Bell Bend Nuclear Power Plant

Combined License Application

Part 5: Emergency Plan

Revision 1

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Revision History	
Revision 1	Incorporates LBDCR-09-0027, which revises the site-specific brackets in the Emergency Plan.

{BELL BEND NUCLEAR POWER PLANT}
EMERGENCY PLAN

{PPL Bell Bend, LLC}

Revision 1

Approved by ____ Date ____________
Senior Vice President, PPL Bell Bend

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LIST OF ANNEXES

The Unit Annexes subject to the requirements of this plan are as follows:

{Bell Bend Nuclear Power Plant} Emergency Plan Annex

Part I: Introduction

A: Purpose

As required in the conditions set forth by the Nuclear Regulatory Commission (NRC) for the operating license for the {Bell Bend Nuclear Power Plant (referred to as {BBNPP})} the {licensee}, {PPL Bell Bend, LLC)} recognizes their responsibility and authority to operate and maintain the nuclear power plant in such a manner as to provide for the safety of the general public. This document describes the {BBNPP} Emergency Preparedness Program. The philosophy that guides the development and maintenance of this program is the protection of the health and safety of the general public in the communities around the nuclear power plant(s) and the personnel who work at the plant.

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

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

In order to minimize the number of ad-hoc decisions made during an emergency and to ensure that necessary equipment, supplies, and essential services are available to meet the needs of an emergency, the Licensee has developed this Emergency Plan. This Emergency Plan is applicable to {BBNPP} and considers the consequences of radiological emergencies, as required by 10 CFR 50, Paragraph 50.47 and Appendix E.

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

This plan also addresses the requirements of the Commission Orders of February 25, 2002, relating to security events.

The Emergency Plan also considers the consequences of non-radiological emergencies.

The Unit Annex contains information and guidance that is unique to the U.S. EPR unit. The annex addresses unit-specific criteria, including:

- Unit Description
- Emergency Action Levels (EALs),
- Deviations from the E-Plan (such as unit specific on-shift staffing, unique aspects of Emergency Response Organization (ERO) augmentation, and so forth).

- Unit specific emergency response capabilities, such as specific equipment or facilities available for use by the ERO.

The Unit Annex becomes a part of the plan and is subject to the same review and audit requirements as the plan. In the areas where a Unit Annex deviates from the general requirements of the E-Plan, the Unit Annex shall serve as the controlling document.

Detailed E-Plan implementing procedures are maintained separately and are used to guide those responsible for implementing emergency actions.

B: Background

Facility Description

The {Bell Bend Nuclear Power Plant (BBNPP) is located west of the existing Susquehanna Steam Electric Station (SSES) in Salem Township, Luzerne County, Pennsylvania. The plant's Reactor Building is located at Latitude 41°05'12" N and Longitude 76°09'54" W. The site boundaries are delineated in Figure 1-1. The BBNPP site occupies an area of 882 acres (357 hectares). No commercial, industrial, residential, or recreational structures are located within the site area}.

The {BBNPP site approximately five mi (eight km) northeast of the borough of Berwick, Pennsylvania, and 1.5 mi (2.4 km) to the north and west of the north branch of the Susquehanna River at an approximate elevation of 850 ft (260m) above mean sea level. The site is situated on a rolling plateau in a rural area of open