruptured steam generator is terminated.*

Step #13 follows the RNO path, as the RCS is expected to depressurize. Go to step #14. **(RO#1)**

Step #14 aligns CCW sampling systems. **(RO#2)**

Step #15 places the hydrogen analyzers in service. This step has no local actions. **(RO#2)**

Step #16 checks the radiation levels in the Fuel and Auxiliary buildings. **Radiation protection** is directed to **survey fuel and auxiliary buildings** with priority being pipe penetration areas and piping tunnels. Some of these surveys were expected to have been previously addressed in EMG E-2, step #10. **(RO#2/RP#1)**

Step #17 has **chemistry** check the **boron and activity levels** at the following locations: RCS, PZR Liquid Space and Steam Generators. The S/G activity checks were expected to have been previously addressed in EMG E-2, step #10. **(CRS/RP#1/RO#1)**

Step #18 is a check on plant status and has no local actions. **(CRS)**

Step #19 checks pressure on all S/Gs to see if any still have an uncontrolled pressure decrease. For this scenario, it's assumed that the actions started in EMG E-2 have successfully isolated the ruptured and faulted S/G. The operator stays on the normal path. **(RO#2)**

Step #20 checks on the water levels and feed flows for the intact S/Gs. The intact S/Gs are under control. The only S/G overfill occurred with the ruptured and faulted S/G, which has been isolated. The operator stays on the normal path. **(RO#2)**

Step #21 checks if condenser air removal should be returned to normal. The scenario assumes a loss of offsite power at the beginning of the event, so the condensers were never available. The operator follows the RNO path and goes to step #22. **(RO#2)**

Step #22 checks if low steam-line pressure SI should be blocked. **(RO#1)**

EMG C-31 (continued):

Step #23 initiates RCS cooldown to cold shutdown. Given the loss of offsite power, cooldown will be through the atmospheric relief valves rather than by the condenser. See USAR § 15.6.3.1.2, "Analysis of Effects and Consequences," item (g), for more details. At step 22(d), the RNO path is followed. **(RO#2)**

Steps #24 and #25 check the appropriateness and adequateness of subcooled recovery. No additional uncontrolled pathways for losing RCS inventory are identified in this scenario. The normal path is followed. **(RO#1)**

Step #26 checks whether safety injection pumps are running. Per USAR Table 15.6-1, they have been running since 219 seconds into the event. The normal path is followed. **(RO#2)**

Step #27 initiates RCS depressurization to refill the pressurizer. Per USAR Figure 15.6-3F, "SGTR Margin to Overfill Pressurizer Level," the water level is at 40% when RCS cooldown is initiated and is at approximately 2% at the end of RCS cooldown. The operator follows the RNO path and goes to step #28.
(RO#1)

Step #28 checks availability of the RCPs. There is no offsite power, so the RCPs are not available. The operator follows the RNO path and goes to step #31. **(RO#2)**

Step #31 checks to see if one CCP should be stopped. Per USAR Figure 15.6-3F and USAR Table 15.6-1, the steps to terminate safety injection (except for one CCP left running) occur within 3334 seconds of the start of the event. Per USAR Figure 15.6-3C, "SGTR Margin to Overfill Intact Loop RCS Temperature," the hot leg temperature is greater than 460 ºF and the cold leg is approximately 400ºF at this point. **(RO#1)**

Step #32 checks to see if SI pumps should be stopped. Pressurizer level is greater than required, per USAR Figure 15.6-3F. The normal path is followed. **(RO#2)**

Once the pressurizer level has recovered to greater than required, one SI pump is stopped. Again, this will happen 3334 seconds into the event. The operator loops to the beginning of this step and continues checking RCS sub-cooling vs. SI pump status until all SI pumps have been stopped. Then the RNO path is followed and the operator goes to step #32.

Step #33 checks to see if normal charging should be established. Per Figure 15.6-3F, all but one of the CCP pumps are stopped. The RCPs are not running, given the loss of offsite power. The pressurizer level is recovering. **(RO#1)**

EMG C-32, may be entered if the Control room staff feels that they do not have enough RWST/SG inventory available to do the controlled cooldown during recovery.

EMG C-32:

Step #1 evaluates the RWST level to determine if level is adequate for cooldown rates required. **(RO#1)**

Step #2 checks the ruptured S/G level to ensure adequate water levels to secure feeding the generator. **(RO#2)**

Step #3 checks if RHR pumps should be stopped. **(RO#2)**

Step #4 checks if S/G(s) are not faulted to allow any faulted generators to be isolated prior to recovery.. **(RO#2)**

Step #5 checks intact S/G levels to ensure adequate heat sing for cooldown. **(RO#2)**

Step #6 checks if the low steamline pressure SI should be blocked. **(RO#1)**

Step #7 initiates RCS cooldown to cold shutdown at a rate of 100F/hr using RHR/Dumping steam from Intact ARVs. **(RO#2)**

Step #8 checks RCS subcooling greater than 30 degrees F. **(RO#2)**

Step #9 checks if any of the following conditions are satisfied – any SI pumps running or BIT not isolated or RHR pumps running in SI mode. **(RO#2)**

Step #10 depressurizes RSC to refill the PZR. **(RO#1)**

Step #11 checks if RCP(s) should be started. If RCP(s) are all stopped, then skip to step #14. **(RO#2)**

Step #14 checks if one CCP should be stopped if RCS subcooling temperature is greater than required subcooling. **(RO#1)**

Step #15 checks if SI pumps should be stopped if RCS subcooling temperature is greater than required subcooling. **(RO#2)**

Step #16 checks if normal charging should be established. **(RO#1)**

Step #17 and step #18 verify CCW to service loop and to containment. **(RO#2)**

Step #19 verifies RCP thermal barrier cooling. **(RO#2)**

Step #20 aligns CCPs for normal charging. **(RO#1)**

Step #21 aligns the charging system. **(RO#1)**

Step #22 isolates the BIT. **(RO#2)**

Termination path (expected actions are beyond the first 90 minutes of the event):

The CCP flow is throttled back to 100 gpm per USAR Table 15.6-1, 3933 seconds into the event. The closing actions to this event, as described in USAR § 15.6.3.1.2, accomplish the following:

> *Following termination of the RCS cooldown, the RCS is depressurized by opening a pressurizer PORV to assure an adequate coolant inventory prior to terminating SI flow. Primary depressurization is initiated at 5 minutes following the termination of the RCS cooldown and continues until the RCS pressure is less than the ruptured steam generator pressure.*
>
> *Following the depressurization, termination of SI is delayed to ensure enough liquid enters the pressurizer to maintain inventory and preserve subcooling margin. It is assumed that 4 minutes following the termination of the RCS depressurization that the safety injection flow is terminated.*

Analysis 7
Steam Generator Tube Failure
On-Shift Staffing Analysis Report
Revision 2

This On-Shift Analysis (OSA) is applicable to Analysis #7 identified in Appendix A **(Steam Generator Tube Failure).**

Analysis #7

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L9 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L2	No	No
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L4	No	No

Analysis #7

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L5	No	No
6	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L6	No	No
7	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L7	No	No
8	Nuclear Station Operator #7 (NSO#7)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L8	No	No

Analysis #7

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
9	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L5 T4/L6	No	No
10	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L1 T4/L3	No	No
11	Radiation Protection Technician #2 (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L4	No	No
12	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown Analysis #7

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #4	Nuclear Station Operator #4 (FBL)	Operations Training
7	Auxiliary Operator #5	Nuclear Station Operator #5 (Aux)	Operations Training
8	Auxiliary Operator #6	Nuclear Station Operator #6 (TB)	Operations Training
9	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
9	Mechanic	N/A	N/A
10	Electrician	N/A	N/A
11	I&C Technician	N/A	N/A
12	Other	N/A	N/A

TABLE 3 – Firefighting Analysis #7

Line	Performed By	Task Analysis Controlling Method
1	N/A – there is no fire associated with this event.	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

TABLE 4 – Radiation Protection & Chemistry

Analysis #7

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position: RP Tech #1 Main Steam Line Survey							X	X	X	X	X							
2	On-Site Survey On-Shift Position:	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure.																	
3	Personnel Monitoring On-Shift Position: RP Tech #1	X	X	X	X	X	X						X	X	X	X	X	X	X
4	Job Coverage On-Shift Position: RP Tech #2.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling is required until the Technical Support Center is staffed per AP 15C-003.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes.
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation Analysis __#7__

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this event	N/A
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and EP Training/Drill Program

Event #8 Loss of Coolant Accidents

Narrative

This is one of the Design-Basis Condition IV Limiting Fault events as listed in the USAR, § 15.0.1.4, "Condition IV - Limiting Faults." USAR § 15.6.5.1, "Identification of Causes and Accident Description," states:

> *A loss-of-coolant accident (LOCA) is the result of a pipe rupture of the reactor coolant system (RCS) pressure boundary. A major break (large break) is defined as a rupture with a total cross-sectional area equal to or greater than 1.0 ft^2.*

USAR § 15.6.5.2, "Sequence of Events and Systems Operations," continues:

> *Before the break occurs, the unit is in an equilibrium condition; i.e., the heat generated in the core is being removed via the secondary system. During blowdown, heat from fission product decay, hot internals, and the vessel continues to transfer to the reactor coolant. At the beginning of the blowdown phase, the entire RCS contains subcooled liquid which transfers heat from the core by forced convection with some fully developed nucleate boiling. After the break develops, the time to departure from nucleate boiling is calculated… Thereafter, the core heat transfer is unstable, with both nucleate boiling and film boiling occurring. As the core becomes uncovered, both transition boiling and forced convection are considered as the dominant core heat transfer mechanisms. Heat transfer due to radiation is also considered.*
>
> *When the RCS depressurizes to 600 psia, the accumulators begin to inject borated water into the reactor coolant loops. The conservative assumption is made that all of the accumulator water injected during the bypass period is subtracted from the RCS after the bypass period terminates (called end-of bypass).*
>
> *End-of-bypass (EOB) occurs when the expulsion or entrainment mechanisms responsible for the bypassing are calculated not to be effective…*
>
> *Since loss of offsite power (LOOP) is assumed, the reactor coolant pumps are assumed to trip at the inception of the accident. The effects of pump coastdown are included in the blowdown analysis.*
>
> *The blowdown phase of the transient ends when the RCS pressure (initially assumed at 2300 psia) falls to a value approaching that of the containment atmosphere. Prior to, or at the end of, the blowdown, termination of bypass occurs and refill of the reactor vessel lower plenum begins. Refill is completed when emergency core cooling water has filled the lower plenum of the reactor vessel to the bottom of the active fuel region (BOC time).*
>
> *The reflood phase of the transient is defined as the time period lasting from BOC recovery until the reactor vessel has been filled with water to the extent that the core temperature rise has been terminated. From the latter stage of blowdown and then the beginning of reflood, the accumulator tanks rapidly discharge borated cooling water into the RCS, thus contributing to the filling of the reactor vessel downcomer. The downcomer head provides the driving force required for the reflooding of the reactor core.*

The RHR (low head), safety injection, and high head centrifugal charging pumps aid in the filling of the downcomer and subsequently supply water to maintain a full downcomer and complete the reflooding process. Continued operation of the ECCS pumps supplies water during long-term cooling.

Core temperatures have been reduced to long-term steady state levels associated with dissipation of residual heat generation. After the water level of the refueling water storage tank (RWST) reaches a minimum allowable value, coolant for long-term cooling of the core is obtained by switching to the cold leg recirculation phase of operation. Spilled borated water is drawn from the engineered safety features (ESF) containment sump by the RHR (low head) pumps and returned to the RCS cold legs. The containment spray pumps are manually aligned to the containment sump and continue to operate to further reduce containment pressure and temperature. Approximately 10.0 hours after initiation of the LOCA, the ECCS is realigned to supply water to the RCS hot legs in order to control the boric acid concentration in the reactor vessel.

The reactor parameters that bound the radiological consequences of a LOCA can be found in USAR Tables 15A-1, "Parameters Used in Accident Analysis," and 15.6-6, "Parameters Used in Evaluating the Radiological Consequences of a Loss-of-Coolant-Accident." As outlined in USAR § 15.6.5.4, "Radiological Consequences," the radiological source term includes the assumptions:

a. *The reactor core equilibrium noble gas and iodine inventories are based on long-term operation at the ultimate core power level of 3,565 MWt plus 2% uncertainty.*
b. *The nuclide groups and their release fractions are presented in Table 15.6-6.*
c. *Of the iodine fission product inventory released to the containment, 4.85 percent is in the form of elemental iodine, 95 percent is in the form of particulate iodine, and 0.15 percent is in the form of organic iodine.*
d. *Credit for removal of iodine and particulates by the containment spray system is taken, starting at 2 minutes after event initiation and continuing until a decontamination factor of 200 for the elemental species has been achieved. The credit for particulate species removal is continued for the duration of sprays but is reduced by a factor of 10 after a decontamination factor of 50 is achieved.*

USAR Table 15.6-8, "Radiological Consequences of a Loss-of-Coolant-Accident," lists an exclusion area boundary dose of 5,300 mRem TEDE.

Document APF 06-002-03, EAL Classification Matrix, classifies the large break LOCA as a **General Emergency** on **RG1.2**, "Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE" based on the above projected exclusion area boundary dose projections.

The event as diagrammed in USAR Figure 15.0-25, "Loss of Coolant Accident," is assumed to generate a reactor trip from full power, based on the USAR § 15.6.5.2 statement:

> "*…depressurization of the RCS results in a pressure decrease in the pressurizer. The reactor trip signal subsequently occurs when the pressurizer low pressure trip setpoint is reached.*"

A loss of offsite power (LOOP) is also assumed, per USAR § 15.6.5.2.

A conceptual timeline of the events is shown in USAR Figure 15.6-4, "Sequence of Events for Large Break LOCA Analysis."

EMG E-0:

For this assessment, it was assumed that procedure EMG E-0, "Reactor Trip or Safety Injection," was the entry point for operator actions. The reactor has tripped, and a large (greater than one square foot) break in the reactor coolant system has caused a LOCA. Offsite power was lost at the beginning of the event, but the emergency diesel generators started and loaded onto the busses properly.

EMG E-0, the "normal path," is followed through Step #8. **(RO#1/RO#2)**

Steps #9 and #10 checks RCS cold leg temperatures and establish steam generator (SG) pressure control. In this scenario, the coolant is being ejected through a large-break LOCA. The condenser is unavailable due to the loss of offsite power and the main steam lines have been automatically isolated due to the reactor trip and loss of offsite power. See USAR § 10.3.2.3, "System Operation," [of the Steam System] for more details on the equipment response. For this scenario, the large break LOCA predominates. The operator follows the normal path. **(RO#2)**

Steps #11 through #13 looks for loss of RCS inventory due to problems with the pressurizer (stuck-open PORV, actions of the pressurizer spray values, or open pressurizer safety valves). In this case, the loss of RCS inventory is due to the large-break LOCA. The operator follows the normal path. **(RO#2)**

Step #14 checks whether the RCPs should be stopped. The RCPs are already stopped, since a loss of offsite power occurred at the beginning of the event. The operator follows the RNO path. **(RO#2)**

Step #15 has the operator monitor <u>procedure EMG F-0,</u> "Critical Safety Function Status Trees," while continuing this procedure.
(SM/CRS/WCSRO)

EMG F-0: **(SM/CRS/WCSRO)**

In this case, the LOCA caused a blowdown of reactor coolant into the containment building. This generated a rapid increase in containment pressure, as much of the coolant flashed to steam.

USAR § 6.2.1.2.1, "Design Basis," describes the LOCA as:

"…a double-ended cold leg guillotine break within the reactor cavity. Pipe restraints are employed to limit the break flow area to less than 150 square inches."

USAR Table 6.2.1-2, "Principal Containment Design Parameters," shows the containment pressure for a LOCA peaking at 47.8 psig and the temperature peaking at 307.2ºF. USAR Table 6.2.1-8, "Comparative Results: Summary of Results of Containment Pressure and Temperature Analysis for the Spectrum of Postulated Accidents" shows peak pressure is reached within 130 seconds and peak temperature is reached within 60 seconds of the start of the event, for a variety of double-ended guillotine pipe breaks.

For this analysis, it's assumed the operator observed the rapidly increasing containment pressure and followed the critical safety function status tree F-05, "Containment." Containment pressure is less than 60 psig, but is greater than 27 psig. The containment spray pumps **are** running, as noted in USAR Figure 15.6-4. This status tree follows a yellow path condition. As this is not a red or orange path condition the crew will stay in EMG E-0.

EMG E-0 (continued):

Step #16 checks to see if any S/G is faulted. The S/Gs in this scenario are not faulted. The operator follows the normal path. **(RO#2)**

Step #17 checks to see if the S/G tubes are intact. (At this point, the containment building is pressurizing to greater than 40 psig and a temperature greater than 300ºF). **(RO#2)**

Step #18 checks to see if the RCS is intact in containment. The containment pressure is rising, so the operator follows the RNO path to procedure EMG E-1, "Loss of Reactor or Secondary Coolant," step #1. **(RO#1)**

EMG E-1:

Step #1 checks if the RCPs have been stopped. The scenario has the RCPs tripped when the reactor tripped, with the loss of offsite power. Follow the RNO path and go to step #2. **(RO#2)**

Step #2 checks if the S/Gs are faulted. This is a repeat of procedure EMG E-0, step #16. The operator follows the normal path. **(RO#2)**

Step #3 checks if the S/Gs are intact (e.g., are not ruptured). **(RO#2)**

Step #4 has the operator reset the safety injection (SI), and Step #5 has the operator reset the containment isolation phase A and B. **(RO#1/RO#2)**

Step #6 determines the secondary radiation levels. One sub-step has health physics surveys steam lines in Area 5 of the Auxiliary Building, which was already to have been started in procedure E-0, step #17. **(RO#2/RP#1)**

Step #6, sub-step (e), opens all S/G sample isolation valves. At that point, **chemistry** is directed to **sample all S/Gs** for activity. **(CRS/RO#2)**

Step #7 is a check on the secondary radiation levels. No local actions were identified. **(RO#2)**

Step #8 checks pressurizer PORV valves, which are assumed in this scenario to be acting normally. The loss of RCS pressure is due to a double-ended guillotine break in the cold leg, not due to a pressurizer valve lifting. The pressurizer valves remained closed and the RCS pressure has rapidly dropped below 2185 psig. Accumulator injection concludes at 34 seconds into the event, as noted in USAR Table 15.6-10, "Time Sequence of Events for Loss-Of-Coolant Accidents." **(RO#1)**

Step #9 verifies instrument air alignment. This scenario assumes a loss of offsite power at the beginning of the LOCA. The RNO path involves using an operator to **locally** open the ESW A or B to air compressor valves, in order to insure instrument air compressors are available to supply air to instruments and to restore instrument air to the containment.

An operator may also be dispatched to **locally** reset alarms, restart air compressors and open instrument air supply containment isolation valves as needed. **(RO#2/NSO#5/NSO#6)**

Step #10 verifies instrument air to containment**. (RO#2)**

Step #11 checks to see if the ECCS flow should be reduced. In this scenario, the RCS has blown down to the bottom of the core and is re-filling. Much of the initial RCS inventory has flashed to steam, heating and pressurizing the containment building. The RCS pressure is rapidly decreasing. The operator goes to step #12. **(RO#1)**

Step #12 checks to see if the containment sprays should be stopped. The spray pumps are assumed to be running, and the containment pressure is between 3 psig and 60 psig. (Per USAR Figure 6.2.1-6 has the containment pressure at 27 psig and decreasing at 1000 seconds. This step is assumed to follow the normal path. If 2 or more of the 4 available containment fan coolers are running in emergency mode, only one running spray pump will be required. As noted in USAR § 6.2.1.4.3.2, "Input Parameters and Assumptions," the containment fan coolers are operable using power from the emergency diesel generators. **(RO#2)**

Step #13 checks if RHR pumps should be stopped. The RHR pumps should continue running, as the RCS has blown down to the bottom of the core and is re-filling. The operator follows the normal path. **(RO#2)**

Step #14 checks the RCS and S/G Pressures. The RCS pressure is stable or decreasing due to the large double-ended guillotine break in the cold leg. The S/G pressures are not decreasing in an uncontrolled manner. The operator follows the normal path. **(RO#1/RO#2)**

Step #15 checks whether the diesel generators should be stopped. This scenario assumes that there was a loss of offsite power when the event started. Operators will try to restore offsite power to NB01 and NB02, but until that is successful, the emergency diesel generators will be kept running and loaded to their respective busses. **(RO#2)**

Step #16 has an operator **locally** reset and close the boric acid transfer pump breakers and the emergency borate valve breaker. **(RO#1/NSO#5/NSO#6)**

Step #17 has the operator close the non-class 1E battery charger breakers. **(RO#2)**

Step #18 involves checking for the availability of offsite power. The RNO path is to "try to restore offsite power using applicable SYS procedure(s)." One of the additional RNO sub-steps involves energizing the TSC diesel using procedure STN KAT-001, while this procedure continues. **(RO#2/NSO#7)**

STN KAT-001: ***(NSO#7)***

Operator **locally** performs the prerequisite checks listed in § 7, "Prerequisites."

Operator **locally** performs § 8.1.1, "Testing Installed TSC Diesel Generator" **OR** § 8.2.1, "Testing Temporary TSC Diesel Generator."

Operator **locally** performs § 8.1.2, "Placing TSC Diesel Generator In-service" **OR** § 8.2.2, "Placing Temporary TSC Diesel Generator In-service."

Note that if the TSC Diesel Generator runs for more than an hour, refer to Attachment B, "TSC Diesel Generator Reading," or if applicable, Attachment C, "TSC Temporary Diesel Generator Readings," for hourly checks on the diesel generator in question.

EMG E-1 (continued):

Step #19 places the hydrogen analyzers in service. No local actions were identified. **(RO#2)**

Step #20 verifies cold leg recirculation capability. This scenario assumes no additional complications for conducting this step, so the normal path is followed. **(RO#1)**

Step #21 checks to see if the fuel/auxiliary building radiation levels are normal. **Radiation protection** is directed to **survey** the **fuel** and **auxiliary buildings** with priority being pipe penetration areas and piping tunnels. Based on the scenario, a loss of RCS inventory outside of containment is not assumed. The normal path is followed. **(RO#2/RP#1)**

Step #22 requests **chemistry** obtain **boron** and **activity samples** for the RCS and pressurizer liquid space. **(CRS/RO#2)**

Step #23 initiates evaluation of plant status. **(RO#2/CRS/NSO#5)** Based on the scenario, this step is assumed to follow the normal path. As the basis document notes:

> *An evaluation of plant equipment available following a LOCA is necessary in determining long-term recovery actions. Hence, this evaluation is initiated at this time and any additional equipment that would assist in the plant recovery is started.*

Perform step #23.c RNO for SFP cooling.

Step #24 checks to see if the RCS cooldown and depressurization is complete. Based on the blowdown and refill events, the RCS pressure is less than 325 psig and the operator follows the RNO path to step #25. **(RO#1)**

Step #25 checks to see if the RWST level is less than 36%. If not, the operator loops back to step #20. Once the RWST level has dropped to less than 36%, the operator goes to procedure EMG ES-12, "Transfer to Cold Leg Recirculation," step #1. It should be noted that USAR Table 6.2.1-7, "Chronology of Events, DEPSG Break w/Max SI," which is one of the potential large-break LOCA scenarios, shows ECCS recirculation could be started as quickly as 849 seconds into the event. (**RO#1/CRS)**

EMG ES-12:

One of the notes ahead of step #1 cautions that switching to recirculation may cause **high radiation** in the **auxiliary building. (NSO#5/RP#1)**

Step #1 resets all SI signals. **(RO#1/CRS)**

Step #2 verifies CCW to the RHR heat exchangers. Based on the scenario description, this step is assumed to proceed normally. The RNO path (not followed) has cautionary remarks about radiation levels if valves needed to be locally opened. **(RO#1/CRS) (NSO#5/RP#1)**

Step #3 ensures both CCW from spent fuel pool heat exchangers are closed. Again, based on the scenario description, this step is assumed to proceed normally. The RNO path (not followed) has cautionary remarks about radiation levels if valves needed to be locally closed. **(RO#1/CRS) (NSO#5/RP#1)**

Steps #4 and #5 verify the "red train" and "yellow train" RWST switchovers have occurred (e.g., suction is now being pulled from the containment sump rather than the RWST). The operator follows the normal path for both steps. The RNO paths have manual operations, but no local operations were identified. **(RO#1/CRS) (NSO#5/RP#1)**

Step #6 checks to see that the RHR pumps are both running. For this scenario, the step is assumed to proceed normally. **(RO#1/CRS)**

Step #7 involves closing both RHR train hot leg recirculation valves. The operator follows the normal path. The RNO path (not followed) has cautionary remarks about radiation levels if valves need to be locally closed. **(RO#1/CRS) (NSO#5/RP#1)**

Step #8 isolates SI pump mini-flow to the RWST (to prevent release of containment sump water to the RWST). This step is assumed to follow the normal path. **(RO#1/CRS) (NSO#5/RP#1)**

Step #9 aligns the CCP and SI pump suctions to the RHR pump discharge and is assumed to follow the normal path. The RNO path (not followed) has cautionary remarks about radiation levels if valves need to be locally opened. **(RO#1/CRS) (NSO#5/RP#1)**

Step #10 isolates the RWST from charging and SI pumps, and is assumed to follow the normal path. The RNO path (not followed) has cautionary remarks about radiation levels if valves need to be locally closed. **(RO#1/CRS) (NSO#5/RP#1)**

At this point, Functional Restoration (FR) procedures may now be implemented as required by EMG F-0, Critical Safety Function Status Trees (CSFST). **(RO#1/CRS – RO only for duration of ES-12)**

Step #11 checks to see if phase A, phase B and containment spray actuation can be reset. Given this scenario, it's assumed that the containment spray pumps are running. **(RO#1/CRS)**

Step #12 checks to see if containment spray system should be aligned for recirculation. Once the RWST level reaches 12%, actions in step #13 align the containment spray system for recirculation. Both steps follow the normal path. **(RO#1/CRS)**

Step #14 checks to see if the spray additive tank should be isolated. **(RO#1/CRS)** The normal path is followed. The function of the spray additive tank, per USAR § 6.5.2.2.1, "General Description," is:

> *The containment spray additive portion of the CSS provides for eduction of 30 weight percent (nominal) sodium hydroxide into the spray injection water. This yields a spray mixture with a pH of from 9.0 to 11.0 during the initial period of operation, when radioiodine is being removed from the containment atmosphere.*

Step #15 verifies the "red train" and "yellow train" flow paths from the sump to the RCS. This step's normal path is followed. **(RO#1/CRS)**

Step #16 verifies core cooling. However, the RCPs are NOT running (loss of offsite power), so the required RVLIS level would need to be in the natural circulation range. USAR § 18.2.13.2, "The Operating Agent Response" notes that for large-break LOCAs, the RVLIS system is expected to provide unambiguous indications as early as 30 seconds after the initiation of a double-ended guillotine rupture of a main coolant pipe. The operator follows the normal path. **(RO#1/CRS)**

Step #17 opens the breakers for both CCP suction from RWST valves. **(RO#1/NSO#6)**

Step #18 records the time of fuel pool heat exchanger CW isolation in the control room log. At this point, the time elapsed since fuel pool heat exchanger isolation is less than 3.5 hours, so the RNO path is followed and the operator proceeds to step #19. **(RO#1/CRS)**

Step #19 monitors for ECCS leakage, which is assumed to be normal for the plant conditions. (Additional ECCS leakage is a more complex event and is beyond the scope of the design basis scenario). **(RO#2/CRS)**

Step #20 determines if transfer to hot leg recirculation will be required. This procedure has been entered into from EMG E-1, so this follows step the normal path. It should be noted that hot leg recirculation of the sump water normally starts approximately 10 hours following an

accident. See USAR § 6.3.2.5, “System Reliability” for more details on the potential problem of boron precipitation. **(RO#1/CRS)**

Termination path (expected actions are beyond the 90 minutes of the event).

Analysis 8
Loss of Coolant Accidents
On-Shift Staffing Analysis Report
Revision 2

This On-Shift Analysis (OSA) is applicable to Analysis #8 identified in Appendix A **(Loss of Coolant Accidents).**

Analysis #8

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L9 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L2	No	No
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L4	No	No

Analysis #8

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L5	No	No
6	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L6	No	No
7	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L7	No	No
8	Nuclear Station Operator #7 (NSO#7)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L8	No	No

Analysis #8

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
9	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L5 T4/L6	No	No
10	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L1 T4/L3	No	No
11	Radiation Protection Technician #2 (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L4	No	No
12	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown Analysis #8

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #5	Nuclear Station Operator #5 (Aux)	Operations Training
7	Auxiliary Operator #6	Nuclear Station Operator #6 (TB)	Operations Training
8	Auxiliary Operator #7	Nuclear Station Operator #7 (FBM)	Operations Training
9	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
9	Mechanic	N/A	N/A
10	Electrician	N/A	N/A
11	I&C Technician	N/A	N/A
12	Other	N/A	N/A

TABLE 3 – Firefighting

Analysis #8

Line	Performed By	Task Analysis Controlling Method
1	N/A – there is no fire associated with this event.	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

TABLE 4 – Radiation Protection & Chemistry

Analysis #3

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position: RP Tech #1 Main Steam Line Survey							X	X	X	X	X							
2	On-Site Survey On-Shift Position:	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure.																	
3	Personnel Monitoring On-Shift Position: RP Tech #1	X	X	X	X	X	X						X	X	X	X	X	X	X
4	Job Coverage On-Shift Position: RP Tech #2.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling is required until the Technical Support Center is staffed per AP 15C-003.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation Analysis #8

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this Event	N/A
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and EP Training/Drill Program

Event #9 Design Basis Fuel Handling Accident

Narrative

This is one of the Design-Basis Condition IV Limiting Fault events as listed in the USAR, § 15.0.1.4, "Condition IV - Limiting Faults." USAR § 15.7.4.1, "Identification of Causes and Accident Description" states:

> *The accident is defined as the dropping of a spent fuel assembly onto the fuel storage area pool floor or refueling pool floor, resulting in the rupture of the cladding of all the fuel rods in the assembly despite many administrative controls and physical limitations imposed on fuel handling operations. All refueling operations are conducted in accordance with prescribed procedures.*

A detailed discussion of potential accidents in this category, including analytical methods used and the scenario consequences expected, can be found in USAR § 15.7.4, "Fuel Handling Accidents" and are diagrammed in USAR Figure 15.0-29, "Fuel Handling Accident."

USAR § 15.7.4.2, "Sequence of Events and System Operations" continues:

> *The postulated fuel handling accident is assumed to occur during a core offload at least 76 hours after shutdown in either the reactor containment building, or in the fuel building subsequent to the transfer of a fuel assembly through the fuel storage pool transfer gate and prior to placement in a fuel storage pool storage rack designated location.*

Although both accidents are Condition IV limiting faults, the worst case radiological consequences of the accident are analyzed for both inside containment and inside the spent fuel building, as discussed in USAR Tables 15.7-7, "Parameters Used in Evaluating the Radiological Consequences of a Fuel-Handling Accident" and 15.7-8, "Radiological Consequences of a Fuel Handling Accident."

USAR § 15.7.4.5, "Radiological Consequences," elaborates on the initiating conditions for an accident inside the containment building, involving spent fuel:

> *During fuel-handling operations, the containment is kept in an isolatable condition, with all penetrations to the outside atmosphere either closed or capable of being closed on an alarm signal from one of the redundant radiation monitors, indicating that radioactivity is above the prescribed limits.*
>
> *In addition to the area radiation monitors in the containment, portable monitors capable of sounding audible alarms are to be located in the fuel-handling area. Should a fuel assembly be dropped and release activity above a prescribed level, the radiation monitors would sound an audible alarm, the containment would be isolated, and personnel would be evacuated.*
>
> *During movement of irradiated fuel and core alterations, one door in the emergency air lock must be closed. The other emergency air lock door may be open provided it is capable of being closed. The equipment hatch may be open provided it is capable of being closed, and penetration flow paths providing direct access may be unisolated under administrative controls. Administrative controls are imposed for the closure of a personnel air lock door, closure of the*

equipment hatch, and to isolate open penetration flow paths in the event of a fuel handling accident.

Assumptions and conditions for the accident scenario, per USAR § 15.7.4.5.1.2, "Assumptions and Conditions" include:

The dropped fuel assembly is assumed to be the assembly containing the peak fission product inventory. All the fuel rods contained in the dropped assembly are assumed to be damaged. In addition, the dropped assembly is assumed to damage 20 percent of the rods of an additional assembly.

For the inside the reactor building case, the containment personnel airlock doors and equipment hatch are assumed to be open at the time of the accident. For added conservatism, the gaseous effluent escaping from the refueling water pool in the Reactor Containment Building is assumed to be released immediately to the environment through the open personnel and equipment hatch and the adjacent Auxiliary Building without mixing in the surrounding atmosphere. The activity releases continue until the containment personnel airlock doors and equipment hatch are closed (assumed to be accomplished within two hours). The Auxiliary Building atmosphere is normally exhausted through filter absorbers designed to remove iodine. However, no credit is taken for iodine removal by the atmosphere filtration system filters. It is also assumed that no containment coolers or hydrogen mixing fans are operating and 100% of the activity escaping from the pool to the containment building is released to the environment over a two-hour period following the accident.

Additional remarks on the radiological source term can be found in USAR § 15.7.4.5.2, "Identification of Uncertainties and Conservatisms in Analysis."

USAR Table 15.7-8, "Radiological Consequences of a Fuel Handling Accident," lists an exclusion area boundary dose of 1,200 mRem TEDE.

Document APF 06-002-03, Emergency Classification Matrix, identifies the above as a **General Emergency** based on **RG1.2,** "Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE."

The scenario assumes the reactor is in a refueling outage. The accident occurs while the outage is in Phase III - Fuel Handling. As discussed in USAR § 9.1.4.2.3.1, "Fuel Handling System Operations":

The reactor shall be determined to have been subcritical for at least 76 hours by verification of the date and time of subcriticality prior to movement of irradiated fuel in the reactor vessel. With the reactor subcritical for less than 76 hours, suspend all operations involving movement of irradiated fuel in the reactor vessel. This requirement is consistent with the assumptions of Section 15.7.4.5.1.2.

The event as diagrammed in USAR Figure 15.0-29, "Fuel Handling Accident," is assumed to occur at 76 hours post shutdown. The reactor is in Mode 6, Refueling.

This event would not occur when only the minimum on-shift staff is present. In addition, any new fuel received would occur only during the day shift, when additional staff is available to manage the consequences of any potential events.

Given the above constraints, the staffing requirements were not included in the On-Shift Staffing Analysis, since the “minimum on-shift staff” scenario would not apply.

Event #10 Aircraft Probable Threat

Narrative

This is a scenario as categorized by the NRC, which is outside the scope of the classical design basis accidents as defined by the USAR.

NEI 10-05 rev 0 (6/11), "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," discusses analysis of a 10 CFR 50.54(hh)(1) event in § 2.13:

> *This analysis should include all emergency response actions taken prior to an aircraft impact in accordance with RG 1.214* [an NRC Regulatory Guide with restricted distribution] *for an aircraft threat that is greater than 5 minutes, but less than 30 minutes, from the site, and should consider the dispersal of the site fire brigades away from target areas for firefighting.*

OFN SK-039, "Security Event," classifies aircraft threats in three categories, as defined in § 2.3:

1. *Imminent threat – the site is in the flight path of a track of interest, the estimated time to the site is 5 minutes or less, and the altitude changes align the aircraft with the site OR there's specific, credible intelligence that a small aircraft presents a greater threat than its size would indicate and the estimated time to the site is 5 minutes or less. The other paths to an imminent threat declaration are a locally observed large aircraft threat OR upon order from an NRC imminent security threat authority.*

2. *Probable threat – the site is in the flight path of a track of interest, and either the estimated time to the site is more than 5 minutes but less than 30 minutes, or the site receives specific, credible intelligence that a small aircraft presents a greater threat than its size would indicate and the estimated time to the site is greater than 5 minutes but less than 30 minutes.*

3. *Informational threat – The site is in the flight path of a track of interest and either the estimated time to the site is 30 minutes or more, or the threat is a small aircraft and the site has not received specific, credible intelligence information that the aircraft presents a greater threat than its size would indicated. Another path to an informational threat declaration is a locally observed small aircraft threat.*

As noted in OFN SK-039, Attachment B, for an informational threat, the plane is assumed to be smaller than a 737, DC9, MD80, MD90 or 717, and further, that there is no credible information that the smaller aircraft represents a "disproportionate threat" compared to its size.

NEI 12-05 requirements for the 10 CFR 50.54(hh)(1) analysis classify the aircraft event as a "Probable Threat."

For the purposes of this narrative, the scenario assumes that even if the initial aircraft probable threat resolves itself in under an hour, uncertainties about the threat environment

and the time needed to coordinate across multiple federal agencies will delay final resolution of the event. The 9/11 terrorist attacks help inform the scenario.

This timeline differs from the site's real-world experience with a small aircraft flyover on 6/11/2007, which resolved itself in 30 minutes, but the actual event would have fallen under the lesser "Informational Threat" classification.

Operator actions start with procedure OFN SK-039, "Security Event."

OFN SK-039:

Step #1 checks for a credible threat. The normal path is followed; the aircraft is considered a probable threat, per NEI 10-05, § 2.13. **(SM)**

Step #2 has the NRC contacted to relay information on the threat. **(SM/WCSRO)**

Step #3 is a check on the nature of the threat (airborne or non-airborne-based). The RNO path is followed for the airborne threat. **(SM)**

The operator the goes to Attachment B, "Response to an Airborne Threat."

Attachment B: Response to an Airborne Threat:

Step #B.1 has the Shift Security Lieutenant notified. Continuous communications with the NRC are established. **(SM/WCSRO)**

Per the NOTES, the **Shift Manager** can implement the remaining actions below in the order appropriate for the specific event. The steps from #B.2 through #B.9 should be performed. Implementing the remaining steps may or may not be desirable, depending on the nature of the specific threat.

Step #B.2 has the authenticity of the report validated. Actions in Attachment B continue while the authenticity is validated. **(SM)**

Step #B.3 has possible protective measures evaluated, using Attachment C, "Guidance for Protective Measures." **(SM)**

Attachment C: Guidance for Protective Measures

For this scenario, the plant is assumed to have been at full power at the start of the event. The probable threat aircraft is assumed to be inbound, between 5 minutes and 30 minutes out.

Step #C.1 discusses consideration of protective measures for general site personnel. **(SM)**

Step #C.2 provides a table that lists possible protective measures, factoring in weather conditions and the ETA of the inbound aircraft. **(SM)**

If weather conditions are not severe, and the available warning time is greater than 60 minutes, the guidelines are to evacuate PAB to the E-plan assembly areas. Under adverse weather conditions, step # C.2 has the individuals' shelter in severe weather shelters unless the warning time is greater than 90 minutes. (For an imminent threat, which is beyond the scope of this scenario, the guidelines are to shelter in place).

Step #C.3 has operator personnel relocate to the following locations:

- **CRS** or SRO at the controls and **RO#1** stay in the control room.
- The **WCSRO** and **RO#2** go to the Aux Shutdown Panel.
    - Any crew members outside the protected area go to the Circ Water Screen House. (If persons are already at ESW, they stay at ESW).
- The **SM** or SRO outside the control room, **aux building watch, turbine building watch**, **fire brigade leader and fire brigade members** and all other ops personnel, the shift **RP** and shift **chemist**, go the GOB 1st floor computer training room across from the heartland café by the mail room. **(FBL – NSO#4, FBM – NSO#5, FBM – NSO#6, FBM – NSO#7, FBM – NSO#8, RP#1 and DA)**

The operator **(SM)** then returns to Attachment B.

Attachment B: Response to an Airborne Threat (continued)

Step #B.4 directs that if protective measures are needed, security is to be notified. The security and plant personnel relocation/evacuation process is started, as necessary. Notification is performed using the telephone paging system, or by using the plant's Gai-tronics system if the phones don't work. **(SM)**

Step #B.5 has the **Shift Manager** determine the emergency action level of the event. For the scenario specified, APF 06-002-03, "EAL Classification Matrix," **HA1.1** due to HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes for a Security Hostile Action declared in accordance with WCGS Safeguard Contingency Plan, would classify this event as an **Alert. (SM/WCSRO)**

Steps #B.6 and #B.7 are skipped. The former assumes the plant is in a refueling outage; the latter discusses an "Imminent Airborne Threat." Neither assumption reflects the scenario being analyzed for this narrative.

Step #B.8 has the operator **(CRS/RO#1)** commence a rapid down-power of the reactor, per procedure OFN MA-038, "Rapid Plant Shutdown," concurrently with this procedure.

Step #B.8 continues with directions to Security to implement a site lighting blackout. An operator places the control room in CRVIS lineup. This narrative assumes the operator doesn't have time to follow the normal procedures for a CRVIS lineup, (SYS GK-122 and SYS GK-123), so the CRVIS is manually actuated. **(SM)**

Step #B.9 is skipped. The step is relevant for an "Informational Airborne Threat," which is not the scenario analyzed here.

As noted in the NOTES before step #B.2, performing the remaining steps in this attachment may or may not be desirable, depending on the nature of the specific threat.

Step #B10 has an operator **(CRS/RO#1)** ensure that the reliability of off-site power sources is maintained.

Step #B.11 has an operator **(CRS/RO#1)** ensure that both emergency diesel generators are in standby.

Step #B.12 has an operator **(CRS/RO#1)** ensure that the site has backed out of/stopped in-progress surveillance testing/maintenance. Equipment is to be returned to functional status.

Step #B.13 starts the motor driven fire pump or diesel driven fire pump. **(CRS/RO#1)**

Step #B.14 instructs to place a temporary fire pump in service, if installed. (This scenario assumes the regular fire pumps are in service, so this step is skipped).

Step #B.15 checks for restoration of inoperable ECCS equipment. **(CRS/RO#1)**

Step #B.16 has an operator close the control room missile door. **(CRS/RO#1)**

Step #B.17 checks for securing the containment pump and verifying that containment penetrations are closed. **(CRS/RO#1)**

Step #B.18 checks to ensure that systems are available for reactor shutdown and ATWS. **(CRS/RO#1)**

Step #B.19 checks to maximize makeup water sources and systems, and ensure that all tanks are at their maximum level. **(CRS/RO#1/NSO#5/NSO#6, if available)**

Step #B.20 ensures that decay heat removal systems are available. **(CRS/RO#1)**

Step #B.21 (if plant conditions permit), checks to isolate the spent fuel pool cleanup systems. **(CRS/RO#1/NSO#6, if available)**

Step #B.22 (as plant conditions allow), checks to shutdown ventilation systems, secures all possible site building fans, and minimizes the number of operating turbine building fans. **(CRS/RO#1)**

Step #B.23 returns to the mainline procedure, step #18.

OFN SK-039: (continued)

Step #18 is a check to see that the security event is terminated. This is a “hold point” before continuing with step #19. Step #19 is expected to occur beyond the first 90 minutes of the event.

OFN MA-038: **(CRS/RO#1, everyone else is sheltered or use as available)**

This step occurs during OFN SK-039, step #B.8, which is implemented concurrently. The unloading rate is greater than the 1% per minute of a normal shutdown, but does not exceed 5% per minute. This rate limit is to reduce the risk of turbine vibration during the down-power. See the procedures basis document for more information.

Step #1 has an operator determine the turbine unloading method to be used. Use of AUTO is assumed, in order to reduce the operator workload.

Step #2 has an operator set the turbine for automatic unloading. The normal path is followed.

Step #2.c has an operator borate the reactor cooling system (RCS) and adjusts the control rods, taking advantage of the automated control systems.

Steps #2.d through #6 has an operator energize the pressurizer backup heaters to limit the drop in pressurizer pressure as Tavg is decreased. The pressurizer PORVs are checked to verify pressure; valves and block valves are aligned as necessary. The operator checks the trending of the pressurizer pressure and level. The RNO paths, if they had been followed, would have required manual operations but no local operations were identified.

Step #7 has an operator check the S/G levels. The automatic level control system should be maintaining the proper S/G level. The RNO path, if followed, would have an operator taking manual control of the main feed regulating valves. The scenario assumes the normal path is taken.

Step #8 has an operator notify **radiation protection** that **increased monitoring** of potentially changing radiation levels in the **RCS and other connecting systems** is needed (the driving concern here is over the potential for a crud burst). This step does not require any monitoring while personnel are sheltered.

Step #9 directs sampling to occur after the duration of this event.

Step #10 checks for reactor power less than 65%.

Step #11 has an operator enable the turbine high vibration trip, per Attachment B, “Restoring Turbine High Vibration Trip.”

Attachment B: (may be deferred until sheltering is complete)

The operator jumps to the mainline procedure, continuing with step #12.

Step #12 has an operator check whether the generator is being taken offline. For this scenario, the assumption is the reactor is going to be tripped, shutdown and brought to hot standby. The normal path is followed and the generator is to be taken offline.

Step #13 has an operator begin removing the 2nd stage re-heaters from service, using procedure SYS AC-322, “MSR 2nd Stage Reheat Operations.” The note before this procedure step advises, “During an emergency shutdown, if time is not available to completely cool-down the reheat lines the shutdown should not be delayed.” Step #13 is deferred until sheltering is complete.

Step #14 checks for reactor power less than 60%. The ultimate end point of this narrative is assumed to be a reactor that is shut down and at hot standby, so this step acts as a "hold point" before continuing with step #16.

Step #15 checks whether one main feedwater pump should be stopped, but this step may be bypassed at the option of the CRS. Given the time constraints, the operator bypasses this step.

Step #16 checks if the heater drain should be stopped, but this step may be bypassed at the option of the CRS. The operators are assumed pressed for time, so this step is bypassed.

Step #17 checks for reactor power less than 30%. This is a hold point before continuing with step #18.

Step #24 is conducted at the direction of the **SM**/**CRS** per RNO step #18, while continuing with the remaining steps of the procedure. Based on the procedure's basis document, feedwater preheating is not placed in-service, because we're headed for reactor shutdown rather than attempting to keep the plant operating at low power levels for a sustained piece of time.

The auxiliary boiler is assumed not started due to time constraints.

(These actions do increase the risk of S/G level instability during the down-power).

Step #26 has the operator transfer feedwater control to the bypass valves. The main feed regulating bypass valves are placed in automatic. (The scenario assumes that controls are placed in automatic to reduce the workload on the operator).

Step #27 checks to see if rod control should be placed in manual. Rod control is placed in manual once reactor power is at 15% (the C-5 interlock lights). Control rods are adjusted to maintain the desired reactor power (which in this scenario is to shutdown the reactor to hot standby). A recorder has its ranges transferred appropriate to the new power level.

Step #28 has the operator transfer loads to the startup transformer, as the final desired turbine load is less than 180 MW(e). Here, the final turbine load is to zero, as the reactor is brought to shutdown, hot standby.

Step #32 checks for reactor power between 8% and 10%. For this scenario, this will be treated as a "hold point", as the reactor is trending to shutdown and the reactor power will not be maintained stable between 8% and 5%. Once the reactor power is less than 8%, the operator continues with step #36.a.

Step #40.a has an RNO path to manually trip the reactor, using procedure EMG E-0, "Reactor Trip or Safety Injection." The RNO path is followed, given the scenario assumptions. At this point, further actions are assumed to be beyond the first hour of the event.

Termination path (expected actions are beyond the first 90 minutes of the event):

OFN SK-039:

Steps #19 through #21 (the procedures end-point). The longer-term closure of this event is assumed to involve termination of the security event and making "all clear" announcements over the telephone paging system or plant Gai-tronics system, making necessary offsite notifications, making e-plan announcements and executing the plant's accountability process.

OFN MA-038:

Step #13 has an operator begin removing the 2nd stage re-heaters from service, using procedure SYS AC-322, "MSR 2nd Stage Reheat Operations." The note before this procedure step advises, "During an emergency shutdown, if time is not available to completely cool-down the reheat lines the shutdown should not be delayed."

Step #15, which was bypassed earlier due to time constraints, is conducted now. One main feedwater pump is stopped, using Attachment A, "Shutdown of One Main Feedwater Pump."

Step #16, which was bypassed earlier due to time constraints, is conducted now. One heater drain pump is stopped.

SYS AC-322:

This procedure provides instructions for removing the second stage reheaters from service at power. The cool-down rate is not to exceed 125ºF / hour, a process which typically takes 2 hours to complete. Operations in this procedure are assumed to be **local**.

This procedure begins with step #6.1, "Removing 2nd Stage Reheat from Service."

Step #6.1.1 has an operator at the MSR control panel ensure that the main steam supply low load valves air-loading controllers are in manual. The operator hooks up a laptop if a LAN connection is installed, or contacts the control room if a LAN connection is not available. The operator continues at the MSR control panel, slowly opening the main steam supply load valves until the valves are full open.

Step #6.1.3 has the operator record temperatures every 5 minutes using Attachment A, "Hot Reheat Line to CIV Temperatures (3.1.3)," until the temperatures stabilize.

The CAUTION statement remarks that the low load valves should be adjusted to ensure the rate of change of temperature and difference in temperature between systems is within limits. The cool-down process is expected to take 2 hours. The NOTE statement references the valve locations and the need to monitor MSR outlet temperatures with a laptop or through maintaining communications with the control room.

Steps #6.1.4 through #6.1.6 involve closing the main steam supply load valves, decreasing the reheat inlet manual loading regulator pressure to zero, closing the main steam supply to

MSR 2nd stage isolation, and removing the 2nd stage reheater from service. Step #6.1.6 is the last step conducted in this procedure.

EMG E-0:

The reactor is tripped and this procedure is followed to bring the reactor to hot standby. Ultimately, a decision is made by a cognizant authority as to whether to bring the plant back to power or bring the plant to cold shutdown.

This On-Shift Analysis (OSA) is applicable to Analysis #10 identified in Appendix A **(Aircraft Probably Threat).** Analysis #10

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L1 T2/L3 T5/L1 T5/L3 T5/L4 T5/L5 T5/L7 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L11 T5/L6 T5/L9 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L2 T5/L11	No	No
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L4	No	No
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L5	No	No

Analysis #10

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
6	Nuclear Station Operator #4 (NSO#4)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L6 T3/L1	No	No
7	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L7 T3/L2	No	No
8	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L8 T3/L3	No	No
9	Nuclear Station Operator #7 (NSO#7)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L9 T3/L4	No	No
10	Nuclear Station Operator #8 (NSO#8)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T2/L10 T3/L5	No	No

Analysis #10

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
10	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	N/A	No	No
11	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	N/A	No	No
12	Radiation Protection Technician #2 (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	N/A	No	No
13	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown

Analysis #10

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #4	Nuclear Station Operator #4 (FBL)	Operations Training
7	Auxiliary Operator #5	Nuclear Station Operator #5 (Aux)	Operations Training
8	Auxiliary Operator #6	Nuclear Station Operator #6 (TB)	Operations Training
9	Auxiliary Operator #7	Nuclear Station Operator #7	Operations Training
10	Auxiliary Operator #8	Nuclear Station Operator #8	Operations Training
11	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A

TABLE 3 – Firefighting Analysis #10

Line	Performed By	Task Analysis Controlling Method
1	Station Operator #4 (Fire Brigade Leader) – dispatched for pre-staging	Fire Program Training and Drills
2	Station Operator #5 (Fire Brigade Member) – dispatched for pre-staging	Fire Program Training and Drills
3	Station Operator #6 (Fire Brigade Member) – dispatched for pre-staging	Fire Program Training and Drills
4	Station Operator #7 (Fire Brigade Member) – dispatched for pre-staging	Fire Program Training and Drills
5	Station Operator #8 (Fire Brigade Member) – dispatched for pre-staging	Fire Program Training and Drills

TABLE 4 – Radiation Protection & Chemistry

Analysis __#10__

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position: RP Tech #1	N/A – The performance of an in-plant survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure. No radiological release for this event.																	
2	On-Site Survey On-Shift Position	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure. No radiological release for this event.																	
3	Personnel Monitoring On-Shift Position: RP Tech #1	N/A – Personnel can out-process from the Radiologically Controlled Area (RCA) using portal and small article monitors. If necessary, site evacuees would be monitored after arrival of augmented ERO personnel.																	
4	Job Coverage On-Shift Position: RP Tech #2	N/A – Will be dispersed to GOB 1st Floor to await further direction.																	
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	N/A – Will be dispersed to GOB 1st Floor to await further direction. No radiological release for this event.																	
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling required until the Technical Support Center is staffed per AP 15C-003. .																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation Analysis #10

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	N/A for Alert	N/A
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this Event	Operations Training and EP Training/Drill Program
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Control Room Supervisor	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and EP Training/Drill Program

Event #11 Station Blackout

Narrative

Station blackout is considered a "Beyond Design Basis" accident that is outside the scope of USAR § 15.0, "Accident Analysis." The regulatory basis for addressing "Loss of all alternating current power" AKA "station blackout" is specified in 10 CFR 50.63 and described in NRC Reg Guide 1.155, "Station Blackout":

> *The term "station blackout" refers to the complete loss of alternating current electric power to the essential and nonessential switchgear buses in a nuclear power plant. Station blackout therefore involves the loss of offsite power concurrent with turbine trip and failure of the onsite emergency ac power system, but not the loss of available ac power to buses fed by station batteries through inverters or the loss of power from "alternate ac sources."*

The Reg Guide continues:

> *Because many safety systems required for reactor core decay heat removal and containment heat removal are dependent on ac power, the consequences of a station blackout could be severe. In the event of a station blackout, the capability to cool the reactor core would be dependent on the availability of systems that do not require ac power from the essential and nonessential switchgear buses and on the ability to restore ac power in a timely manner.*
>
> *As a minimum, the following potential causes for loss of offsite power should be considered:*
>
> 1. *Grid under-voltage and collapse*
> 2. *Weather-induced power loss*
> 3. *Preferred power distribution system faults (includes such failures as the distribution system hardware, switching and maintenance errors, and lightning-induced faults) that could result in the loss of normal power to essential switchgear buses.*
>
> *The evaluation should be performed assuming that the station blackout event occurs while the reactor is operating at 100% rated thermal power and has been at this power level for at least 100 days.*
>
> USAR § Appendix 8.3A addresses the station blackout capacity of the plant. The WCGS electrical power system reliability and environmental characteristics were evaluated in USAR § 8.3A.3.1, "AC Power Design Characteristic Group":
>
> > *Group P1 includes those sites characterized by redundant and independent power sources that are considered less susceptible to loss as a result of plant-centered and weather-initiated events. Based upon NUMARC 87-00 guidance, Wolf Creek is determined to be in AC Power Design Characteristic Group, P1.*

USAR § 8.3A.3.2, "Emergency AC Power Configuration Group," continues:

> *Wolf Creek is determined to be in the emergency AC power configuration group C (EAC Group C). After the likelihood of losing off-site power, the redundancy of the emergency AC power system is the next most important contributor to station blackout risk. With greater EAC system redundancy, the potential for station blackout diminishes, as does the likelihood of core damage. The importance of EAC redundancy is reflected through the use of four distinct EAC configuration groups. Those sites in group C have typical redundant and independent EAC sources to safe shutdown equipment.*
>
> *The Wolf Creek designation of Group C is based on the following:*
>
> *1) There are two emergency AC power supplies not credited as alternate AC power sources; and*
>
> *2) One emergency AC power supply is necessary to operate safe shutdown equipment following a loss of off-site power.*

The conclusion was made that WCGS could sustain a station blackout condition for up to four (4) hours.

Document APF 06-002-03, EAL Classification Matrix, identifies this as a **Site Area Emergency** based on **SS1.1**, "Loss of ALL offsite and ALL onsite AC power to emergency 4.16KV buses NB01 and NB02 for ≥ 15 min." This scenario assumes the power is recovered within 4 hours. If it is determined that a station blackout would continue for more than 4 hours, the event would escalate to a **General Emergency** based on **SG1.1** "Prolonged loss of ALL offsite and ALL onsite AC power to emergency buses".

Consistent with assumptions described in Reg Guide 1.155, Appendix B, "Guidance Regarding System and Station Equipment Specifications," the initiating event and analysis is assumed to involve a station blackout, without the additional complications of a design-basis accident.

For this event, the operators start with procedure EMG E-0, "Reactor Trip or Safety Injection." (A loss of all power will cause the control rods to drop automatically).

EMG E-0:

Steps #1 **(RO#1)** (verify reactor trip) and #2 **(RO#2)** (verify turbine trip) follow the normal path. Step

#3 **(RO#1)** involves checking the AC emergency busses. The normal path assumes at least one AC emergency bus is energized. Since this event involves a station blackout, the RNO path is followed instead. The emergency diesel generators fail to energize any AC emergency bus. The operator then goes to procedure EMG C-0, "Loss of All AC Power."

EMG C-0:

Steps #1 **(RO#1)** and #2 **(RO#2)** are duplicative of the above EMG E-0 steps #1 and #2, and were added to this procedure in case an operator (seeing the loss of power), jumped to EMG C-0 directly rather than going through EMG E-0 first.

Step #3 **(RO#2)** RNO path lists manual operations, but no local operations were identified.

Step #4 **(RO#1/NSO#5)** involves checking if the RCS is isolated. The last sub-step requires an operator to **locally** close the RCS and pressurizer sample line isolation valves at 3 locations in the **aux building**.

Steps #5 - #7 – the RNO paths have manual operations, but no local operations were identified. **(RO#2)** Bus fault clearance can be performed by NSO if required.

Step #8 evaluates the availability of EDG's. **(RO#1/NSO#6)**

Step #9 involves manually starting both diesel generators from the control room. The RNO path goes to procedure OFN KJ-032, "**Local** Emergency Diesel Startup,") if starting the diesels from the control room fails. EMG C-0 steps continue concurrently with OFN KJ-032. **(RO#2/NSO#6)**

OFN KJ-032:

An operator **(NSO#6)** attempts to start both diesel generators **locally**. (For this analysis, "Fire in the Control Room," is outside the scope of the event).

The procedure outlines manual operations **(NSO#6)** to try to start emergency diesel generator A using a mallet switch, then by trying a local start pushbutton, then by trying an air start valve. The last RNO step, if emergency diesel generator A fails to start, is to notify **mechanical maintenance** with a **repair request**. The same chain of events is followed for attempts to start emergency diesel generator B. Repair will occur when augmented staff arrives.

For this analysis, it's assumed that neither emergency diesel generator starts. **Mechanical maintenance** is contacted to repair both of the generators. Mitigating actions will continue and repair will occur when augmented staff arrives. The operator jumps back to procedure EMG C-0, Step #10 which is already in progress.

EMG C-0:

Step #10 involves ensuring electrical power to at least one emergency bus. Based on the scenario, the RNO path is followed. Any emergency diesel generators that had been successfully started, but weren't able to be loaded onto a bus are stopped. The RNO path continues, with an operator trying to energize affected AC busses from any available power supply, going with procedure OFN NB-030, "Loss of AC Emergency Bus NB01 (NB02)," while continuing with the current procedure. **(RO#1/NSO#6)**

OFN NB-030:

Step #1, the RNO path, directs anyone entering into this procedure from EMG C-0 to jump immediately to Attachment A, Step #A14 (for NB01) or Attachment B, step #B14 (for NB02). **(RO#1)**

Step #A14 and #A15 checks the bus lockout relay. The RNO path acts to shut down the emergency diesel generators if they had started but were unable to load to the NE01 and NE02 busses. **(RO#1)**

Step #A16, the RNO path, assumes the emergency diesel generators are not running, which is consistent with the scenario. There are attempts to energize NB01 from a non-diesel source, XNB01 or XNB02 (Engineered Safety Features transformers). There are also discussions on trying to start emergency diesel generator "A", following the same procedure as was previously discussed in EMG C-0, Step #8; those actions are therefore assumed to already be in progress. **(RO#1/NSO#6)**

Step #A17 checks if NB01 is energized from NE01. The RNO path assumes that NB01 is NOT energized (emergency diesel generator A hasn't started). There are also actions to reset the anti-pumping circuit, by ensuring the NB01 normal, alternate and emergency supply breakers are properly set. Given the station blackout scenario, NB01 is assumed not energized. **(RO#1)**

Step #A18 has steps to manually energize the NB01 bus; the RNO path is followed and the emergency diesel generators are assumed to not be running. **(RO#1)**

Step #A19 starts a search for any available offsite power. (See USAR § 8.2, "Offsite Power Systems," for a description of the available ac power sources). Following the RNO path that the ESF transformer is not energized by offsite power, the event assumes that the SL7 bus (13.8 kV) is not energized either. The next RNO sub-step, #A19(b)(2) is to perform procedure SYS SY-120, "Sharpe Diesel Operation and Alignment to Site," to energize XNB01. **(RO#1)**

SYS SY-120:

SYS SY-120 provides the instructions to "black-start" the Sharpe Diesel to provide power to the Wolf Creek Switchyard. Note that the Sharpe Station can only supply one NB bus. NB01 is preferred over NB02. **(RO#1/NSO#8)**

For the purpose of this analysis, per Reg Guide 1.155, § B, "Discussion," and consistent with the 10 CFR 50.2 definitions for "Alternate ac source" and "Station blackout," the operations of SYS SY-120 are assumed successful.

The SYS SY-120 procedure starts with step 6.1, "Sharpe Diesel Generator Availability Checks," which requires **local** operations in the **Sharpe sub-station house**. The **substation north of Sharpe Station** is checked for items that could degrade the ability of the Sharpe Station to provide power to Wolf Creek. **(RO#1/NSO#8)**

Step 6.2 involves "Starting the Diesels." The 69 kV bus breakers are opened. Also, **Westar** and **Lyon Coffey Electric Coop** are directed to take actions. The remaining actions are performed in the **Sharpe sub-station house**. Operations include starting the Sharpe diesel and closing feeder breakers. **(RO#1/NSO#8)**

Step 6.3 involves "Aligning Sharpe Diesels to NB01 / NB02." Note that Attachment C of OFN NB-030 has nearly identical steps listed, but since the operator is already in the switchyard, this procedure's series of steps should be followed when energizing the bus. **Breakers are manipulated in the switchyard. Bus-side disconnects** using **hot sticks** are performed by **qualified individuals**. Also, **Lyon Coffey Electric Coop** is directed to take actions. Various breakers continue to be manipulated as an NB bus is supplied (NB01 is preferred over NB02). **(RO#1/NSO#8)**

After a 2-minute delay, the operator returns to procedure OFN NB-030.

OFN NB-030:

Continuing with step #A18, using the RNO path, the operator goes to the next step. **(RO#1)**

Step #A20 re-energizes the NB01 bus from the offsite power supply. (If that fails, the RNO path is to re-energize NB02). Based on the scenario, re-energizing NB01 is assumed successful. The procedure jumps to step #A25. **(RO#1)**

Step #A26 has a check that EMG C-0, "Loss of All AC Power," is not in effect. The RNO path has a provision that if bus NB02 is not energized (it isn't the Sharpe Diesel can energize either NB01 or NB02, but not both simultaneously), the RNO path sends the operator **(RO#1)** to step #B14 to try to energize NB02.

Step #B14 and #B15 checks the NB02 bus lockout relays. **(RO#1)**

Step #B16 checks for a running emergency diesel generator NE02. Based on the scenario, the RNO path is followed and NE02 cannot be started from the control room. Procedure OFN KJ-032, local emergency diesel startup would normally be followed however this step has already been executed using EMG C-0, Step #8. **(RO#1/NSO#4)** The next action is step #B19.

Step #B19 checks to see if a normal offsite power supply is available. Per the scenario, it is not and the RNO path is followed. **(RO#1)** The next action is step #B21.

Step #B21 checks for alternate offsite power. **(RO#1)** A sub-step checks that XNB01 is energized from offsite power. The RNO path jumps to Attachment C, "Placing XNB01 on SL7," however as noted above, Step #6.3 of procedure SYS SY-120 has already executed this step. Continue to step #B24.

Step #B24 checks for the ability to energize NB02 from the SBO Diesels.

SYS KU-122:

The SYS KU-122 procedure starts with Section 6.1, "Energizing NB02 From SBO DGs," which requires control room and **local** operations.

The control room operator performs step 6.1.1 at the sequencer and 6.1.2 in the control room placing applicable switches in pull to lock inside the control room. **(RO#1)**

Local operator actions include performance of Attachment A, "Starting the SBO DGs for NB02." **(NSO#6)**

OFN NB-030:

Step #B26 is to check that EMG C-0, "Loss of All AC Power" is not in effect. The RNO path is to return to the calling procedure and step in effect. Based on the scenario, the operator jumps to procedure EMG C-0, step #9, which was already in progress. As the basis document notes, "if power is available to only one train, the operator should initiate attempts to restore power to the other train while continuing in the procedure to deal with the emergency condition." **(RO#1)**

EMG C-0:

Based on Reg Guide 1.155, no complicating 'design basis events' have occurred concurrently with the station blackout, so any RNO paths involving non-blackout-related equipment malfunctions, fuel damage, etc., or other situations that could place the plant into a design-basis or beyond-design-basis accident are outside the scope of this scenario.

Step #11 checks that at least one NB bus is energized. Here the RNO path is followed, based on the emergency busses NB01 and NB02 not being energized yet. **(RO#1/NSO#4)** The actions jump to step #14.

Steps #15 has the operator place the ECCS pump switches and other equipment in the "pull to lock" position, in order to defeat automatic loading of large loads on the AC emergency bus. **(RO#2/NSO#5)**

Step #16 has operators **locally** close valves to isolate the reactor coolant pump seals. **(RO#2/NSO#5)**

Step #17 checks if AC power can be restored within 4 hours. **(NSO#7/NSO#8)**

Step #18 evaluates whether the TSC diesel and/or a diesel driven fire pump should be started. **(NSO#7)** The bus supplying the motor driven fire pump is checked to see if it is energized. Another check is made to determine whether the permanent diesel driven fire pump is running. The RNO path regarding the permanent diesel driven fire pump is to place a temporary diesel driven fire pump in-service per SYS FP-290, "Temporary Fire Pump Operations." For this particular scenario, the permanent diesel driven fire pump is assumed to be properly running.

This event assumes loss of offsite power, so a Nuclear Station Operator **(NSO#7)** is directed to start the TSC diesel using procedure STN KAT-001, "Technical Support Diesel Generator Operation."

STN KAT-001:

An operator **locally** performs the prerequisite checks listed in § 7, "Prerequisites." **(NSO#7)**

An operator **locally** performs § 8.1, "Testing Installed TSC Diesel Generator" **OR** § 8.2, "Testing Temporary TSC Diesel Generator." **(NSO#7)**

Note that if the TSC Diesel Generator runs for more than an hour, then refer to Attachment B, "TSC Diesel Generator Reading," or if applicable, Attachment C, "TSC Temporary Diesel Generator Readings," to conduct hourly checks on the diesel generator in question.

EMG C-0 (continued):

Step #19 involves operators **(NSO#6)** establishing emergency ventilation to provide emergency cooling to vital plant equipment. An operator is dispatched to **locally** open doors for the Turbine Driven Auxiliary Feedwater Pump Room using Attachment A, "Door Alignment in Auxiliary Feedwater Corridor for Loss of All AC." (Attachment A identifies specific locations of the doors and is a single page long). An operator also opens cabinet doors and control building doors, using Attachment B, "Door Alignment in Control Room for Loss of All AC" (Attachment B identifies equipment cabinet and control building door locations and is 3 pages long). Security will be performing compensatory measures.

Step #20 checks whether the safety injection (SI) accumulator tank outlet isolation valves are open. **(RO#2)**

Step #21 checks to see if the condensate storage tank (CST) is isolated from the hotwell. The RNO path has an operator **locally** close the isolation valves. **(RO#2/NSO#6)**

Step #22 checks to ensure the main steam line isolation valves, main steam line isolation bypass valves and main steam line low point drain valves are closed. The RNO path for isolating the bypass valves is having an operator **locally** closing the valves. The RNO path for isolating the drain valves is to have an operator **locally** close the valves. **(RO#2/NSO#5)**

Step #23 verifies feedwater isolation. The RNO path for most of the sub-steps is manually closing the valves. Sub-step (e) RNO path has a further step to have an operator **locally** isolate the main feedwater chemical injection valves. **(RO#2/NSO#5)**

Step #24 verifies blowdown isolation on all S/G's. The RNO path has the operator try to close the valves manually. If that fails, an operator **locally** isolates the lines. **(RO#2/NSO#5)**

Step #25 checks to see whether the S/G's are faulted. The scenario assumes the S/Gs are intact, as there is no design-basis or beyond-design-basis accident to complicate matters. **(RO#2)**

Step #26 checks to see whether the S/G tubes are intact. **Radiation protection** is directed to survey steam lines in Area 5 of the Auxiliary building, and to **locally** check S/G steam line radiation monitors and turbine driven auxiliary feedwater pump exhaust levels. The normal path is followed ("no complicating design basis events.") **(RO#2/RP#1)**

Step #27 checks for intact S/G levels. The normal path is followed for this scenario. **(RO#2)**

Step #28 has operators **(RO#2/NSO#4) locally** shed non-essential AC and DC loads, using Attachment C, "AC and DC Load Shedding." This step also discusses disconnecting the NK batteries from the bus when the voltage drops below 105 VDC. Design capacity of the Class 1E batteries is 240 minutes, so this voltage drop is not expected to be an issue during the first hour of the event.

Step #29 to depressurize the main generator is assumed conducted after the first hour.

Step #30 checks the condensate storage tank level. Thus, the normal path is followed. **(RO#2)**

Steps #31 and #32 monitor the RCS inventory and checks if intact S/Gs should be depressurized to 310 psig. The scenario assumes a normal cooldown, so the operator follows the normal path. No local operations have been identified for either step. **(RO#2)**

Step #33 checks if reactor is subcritical. **(RO#1)**

Step #34 checks if S/G depressurization should be stopped. **(RO#1)**

Step #35 checks for SI signal actuation. The scenario assumes the RNO path this early in the event, given an assumed cooldown rate no greater than 100 °F/hr. **(RO#1)**

Step #36 resets SI. **(RO#1)**

Step #37 verifies containment isolation phase A. This step has manual operator actions**.** **(RO#1/NSO#5)**

Step #38 verifies containment purge isolation. **(RO#2)**

Step #39 verifies containment isolation phase B – not required. **(RO#2)**

Step #40 checks core temperature < 1200 °F (this tests for a severe accident). The scenario assumes a station blackout without the additional complications of a design-basis or beyond design-basis accident, per Reg Guide 1.555. The normal path is followed. **(RO#1)**

Step #41 checks plant conditions**.** RNO path directs to go to Step #43**.** **(RO#2)**

Step #43 monitors the spent fuel pool parameters and is assumed conducted after the first hour. **(RO#2)**

Step #44 checks to see if emergency AC power is restored yet. The scenario assumes a station blackout, so the RNO path is followed. Sub-part (a) of the RNO path includes operator steps to check the status of **local actions**, and to **locally** check the boric acid tank (BAT) temperatures. **(RO#2/NSO#5)**

Operator loops back to step #25, "Check if S/Gs are not Faulted" and continues the loop until the Step #44 question, "Check if AC Emergency Power is Restored" can be answered with a normal path. **(RO#1/RO#2/CRS)**

Termination path (expected actions are beyond the first 90 minutes of the event):

EMG C-0

Step #30 has operators check CST to AFP suction header pressure. The RNO path has operators **locally** close valves to the condensate store tank, acquire appropriate tooling from an emergency locker, and connect a fire hose. Once the fire hose is connected, operator ensures diesel driven pump is running, **locally** operate valves and pressurize the fire hose. **(RO#2/NSO#5/NSO#6/NSO#7)**

Step #43 checks the spent fuel pool level. The normal path is assumed to be followed at this stage of the scenario, since this procedure's Figure 1, "SFP Time to Boil" graph shows boiling doesn't start to occur until at least 30 hours into the event. **(NSO#5)**

The longer-term closure to this event is assumed to involve executing Steps #45 to #54 of this procedure. Operator actions specifically include, stabilizing S/G pressures, re-setting safety injection to permit manual loading of equipment on the AC emergency bus, loading up equipment on energized AC emergency busses (once the busses are restored), re-energizing DC loads and battery chargers, restoring power to Security inverters and verifying the Red Train and Yellow Train ESW operations.

At the end of step #54, sub-step (d), the operator is assumed to ultimately jump to procedure EMG CS-01, "Loss of All AC Power Recovery Without SI Required," step #1, to close out the event.

Analysis 11
Station Blackout
On-Shift Staffing Analysis Report
Revision 2

This On-Shift Analysis (OSA) is applicable to Analysis #11 identified in Appendix A **(Station Blackout).**

Analysis #11

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L11 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L2	No	No
4	Reactor Operator #1 (RO#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L4	No	No

Analysis #11

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L5	No	No
6	Nuclear Station Operator #4 (NSO#4)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L6	No	No
7	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L7	No	No
8	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L8	No	No

Analysis #11

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
9	Nuclear Station Operator #7 (NSO#7)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L9	No	No
10	Nuclear Station Operator #8 (NSO#8)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L10	No	No
11	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L5 T4/L6	No	No
12	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L1 T4/L3	No	No
13	Radiation Protection Technician #2 (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L4	No	No
14	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T5/L15	No	No

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown Analysis #11

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #4	Nuclear Station Operator #4 (FBL)	Operations Training
7	Auxiliary Operator #5	Nuclear Station Operator #5 (Aux)	Operations Training
8	Auxiliary Operator #6	Nuclear Station Operator #6 (TB)	Operations Training
9	Auxiliary Operator #7	Nuclear Station Operator #7 (FBM)	Operations Training
10	Auxiliary Operator #8	Nuclear Station Operator #8 (FBM)	Operations Training
11	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
12	Mechanic	N/A	N/A
13	Electrician	N/A	N/A
14	I&C Technician	N/A	N/A
15	Other	N/A	N/A

TABLE 3 – Firefighting Analysis #11

Line	Performed By	Task Analysis Controlling Method
1	N/A – there is no fire associated with this event.	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

TABLE 4 – Radiation Protection & Chemistry

Analysis __#11__

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position: RP Tech #1 Main Steam Line surveys							X	X	X	X	X							
2	On-Site Survey On-Shift Position	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure. No radiological release for this event.																	
3	Personnel Monitoring On-Shift Position: RP Tech #1	X	X	X	X	X	X						X	X	X	X	X	X	X
4	Job Coverage On-Shift Position: RP Tech #2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling required until the Technical Support Center is staffed per AP 15C-003.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation Analysis #11

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this event	N/A
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and EP Training/Drill Program

Event #12 Fire with Control Room Evacuation And Remote Shutdown

Narrative

This is a scenario as categorized by the NRC, which is outside the scope of the classical design basis accidents as defined by the USAR.

As noted in USAR § 1.2.6, "Plant Instrumentation and Control Systems":

> *Additional controls at appropriate locations outside the control room (in particular, an auxiliary shutdown panel in the auxiliary building) ensure the capability of reaching and maintaining a post-accident or post-fire shutdown condition in the unlikely event that the control room becomes uninhabitable.*

USAR Table 7.4-1.1, "Auxiliary Shutdown Panel Controls and Monitoring Instruments," list the controls and monitoring indications available at the plant. USAR Table 7.4-1.2, "Controls at Switchgear Motor Control Centers, and Other Locations," identifies other locations available to support remote shutdown of the plant.

USAR §7.4.6 discusses the problem of "Safe Shutdown from Outside the Control Room," including identifying the locations and capabilities of the remote shutdown panels.

> *If temporary evacuation of the control room is required because of some abnormal plant condition, the operators can establish and maintain the plant in a hot standby condition from outside the control room through the use of controls located at the auxiliary shutdown panel, at the switchgear, or at motor control centers, and other local stations. Hot standby is a stable plant condition, automatically reached following plant shutdown. The hot standby condition can be maintained safely for an extended period of time. In the unlikely event that access to the control room is restricted, the plant can be safely kept at a hot standby, until the control room can be reentered, by the use of the essential monitoring indicators and the controls listed in Tables 7.4-1.1 and 7.4-1.2.*
>
> *The auxiliary shutdown panel room is located in the northeast corner of the auxiliary building one level below the control room at Elevation 2026. There are two distinct auxiliary shutdown panels at this location; one panel is associated with instrumentation and control circuits used for controlling safe shutdown equipment in train A, and the other panel is associated with instrumentation and control circuits used for controlling safe shutdown equipment in train B. Both panels are electrically separated and are associated with the same safety-grade circuits that serve their respective trains.*
>
> *The auxiliary shutdown panel design also provides electrical isolation of instrumentation and control circuits for the equipment controlled between train B auxiliary shutdown panel and the control room. Switches are provided on B auxiliary shutdown panel to isolate and remove control from the control room for the train B safe shutdown equipment necessary to take the plant to and maintain the plant in a safe hot standby condition independent of the control room. This capability is assured in the event a postulated fire causes damage in the control room and subsequent evacuation of the operators.*

USAR Table 9.5.2-1, "Communications Systems in Plant Areas Required to be Manned for Post Fire Safe Shutdown Following Control Room Evacuation," lists locations around the plant and communications equipment available for responding to this category of event.

Document APF 06-002-03, EAL Classification Matrix, identifies this as an **Alert** based on **HA6.1,** "Control Room evacuation resulting in transfer of plant control to alternate locations" If establishing control at the auxiliary shutdown panel require more than 15 minutes, this escalates the event to a **Site Area Emergency** based on **HS6.1** "Inability to control a key safety function from outside the Control Room".

Operator actions start with procedure OFN RP-017, "Control Room Evacuation."

OFN RP-017:

The procedure starts with a note prefacing Step #1:

> *The fire brigade is dedicated to fighting the Control Room fire. They are not responsible for performing any of the operator actions described in this procedure.*

Step #1 - The scenario evaluated here postulates that the control room has a fire and that loss of the control room controls is imminent. The scenario is not so drastic as to assume an "instant evacuation" of the control room is required, so the normal path is followed. **(SM)**

Step #2 has the operator trip the reactor. **(RO#1)**

Step #3 has the operator close MSIVs. **(RO#2)**

RO#2 and **NSO#3** are now available to perform OFN Auxiliary and Turbine Building actions.

Step #4 on the normal path has an operator make an announcement over the Gai-tronics that the control room is being evacuated due to the fire. The **fire brigade** is called out. **Fire brigade** response actions are detailed in procedure AP 10-106, "Fire Preplans." **(SM)**

Step #5 has the **SM** obtain dosimetry and protective equipment from the control room emergency locker. CAS personnel receive directions, various breakers are switched off, a radio is picked up, and Attachment A, "Shift Manager Actions," is entered.

Step #6.A has the operator performing turbine building actions, proceed to PA01/PA02 and perform actions of ATTACHMENT B, TURBINE BUILDING ACTIONS. **(NSO#3)**

Step #6.B has the reactor operator proceed to NK switchgear rooms and perform actions of ATTACHMENT C, REACTOR OPERATOR ACTIONS. **(RO#1)**

Step #6.C has the operator performing aux building actions, proceed to 2026' RDMG set room and perform actions of ATTACHMENT D, AUXILIARY BUILDING ACTIONS. **(RO#2)**

Step #6.D has the offsite communicator proceed to TSC. **(WCSRO)**

Step #6.E has the ENS communicator proceed to TSC and establish and maintain continuous communications with the NRC via the ENS emergency telecommunications system (ETS) telephone. **(WCSRO)**

Step #6.F has operator closing BN HV-8812A, RWST to RHR PUMP A SUCTION ISOLATION VALVE proceed to ESF switchgear room B and perform actions of ATTACHMENT E, BN HV-8812A AND AUX FEEDWATER VALVE CLOSURE. **(CRS)**

At this point, the last licensed operator has left the control room. Should the operators be unable to establish control of the plant at the remote shutdown panel within 15 minutes, the plant will escalate this to a **SITE AREA EMERGENCY**.

If the supply of operators is constrained, the steps in Attachment F, "Actions to Protect Train A Equipment" are deferred until all of the steps in Attachments A through E are complete. If there are available personnel, the steps in Attachment F may be executed concurrently with Attachments A through E. **(NSO#3)**

Attachment A: Shift Manager Actions

Step #A1 has the **SM** place several control room isolation switches to isolate.

Step #A2 has the **SM** close the S/G A and S/G C ARVs.

Step #A3 has the **SM** check to see if the RCS cold leg temperatures are stable at or trending to 561 ºF. The RNO path has an operator **locally** dump steam using the S/G B and D ARVs, until the temperature is less than 561 ºF and decreasing.

Steps #A4 through #A6 checks that the CST to MD-AFW B is open, the AFW valves are lined up, and that the reactor operator is notified that the Motor Driven AFW Pump B valve lineup steps are complete. (**SM/RO#1)**

Step #A7 has the **SM** assess the stability of plant conditions. Specific checks are conducted to verify that the RCS pressure, pressurizer level, S/G wide range levels and RCS cold leg temperatures are all within acceptable ranges. The RNO path for sub-step (b) tasks the operator performing turbine-building actions **(NSO#3)** to **locally** throttle the boron injection tank (BIT) outlet valve as needed.

Step #A8 has the Shift Manager classify the event and direct the offsite communicator to make the pre-approved **ALERT** or **SITE AREA EMERGENCY** notification, as appropriate, for the plant conditions. **(WCSRO)**

Step #A9 checks that the ESW to TDAFW pump isolation valve is closed. (**SM)**

Step #A10, has the **SM** contacts the operator **(NSO#3)** performing Attachment B, "Turbine Building Operations," to verify an open valve. The RNO path shows manual operations as needed.

Steps #A11 and #A12 has the **SM** place the turbine driven aux feedwater pump governor control to local and verifies the aux feedwater valve line-up for the turbine-driven aux feedwater pump.

Steps #A13 through #A15 has the **SM** ensure the Loop B steam line isolation to the AFP turbine is open, the Loop C steam isolation is closed, and the turbine mechanical trip/throttle valve is open.

Step #A16 has the **SM** contact the operator **(NSO#3)** performing Attachment E, "BN HV-8812A and Aux Feedwater Valve Closure," to ensure the AFW valves are closed. This is a "hold point" before continuing on with step #A17.

Step #A17 has the **SM** establish turbine driven AFW pump control.

Step #A18 has the **SM** align alternative AFW pump water source, when CST level is less than 14% or local CST level is less than 6'5". (The RNO path has the rest of this step conducted after those levels are achieved, and otherwise continues with step #A19).

Step #A19 directs an available operator to perform Attachment F, "Actions to Protect Train A Equipment," if that hasn't already been started earlier. **(SM/RO#1)**

Step #A20 has the **SM** check plant cooldown status. The normal path assumes that cooling the plant down from "Hot Standby" to "Cold Shutdown" is not desired. For this scenario, the RNO path is taken instead. The scenario assumes that if the control room is (or was) on fire, WCGS is not going to be back at power until after the NRC has investigated the incident.

The **SM** then jumps to procedure OFN RP-17A, "Hot Standby to Cold Shutdown From Outside the Control Room Due to Fire," when TSC augmentation is complete.

Attachment B: Turbine Building Actions

Step #B1 has an operator **locally** trip the RCPs.
(NSO#3)

Steps #B2 and #B3 have the operator proceed to 2033' turbine to obtain a copy of the procedure, a radio, a flashlight, and dosimetry from the emergency locker. **(NSO#3)**

Steps #B4 and #B5 have the operator open breakers for DC control power to PA01 and PA02.
(NSO#3)

Step #B6 has the operator ensure the RCP breakers are tripped.
(NSO#3)

Step B7 verifies with SM at ASP that Step #5(c), "placing breakers on NG03C are off" is completed. This is a "hold point" before continuing with Step #B7(b). The operator then ensures the CST to turbine driven AFP suction isolation valve is open. **(NSO#3)**

Step #B8 has the operator go through a hatch, descend a ladder, and enter the RCA. **(NSO#3)**

Step #B9 has the operator close the CCP to regen HX valves in the NCP room. **(NSO#3)**

Step #B10 has the operator isolate the CCW from RCP thermal barriers in the north mechanical penetration room. There is a statement echoing step #B7 that the operator needs to verify with the SRO that step 5(c), "placing breakers on NG03C are off" is completed. This is a "hold point" before continuing with step #B10(b). The operator then ensures that EG HV-61 is ensured

closed. The operator then verifies with the operator at the aux building that Attachment D, step D10 is complete. This is a "hold point" before continuing with step #B10(d), where EG HV-133 is ensured closed. **(NSO#3)**

Step #B11 has the operator **locally** close valves to isolate the RCP seals in Aux Building Filter Alley. The operator then informs the reactor operator that Steps B10 and B11 are done. **(NSO#3)**

Step #B12 has the operator fail the MSIV bypass valves closed at RP209, across from the north mechanical penetration room. **(NSO#3)**

Step #B13 has the operator verify the BIT isolation valves open. Sub-step (a) has the operator verify with person performing aux building actions that Attachment D, steps D4 through D5 are complete. This is a "hold point" before continuing with step B13(b). **(NSO#3)**

The operator then goes to the north piping penetration room to **locally** close a BIT outlet valve and **locally** throttle open a BIT outlet isolation valve. The SM is notified that the BIT is lined up for injection, and then EM HV-8801B is throttled as directed by the SM to control the pressurizer level. **(NSO#3)**

Step #B14 has the SM contacted at the ASP for further direction. **(NSO#3)**

Attachment C: Reactor Operator Actions

Step #C1 has the operator exit the control room, has the operator ensure that at least one control room outer door is closed and then has the operator proceed to the NK switchgear rooms. **(RO#1)**

Step #C2 has the operator turn off a series of NK breakers. **(RO#1)**

Steps #C3 and #C4 have the operator proceed to the NB02 switchgear room to obtain a copy of the OFN RP-017 procedure, a radio and flashlight from the emergency locker. **(RO#1)**

Steps #C5 and #C6 have the operator ensure the train B pump breakers are open and the feeder breakers to NB02 are also open. **(RO#1)**

Step #C7 has the operator ensure the ESA and ESB relays are energized. **(RO#1)**

Step #C8 has the operator align EDG B to the bus. The RNO path assumes the diesel has not started. If the RNO path is followed, the operator obtains a handle from the emergency locker and places it at one of the available air start valves. The handle is then pulled down until the diesel starts. The scenario assumes the rest of the sub-steps follow the normal path, once the diesel has started. The EDG output breaker is closed and the NB02 voltage on the breaker is verified as normal. **(RO#1)**

Steps #C9 and #C10 have the operator ensure the ESW pump B breaker is closed and the load center and ESW pumphouse MCC breakers are closed. The RNO path uses Attachment G, "Manual Charging of Siemens Circuit Breakers" to charge the breaker closing springs. **(RO#1)**

Steps #C11 through #C13 have the operator isolate control power to NG02, position a valve for the ESW B/Service Water Cross-Connect, and isolate control power to NG04. **(RO#1)**

Step #C14, sub-step (a) has the operator verify that the SM performing Attachment A has completed steps A4 through A5. This is a "hold point" before continuing with step #C14(b). **(RO#1)**

Sub-steps (b) and (c) have the operator start the motor driven AFW pump B and then notify the SM that the pump is running. (The RNO path, not followed for this scenario, would direct the operator to Attachment G). **(RO#1)**

Steps #C15 ensures the containment spray pump A is also stopped. **(RO#1)**

Step #C16, has the operator align the ESW pump room ventilation. **(RO#1)**

Steps #C17 through #C21 have the operator position switches for the ESW to UHS isolation valves, the RWST to RHR pump B isolation valves, the RWST to CCP B suction valves, close the VCT outlet isolation valve, and open a charging pump mini flow isolation valve. **(RO#1)**

Step #C22, sub-step (a) contacts the operator performing Turbine Building Attachment B to ensure step #B10 is complete. This is a "hold point" before continuing with step #C22(b). **(RO#1)**

Sub-step (b) closes NB0206. The RNO path (not followed for this scenario) has the operator close NB0207 to start CCW pump D, and then if no CCW pump can be started, to go to Attachment G. **(RO#1)**

Step #C23, sub-step (a) ensures the Turbine Building Attachment B, Step B11, is complete and auxiliary building, steps D4 through D10 are also complete. These are both "hold points" before continuing with step #C23(b). **(RO#1)**

Sub-step (b) closes NB0201. The RNO path would have directed the operator to go to Attachment G. **(RO#1)**

Step #C24 has the operator inform the SM that the CCW and CCP pumps have been started. **(RO#1)**

Step #C25, has the operator align the diesel generator building ventilation. **(RO#1)**

Step #C26 has the operator isolate possible RCS leakage paths. **(RO#1)**

Step #C27 has the operator open breaker for S/G blowdown isolation valves. **(RO#1)**

Step #C28 has the operator start the EDG fuel oil transfer pump. **(RO#1)**

Step #C29 has the operator verify the EDG B room temperature is between 65 ºF and 110 ºF. **(RO#1)**

Step #C31 has the operator contact the SM at the auxiliary shutdown panel for further direction. **(RO#1)**

Attachment D: Auxiliary Building Actions **(RO#2) (NSO#4 is FBL)**

Step #D1 has an operator in the Rod Drive M/G Room, isolate normal letdown at the RC and Support Systems Control Panel. **(RO#2)**

Steps #D2 and #D3 has an operator proceed to the emergency locker at the 2026' level and obtain a copy of procedure OFN RP-017, get a radio, a flashlight, a FR jump suit, and a pair of circular soft-jawed pliers. **(RO#2)**

Steps #D4 and #D5 have the operator operate breakers and switches, then isolate power to the BIT outlet valve. **(RO#2)**

Step #D6, sub-step (a), has the operator verify with the SM at ASP that step 5.c is complete. This is a "hold point" before continuing with step #D6(b). **(RO#2)**

Sub-step (b) has the operator ensure the CCW return from nuclear auxiliary components to Train A CCW is closed. **(RO#2)**

Step #D7 has the operator **locally** check if the ESW train B from CCW HX B valve is closed. **(RO#2)**

Step #D8, in the south electrical penetration room, has the operator place the boron injection upstream test line switch to iso/closed. **(RO#2)**

Steps #D9 and #D10 have the operator start the electrical penetration room cooler and isolate power to the thermal barrier CCW return bypass is valve on NBG02B. **(RO#2)**

Step #D11, has the operator inform the reactor operator that CCW alignment is completed. **(RO#2)**

Steps #D12 and #D13 have the operator open the ESW to/from containment isolation valves. **(RO#2)**

Step #D14 has the operator open the ESW to/from containment air cooler valves. **(RO#2)**

Step #D15 has the operator start containment cooler fans B and D. **(RO#2)**

Step #D16 has the operator place boron injection downstream test line switch to iso/closed in north electrical penetration room. **(RO#2)**

Steps #D17 and #D18, has the operator ensure the MSIVs are closed by unplugging the Amphenol connectors and then notify the SM at the aux shutdown panel of the status of the MSIVs. **(RO#2)**

Step #D19 requests the SM at the auxiliary shutdown panel to ensure S/G A and S/G C ARVs are closed. **(RO#2)**

Steps #D20 and #D21 have the operator isolate air and nitrogen to the S/G A and S/G C ARVs. **(RO#2)**

Step #D22, in the SGK04B room, has the operator start the Class 1E electrical equipment A/C unit. **(RO#2)**

Step #D23 has the operator proceed as directed by the SM at the ASP. **(RO#2)**

Attachment E: BN HV-8812A and Aux Feedwater Valve Closure

Step #E1 has the operator proceed to the NB02 switchgear room to obtain a copy of procedure OFN RP-017 and a flashlight. **(CRS)**

Step #E2 ensures motor driven AFW pump A is stopped. **(CRS)**

Step #E3 has the operator place the RWST to RHR pump A suction isolation valve breaker to off. **(CRS)**

Steps #E4 and #E5 have the operator, in RHR pump room A, close the RWST to RHR pump A isolation valve and then informs the SM that the valve is closed. **(CRS)**

Step #E6 has the operator ascend ladder to the 2000' elevation AFW pump room area. The operator then closes valves in the TDAFW valve room, the "B" aux feed pump valve room, and the SE room at the end of the corridor. **(CRS)**

Step #E7 has the operator notify Radiation Protection of the entry. (The operator has entered a non-RCA from an RCA). **(CRS)**

Step #E8 has the operator inform the SM that the AFW valves are closed. The operator proceeds back down the ladder and then to the ASP. **(CRS)**

Attachment F: Actions to Protect Train A Equipment – actions completed as operators become available **(NSO#3)**

Step #F1 has either **RO#1 or an extra NSO** go to diesel room A, ensure the master transfer switch is set to local/manual, and that Diesel A is stopped. The operator also ensures selected breakers at NB01 are open.

Step #F2 has either the **operator performing aux building actions or an extra NSO locally** open PB031 to NCP and **locally** stop containment coolers A and C.

Step #F3 has either **RO#1 or an NSO** ensure the Train A control room AC unit is stopped, the filtration fan is stopped and the train A class 1E ventilation unit is stopped,

Step #F4 dispatches **operators to ensure support equipment operation**; ensure the turbine lube oil pumps start as the turbine coasts down; ensures that the turbine is on the turning gear when the turbine speed approaches zero, and ensures the main feed pump(s) are on the turning gear when the main feed pump speed approaches zero.

Termination path (expected actions require TSC/E-Plan activation).

The longer-term closure to this event is assumed to involve a jump to procedure OFN RP-017A, "Hot Standby to Cold Shutdown from Outside the Control Room Due to Fire."

Take fire brigade actions in accordance with procedure AP 10-106, "Fire Preplans," Attachment B, "Control, Diesel and Communications Corridor Fire Preplans."

Analysis 12
Fire with Control Room Evacuation and Remote Shutdown
On-Shift Staffing Analysis Report
Revision 2

This On-Shift Analysis (OSA) is applicable to Analysis #12 identified in Appendix A **(Fire with Control Room Evacuation and Remote Shutdown).**

Analysis #12

TABLE 1 – On-shift Positions

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
1	Shift Manager (SM)	Radiological Emergency Response Plan, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L1 T2/L3 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L8 T5/L10	No	No
2	Work Control SRO (WCSRO)	Radiological Emergency Response Plan, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L12 T5/L6 T5/L9 T5/L11 T5/L13 T5/L14 T5/L15	No	Yes
3	Control Room Supervisor (CRS)	Radiological Emergency Response Plan, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L2	No	No

Analysis #12

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
4	Reactor Operator #1 (RO#1)	Radiological Emergency Response Plan, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum	NA	T2/L4	No	No
5	Reactor Operator #2 (RO#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L5	No	No
6	Nuclear Station Operator # 3 (NSO#3)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L6	No	No
7	Nuclear Station Operator # 4 (NSO#4)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L7 T3/L1	No	No
8	Nuclear Station Operator #5 (NSO#5)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L8 T3/L2	No	No
9	Nuclear Station Operator #6 (NSO#6)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L9 T3/L3	No	No
10	Nuclear Station Operator #7 (NSO#7)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L10 T3/L4	No	No

Analysis #12

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	TMS Required?
11	Nuclear Station Operator #8 (NSO#8)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	NA	T2/L11 T3/L5	No	No
12	Chemistry Technician (CH)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L5 T4/L6	No	No
13	Radiation Protection Technician #1 (RP#1)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	T4/L4	No	No
14	Radiation Protection Technician #2 (RP#2)	RERP, Figure 2, "Minimum Shift Staffing" & Attachment D, "WCGS Minimum Staffing for Emergencies"	90	NA	No	No
15	Security	RERP, Attachment D, "WCGS Minimum Staffing for Emergencies"	N/A	T5/L15	No	No

* Operations Fire Brigade – dedicated to fighting CR fire

Note: Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, OR the functions are the same, OR the functions are performed sequentially without issue.

TABLE 2 – Plant Operations & Safe Shutdown Analysis #12

One Unit - One Control Room

Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Operations Training
2	Unit Supervisor	Control Room Supervisor	Operations Training
3	Shift Technical Advisor	Shift Manager	Operations Training
4	Reactor Operator #1	Reactor Operator #1	Operations Training
5	Reactor Operator #2	Reactor Operator #2	Operations Training
6	Auxiliary Operator #3	Nuclear Station Operator #3 (OFN KC-016 Duty Person)	Operations Training
7	Auxiliary Operator #4	Nuclear Station Operator #4 (FBL)	Operations Training
8	Auxiliary Operator #5	Nuclear Station Operator #5 (Aux)	Operations Training
9	Auxiliary Operator #6	Nuclear Station Operator #6 (TB)	Operations Training
10	Auxiliary Operator #7	Nuclear Station Operator #7	Operations Training
11	Auxiliary Operator #8	Nuclear Station Operator #8	Operations Training
12	Work Control SRO	Work Control SRO (WCSRO)	Operations Training

Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable

Line	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
12	Mechanic	N/A	N/A
13	Electrician	N/A	N/A
14	I&C Technician	N/A	N/A
15	Other	N/A	N/A

TABLE 3 – Firefighting Analysis #12

Line	Performed By*	Task Analysis Controlling Method
1	Nuclear Station Operator #4 (Fire Brigade Leader)	Fire Program Training
2	Nuclear Station Operator #5 (Fire Brigade Member)	Fire Program Training
3	Nuclear Station Operator #6 (Fire Brigade Member)	Fire Program Training
4	Nuclear Station Operator #7 (Fire Brigade Member)	Fire Program Training
5	Nuclear Station Operator #8 (Fire Brigade Member)	Fire Program Training

*OFN KC-016 Operator required for Appendix R commitments (License Amendment #191 12/16/2012) and cannot be assigned other functions (TRM 5.2.1 and AP 21-001, Att. L, Note 4).

TABLE 4 – Radiation Protection & Chemistry

Analysis #12

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey On-Shift Position:	N/A – The performance of an in-plant survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure.																	
2	On-Site Survey On-Shift Position:	N/A – The performance of an on-site survey is not necessary for initial implementation of the Emergency Plan and not required by any procedure.																	
3	Personnel Monitoring On-Shift Position:	N/A – Personnel can out-process from the Radiologically Controlled Area (RCA) using portal and small article monitors. If necessary, site evacuees would be monitored after arrival of augmented ERO personnel.																	
4	Job Coverage On-Shift Position: RP Tech #2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Radiological Assessment* On-Shift Position: Chemistry Technician	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Chemistry function/task #1 – Sampling On-Shift Position: Chemistry Technician	N/A – No sampling required until the Technical Support Center is staffed per AP 15C-003.																	

*Dose assessment passes directly to the EOF, so this function is relieved at 90 minutes
RP Techs will perform the above tasks as directed and prioritized by the Shift Manager. There are no time critical RP tasks. The time to perform the tasks and the time to complete the tasks are estimated.

TABLE 5 – Emergency Plan Implementation Analysis #12

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the Emergency Classification Level (ECL)	Shift Manager	Operations Training and EP Training/Drill Program
2	Approve Offsite Protective Action Recommendations	Shift Manager	Operations Training and EP Training/Drill Program
3	Approve content of State/local notifications	Shift Manager	Operations Training and EP Training/Drill Program
4	Approve extension to allowable dose limits	Shift Manager	Operations Training and EP Training/Drill Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Operations Training and EP Training/Drill Program
6	ERO notification	Work Control SRO	Operations Training and EP Training/Drill Program
7	Abbreviated NRC notification for DBT event	N/A for this event	N/A
8	Complete State/local notification form	Shift Manager	Operations Training and EP Training/Drill Program
9	Perform State/local notifications	Work Control SRO	Operations Training and EP Training/Drill Program
10	Complete NRC event notification form	Shift Manager	Operations Training and EP Training/Drill Program
11	Activate ERDS	Work Control SRO	Operations Training and EP Training/Drill Program
12	Offsite radiological assessment	N/A – Table 4 – Chemistry Technician	Chemistry Training and EP Training/Drill Program
13	Perform NRC notifications	Work Control SRO	Operations Training and EP Training/Drill Program
14	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	Work Control SRO	Operations Training and EP Training/Drill Program
15	Personnel accountability	Security, Work Control SRO	Security Training and EP Training/Drill Program

APPENDIX C
Time Motion Study

Function / Responsibility (Task) Analysis Template

Event: All Events **Position: Work Control SRO (WCSRO)** **Line #: T1/L2**

Function	Responsibility (Task)	Action Step	Duration
1. Plant Operations	1.1 Upon a Reactor Trip or Sequencer Actuation support Plant Operations (status monitoring and EOP actions) not to interfere with Emergency Planning responsibilities.	1.1.1 Validate proper actuation of the Emergency Load Sequencer.	1 minute
		1.1.2 Validate Critical Safety Function Status Trees using EMG F-0.	3 minutes 15 seconds
2. Notification	2.1 Local/State Event Notification	2.1.1 Work Control SRO (WCSRO) independently evaluates the required classification.	1 minute 25 seconds
		2.1.2 Shift Manager classifies the event.	1 minute 15 seconds
		2.1.3 WCSRO fills out notification form.	2 minutes 45 seconds
		2.1.4 SM approves the notification form.	1 minute 45 seconds
		2.1.5 WCSRO contacts State to transmit information.	2 minutes 20 seconds
		2.1.6 WCSRO contacts County to transmit information.	1 minute 15 seconds
	2.2 NRC Event Notification	2.2.1 WCSRO contacts NRC Resident Inspector and informs of event.	1 minute
		2.2.1 WCSRO contacts NRC Operations Center, informs of event and maintains an open line with headset.	1 minute
		2.2.3 WCSRO activates ERDS from NPIS (the plant computer).	1 minute
	2.3 ERO Notification	2.3.1 WCSRO activates the Automatic Dialing System.	1 minute 55 seconds
	2.5 Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	2.5.1 WCSRO makes announcement for site evacuation.	2 minutes
		2.5.2 WCSRO contacts security for accountability.	1 minute
		2.5.3 WCSRO faxes the notification form to the TSC.	1 minute
		2.5.4 WCSRO contacts American Nuclear Insurers to inform of event.	1 minute
		2.5.5 WCSRO contacts INPO and inform of event.	1 minute
		2.5.6 WCSRO contacts Westar Generation Operations to inform of event.	1 minute

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APPENDIX D
On-Shift Staffing Analysis Documents

Analysis # __All___

Event	Title/Function/Task	Governing Procedure	Training Material
TABLE 2 – Plant Operations & Safe Shutdown			
1	Design Basis Threat	OFN SK-039, Security Events Security Procedures (Safeguards) OFN KJ-032, Local Emergency Diesel Startup EMG E-0, Reactor Trip or Safety Injection EMG ES-02, Reactor Trip Response (Station Operators)	LO1732447, OFN 00-036; OFN SK-039; and OFN SK-043 LO 1733210, Security LR1002005, OFN SK-039 Tabletop LR2471101, Security Event Workbook LO1706401, OFN KJ-032, Local Emergency Diesel Startup LO1732312, Intro to EMG Usage & Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume & Background Issues LR0032303, EMG E-0 Series OJT/TPE – NO 64-000-00 Auxiliary Building Completion Guide LO1732315, EMG ES-02 – Reactor Trip Response LO4710529, Reactor Trip Response LR0032303, EMG E-0 Series NO1251300, Site Watch OFN EMG Local Actions NO1350000, Turbine Building EMG and OFN Actions NO1351300, Turbine Building Watchstation OFN/EMG Local Actions NO1450001, EMG/OFN Actions – Auxiliary Building NO1451300, Auxiliary Building Watchstation OFN/EMG Local Actions NO4310500, NSO Sim Obs. (OFN/EMG Usage) NR1350000, EMG/OFN Walkdown – Turbine Building NR1632301, OFN/EMG Local Actions Walkdown

Analysis # __All___

Event	Title/Function/Task	Governing Procedure	Training Material
2	Steam system piping failure (major)	EMG E-0, Reactor Trip or Safety Injection	LO1732312, Introduction to EMG Usage and Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR 0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume and Background Issues LR 0032303, EMG E-0 Series
		EMG E-1, Loss of Reactor or Secondary Coolant	LO1732320, EMG E-1; Loss of Reactor or Secondary Coolant LR1400201, E-1 and Recovery Procedures
		EMG E-2, Faulted Steam Generator Isolation	LO1732324, EMG E-2; Faulted Steam Generator Isolation LO4710553, Faulted S/G LR0032305, EMG E-2 Bases Faulted SG Isolation
		EMG ES-11, Post-LOCA Cooldown and Depressurization	LO1732321, EMG ES-11; Post LOCA Cooldown and Depressurization LO4710552, LOCA with Cooldown/Depressurization and Recirc LR1400201, E-1 and Recovery Procedures
		EMG F-0, Critical Safety Function Status Trees	LO1732338, EMG F-0; Critical Safety Function Status Trees (CSFSTS) LO1732339, EMG FR-S1/S2; Loss of Subcriticality
		EMG FR-S1, Response to Nuclear Power Generation/ATWTS	NO1221804, Miscellaneous Site Diesel Generators OJT/TPE NO 62-000-00, Site Operator Completion Guide
		STN KAT-001, Technical Support Diesel Generator Operation (Station Operators)	NO1251300, Site Watch OFN EMG Local Actions NO1350000, Turbine Building EMG and OFN Actions NO1351300, Turbine Building Watchstation OFN/EMG Local Actions NO1450001, EMG/OFN Actions – Auxiliary Building NO1451300, Auxiliary Building Watchstation OFN/EMG Local Actions NO40310500 NSO Simulator Observation (OFN/EMG Usage) NR1350000, EMG/OFN Walkdown – Turbine Building NR1632301, OFN/EMG Local Actions Walkdown

Analysis # __All___

Event	Title/Function/Task	Governing Procedure	Training Material
3	Feed-water system piping break	EMG E-0, Reactor Trip or Safety Injection	LO1732312, Introduction to EMG Usage and Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR 0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume and Background Issues LR 0032303, EMG E-0 Series
		EMG E-1, Loss of Reactor or Secondary Coolant	LO1732320, EMG E-1; Loss of Reactor or Secondary Coolant LR1400201, E-1 and Recovery Procedures
		EMG E-2, Faulted Steam Generator Isolation	LO1732324, EMG E-2; Faulted Steam Generator Isolation LO4710553, Faulted S/G LR0032303, EMG E-0 Series
		EMG ES-03, SI Termination	LO4710528, Safety Injection Recovery and Termination LO1732316, EMG ES-03 SI Termination LR0032303, EMG E-0 Series
		(Station Operators)	NO1251300, Site Watch OFN EMG Local Actions NO1350000, Turbine Building EMG and OFN Actions NO1351300, Turbine Building Watchstation OFN/EMG Local Actions NO1450001, EMG/OFN Actions – Auxiliary Building NO1451300, Auxiliary Building Watchstation OFN/EMG Local Actions NO40310500 NSO Simulator Observation (OFN/EMG Usage) NR1350000, EMG/OFN Walkdown – Turbine Building NR1632301, OFN/EMG Local Actions Walkdown

Analysis # __All___

Event	Title/Function/Task	Governing Procedure	Training Material
4	Reactor coolant pump shaft seizure (locked rotor)	EMG E-0, Reactor Trip or Safety Injection EMG ES-03, SI Termination EMG F-0, Critical Safety Function Status Trees SYS KJ-121, Diesel Generator NE01 and NE02 Lineup for Automatic Operation (Station Operators)	LO1732312, Introduction to EMG Usage and Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR 0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume and Background Issues LR 0032303, EMG E-0 Series LO4710528, Safety Injection Recovery and Termination LO1732316, EMG ES-03 SI Termination LR0032303, EMG E-0 Series LO1732338, EMG F-0; Critical Safety Function Status Trees (CSFSTS) OJT/TPE NO 63-000-00 Turbine Building Completion Guide NO1251300, Site Watch OFN EMG Local Actions NO1350000, Turbine Building EMG and OFN Actions NO1351300, Turbine Building Watchstation OFN/EMG Local Actions NO1450001, EMG/OFN Actions – Auxiliary Building NO1451300, Auxiliary Building Watchstation OFN/EMG Local Actions NO40310500 NSO Simulator Observation (OFN/EMG Usage) NR1350000, EMG/OFN Walkdown – Turbine Building NR1632301, OFN/EMG Local Actions Walkdown
5	Reactor coolant pump shaft break	Bounded by event #4 above	Bounded by event #4 above

Analysis # __All___

Event	Title/Function/Task	Governing Procedure	Training Material
6	Spectrum of rod cluster control assembly ejection accidents	EMG E-0, Reactor Trip or Safety Injection	LO1732312, Introduction to EMG Usage and Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume and Background Issues LR0032303, EMG E-0 Series
		EMG ES-03, SI Termination	LO4710528, Safety Injection Recovery and Termination LO1732316, EMG ES-03 SI Termination LR0032303, EMG E-0 Series
		EMG ES-11, Post-LOCA Cooldown and Depressurization	LO1732321, EMG ES-11; Post LOCA Cooldown and Depressurization LO4710552, LOCA with Cooldown/Depressurization and Recirc LR1400201, E-1 and Recovery Procedures
		EMG ES-12, Transfer to Cold Leg Recirculation	LO1732322, EMG ES-12; Transfer to Cold Leg Recirculation LR1400201, E-1 and Recovery Procedures LO4710552, LOCA with Cooldown/Depressurization and Recirc
		EMG F-0, Critical Safety Function Status Trees	LO1732338, EMG F-0; Critical Safety Function Status Trees (CSFSTS)
		EMG FR-C3, Response to Saturated Core Conditions	LO1732341, EMG FR-C1/C2/C3 Inadequate/Degraded/Saturated Core Conditions LR1432304, EMG FR-C (Core Cooling) Series Procedures
		SYS KJ-121, Diesel Generator NE01 and NE02 Lineup for Automatic Operation (Station Operators)	OJT/TPE NO 63-000-00 Turbine Building Completion Guide NO1251300, Site Watch OFN EMG Local Actions NO1350000, Turbine Building EMG and OFN Actions NO1351300, Turbine Building Watchstation OFN/EMG Local Actions NO1450001, EMG/OFN Actions – Auxiliary Building NO1451300, Auxiliary Building Watchstation OFN/EMG Local Actions NO4310500 NSO Simulator Observation (OFN/EMG Usage) NR1350000, EMG/OFN Walkdown – Turbine Building

Analysis # __All___

Event	Title/Function/Task	Governing Procedure	Training Material
7	Steam generator tube failure	EMG E-0, Reactor Trip or Safety Injection	LO1732312, Introduction to EMG Usage and Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR 0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume and Background Issues LR0032303, EMG E-0 Series
		EMG C-31, STGR with Loss of Reactor Coolant – Subcooled Recovery Desired	LO1732335, EMG C-31/32/33: SGTR Contingency Procedures
		EMG E-2, Faulted Steam Generator Isolation	LO1732324, EMG E-2; Faulted Steam Generator Isolation LO4710553, Faulted S/G LR0032305, EMG E-2 Bases Faulted SG Isolation
		EMG E-3, Steam Generator Tube Rupture	LO1732325, EMG E-3; Steam Generator Tube Rupture LO4710501, Introduction to Steam Generator Tube Rupture LR4403502, EMG E-3 changes and practice
		EMG F-0, Critical Safety Function Status Trees	LO1732338, EMG F-0; Critical Safety Function Status Trees (CSFSTS)
		STN KAT-001, Technical Support Diesel Generator Operation	OJT/TPE NO 62-000-00 Site Operator Completion Guide
		(Station Operators)	NO1251300, Site Watch OFN EMG Local Actions NO1350000, Turbine Building EMG and OFN Actions NO1351300, Turbine Building Watchstation OFN/EMG Local Actions NO1450001, EMG/OFN Actions – Auxiliary Building NO1451300, Auxiliary Building Watchstation OFN/EMG Local Actions NO4310500 NSO Simulator Observation (OFN/EMG Usage) NR1350000, EMG/OFN Walkdown – Turbine Building NR1632301, OFN/EMG Local Actions Walkdown

Analysis # __All___

Event	Title/Function/Task	Governing Procedure	Training Material
8	Loss of coolant accidents (large break)	EMG E-0, Reactor Trip or Safety Injection EMG E-1, Loss of Reactor or Secondary Coolant EMG ES-12, Transfer to Cold Leg Recirculation EMG F-0, Critical Safety Function Status Trees STN KAT-001, Technical Support Diesel Generator Operation (Station Operators)	LO1732312, Introduction to EMG Usage and Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR 0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume and Background Issues LR 0032303, EMG E-0 Series LO1732320, EMG E-1; Loss of Reactor or Secondary Coolant LR1400201, E-1 and Recovery Procedures LO1732322, EMG ES-12; Transfer to Cold Leg Recirculation LO4710552, LOCA with Cooldown/Depressurization and Recirc LR1400201, E-1 and Recovery Procedures LO1732338, EMG F-0; Critical Safety Function Status Trees (CSFSTS) OJT/TPE NO 62-000-00 Site Operator Completion Guide NO1221804, Miscellaneous Site Diesel Generators NO1251300, Site Watch OFN EMG Local Actions NO1350000, Turbine Building EMG and OFN Actions NO1351300, Turbine Building Watchstation OFN/EMG Local Actions NO1450001, EMG/OFN Actions – Auxiliary Building NO1451300, Auxiliary Building Watchstation OFN/EMG Local Actions NO4310500 NSO Simulator Observation (OFN/EMG Usage) NR1350000, EMG/OFN Walkdown – Turbine Building NR1632301, ORN/EMG Local Actions Walkdown
9	Design basis fuel handling accident	OFN KE-018, Fuel Handling Accident	LO1732428, Fuel Handling Accident

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Event	Title/Function/Task	Governing Procedure	Training Material
10	Aircraft probable threat	OFN SK-039, Security Events Security Procedures (Safeguards) OFN MA-038, Rapid Plant Shutdown SYS AC-322, MSR 2nd Stage Reheat Operations EMG E-0, Critical Safety Function Status Trees (Station Operators)	LO1732447, OFN 00-036; OFN SK-039; and OFN SK-043 LO 1733210, Security LR1002005, OFN SK-039 Tabletop LR2471101, Security Event Workbook LO1732446, OFN MA-038: Rapid Plant Shutdown LO4710563, Rapid Plant Shutdown SY1503900, Main and Reheat Steam System LO1732312, Introduction to EMG Usage and Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR 0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume and Background Issues LR 0032303, EMG E-0 Series NO1251300, Site Watch OFN EMG Local Actions NO1350000, Turbine Building EMG and OFN Actions NO1351300, Turbine Building Watchstation OFN/EMG Local Actions NO1450001, EMG/OFN Actions – Auxiliary Building NO1451300, Auxiliary Building Watchstation OFN/EMG Local Actions NO4310500 NSO Simulator Observation (OFN/EMG Usage) NR1350000, EMG/OFN Walkdown – Turbine Building NR1632301, OFN/EMG Local Actions Walkdown

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Event	Title/Function/Task	Governing Procedure	Training Material
11	Station Blackout	EMG C-0, Loss of All AC Power	LO4710555, Loss of All AC Power and Recovery LO1732329, EMG C-0; Loss of All AC Power OP3310501, Loss of all AC Power Local Actions JITT LR5002013, Loss of All AC LR1029804, C-0 Procedures
		EMG E-0, Reactor Trip or Safety Injection	LO1732312, Introduction to EMG Usage and Executive Volume LO1732313, EMG E-0; Reactor Trip or Safety Injection (and Bases) LR 0032300, EMG/OFN Overview and Bases LR0032302, EMG Executive Volume and Background Issues LR0032303, EMG E-0 Series
		OFN KJ-032, Local Emergency Diesel Startup	LO1706401, OFN KJ-032, Local Emergency Diesel Startup
		OFN NB-030, Loss of AC Emergency Bus NB01(NB02)	LO4710562, Loss of Bus NB01(NB02) LO1732444, OFN NB-030 – Loss of NB01(NB02)/OFN NB-042 – Loop with EDG Paralleled
		STN KAT-001, Technical Support Diesel Generator Operation	NO1221804, Miscellaneous Site Diesel Generators OJT/TPE NO 62-000-00 Site Operator Completion Guide
		SYS SY-120, Sharpe Diesel Operation and Alignment to Site	NO1206202, Sharpe Substation Diesel Generator OJT/TPE NO 62-000-00 Site Operator Completion Guide
12	Fire with control room evacuation and remote shutdown	OFN RP-017, Control Room Evacuation	LO1732427, OFN RP-017 Control Room Evacuation LO4710541, Auxiliary Shutdown Panel Operation LR5002020, OFN RP-017 SRO/SO Actions
		(Station Operators)	NO1351300, Turbine Watchstation OFN/EMG Local Actions NO1451300, Auxiliary Watchstation OFN/EMG Local Actions
13	Severe accident management guidance	Bounded by events #7 & #8 above	Bounded by events #7 & #8 above

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Event	Title/Function/Task	Governing Procedure	Training Material
14	Appendix R fire response	Bounded by event #12 above	Bounded by event #12 above
Table 2 – Plant Operations & Safe Shutdown			
All	Shift Manager (SM)	AI 17C-005, Shift Manager Selection, Initial Training and Continuing Training Program	Initial training for Shift Manager position includes Transient & Accident Analysis (Att. B, Step B24, AC-1), Emergency Operating Procedures (Att. B, Step B25, AC-2), and Emergency Planning (Att. B, Step B23, EP-1) tasks
All	Shift Technical Advisor (STA)	AP 30B-003, Shift Technical Advisor Initial Training Program	Initial training for STA position includes Transient & Accident Analysis, Emergency Operating Procedures, and Emergency Planning tasks
All	Licensed Operator (CRS/RO#1/RO#2)	AP 30B-005, Licensed Operator Initial Training Program	Initial training for Licensed Operator positions includes Transient & Accident Analysis, Emergency Operating Procedures, and Emergency Planning tasks
All	Station Operator (SO#1/SO#2/SO#3/SO#4)	AP 30B-008, Non-Licensed Operator (NLO) Initial Training Program	Initial training for Station Operator positions includes Emergency Operating Procedures, and Emergency Planning tasks
TABLE 3 – Firefighting			
All	Fire Brigade Leader	AP 10-105, Fire Protection Training and Drills AP 10-100, Fire Protection Program AP 10-106, Fire Preplans	FL1224000, Fire Brigade Leader FB1231427, Fire Brigade Leader Member Incident Management FB1231423, Fire Control Part 1 of 2 Requalification FB1231426, Fire Control Part 2 of 2 Requalification FB1231424, Industry Specific Fire Hazards and Fire Control Methods

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All	Fire Brigade Member	AP 10-105, Fire Protection Training and Drills AP 10-100, Fire Protection Program AP 10-106, Fire Preplans	FB1231400, Initial Fire Brigade Member FB1231427, Fire Brigade Leader Member Incident Management FB1231423, Fire Control Part 1 of 2 Requalification FB1231426, Fire Control Part 2 of 2 Requalification FB1231424, Industry Specific Fire Hazards and Fire Control Methods;

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Event	Title/Function/Task	Governing Procedure	Training Material
TABLE 4 – Radiation Protection & Chemistry			
All	Chemistry Technician	EPP 06-001, Control Room Operations EPP 06-012, Dose Assessment AP 30D-006, Chemistry Technician Training Program	GE1135621, E-Plan for Chemistry Technicians CE1135620, NPIS for Dose Projection CE1235620, NPIS Review CE1135610, Emergency Dose Calculation Program (EDCP) CE1235610, Off-site Dose Projection Using EDCP Sampling and analysis covered in accredited initial and continuing Chemistry Training Program
All	RP Technician	EPP 06-001, Control Room Operations AP 30D-100, Health Physics Training Program	GE1135620, E-Plan for HP Technicians GE0135614, Survey Team Techniques Survey and monitoring covered in accredited initial and continuing Health Physics Training Program
TABLE 5 – Emergency Plan Implementation			
All	Declare the Emergency Classification Level (ECL)	EPP 06-001, Control Room Operations EPP 06-005, Emergency Classification	GE1135628, E-Plan for Licensed Control Room Personnel LO1733215, Emergency Classification and Protective Action Recommendations LR1007001, Emergency Classification and Protective Action Recommendations
All	Approve Offsite Protective Action Recommendations	EPP 06-001, Control Room Operations EPP 06-006, Protective Action Recommendations	GE1135628, E-Plan for Licensed Control Room Personnel LO1733215, Emergency Classification and Protective Action Recommendations LR1007001, Emergency Classification and Protective Action Recommendations
All	Approve content of State/local notifications	EPP 06-001, Control Room Operations EPP 06-007, Emergency Notifications	GE1135628, E-Plan for Licensed Control Room Personnel

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All	Approve extension to allowable dose limits	EPP 06-001, Control Room Operations EPP 06-013, Exposure Control and Personnel Protection	GE1135628, E-Plan for Licensed Control Room Personnel

Appendix D
On-Shift Staffing Analysis Report – Revision 2
On-Shift Staffing Analysis Documents

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Event	Title/Function/Task	Governing Procedure	Training Material
All	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	EPP 06-001, Control Room Operations EPP 06-010, Personnel Accountability and Evacuation	GE1135628, E-Plan for Licensed Control Room Personnel
All	ERO notification	EPP 06-001, Control Room Operations EPP 06-015, Emergency Response Organization Callout	GE1135628, E-Plan for Licensed Control Room Personnel GE1135619, E-Plan for Off-Site Communicators
All	Abbreviated NRC notification for DBT event	OFN SK-039, Security Event	LO1732447, OFN 00-036, OFN SK-039 and OFN SK-043 LO1733210, Security LR1002005, Security Procedure Review
All	Complete State/local notification form	EPP 06-001, Control Room Operations EPP 06-007, Emergency Notifications	GE1135628, E-Plan for Licensed Control Room Personnel GE1135619, E-Plan for Off-Site Communicators
All	Perform State/local notifications	EPP 06-001, Control Room Operations EPP 06-007, Emergency Notifications	GE1135628, E-Plan for Licensed Control Room Personnel GE1135619, E-Plan for Off-Site Communicators
All	Complete NRC event notification form	EPP 06-001, Control Room Operations EPP 06-007, Emergency Notifications	GE1135628, E-Plan for Licensed Control Room Personnel GE1135618, E-Plan for Control Room ENS Communicators
All	Activate ERDS	EPP 06-001, Control Room Operations	GE1135628, E-Plan for Licensed Control Room Personnel
All	Offsite radiological assessment	EPP 06-001, Control Room Operations EPP 06-012, Dose Assessment	GE1135628, E-Plan for Licensed Control Room Personnel GE1135621, E-Plan for the Chemistry Technician CE1135620, NPIS for Dose Assessment CE1235620, Nuclear Plant Information System (NPIS) Review CE1135610, Emergency Dose Calculation Program (EDCP) CE1235610, Off-Site Dose Projection Using EDCP

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Event	Title/Function/Task	Governing Procedure	Training Material
All	Perform NRC notifications	EPP 06-001, Control Room Operations EPP 06-007, Emergency Notifications	GE1135628, E-Plan for Licensed Control Room Personnel GE1135618, E-Plan for Control Room ENS Communicators
All	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	EPP 06-001, Control Room Operations EPP 06-007, Emergency Notifications	GE1135628, E-Plan for Licensed Control Room Personnel GE1135619, E-Plan for Off-Site Communicators
All	Personnel accountability	EPP 06-001, Control Room Operations EPP 06-010, Personnel Accountability and Evacuation	GE1135628, E-Plan for Licensed Control Room Personnel GE1135672, E-Plan for Security Coordinators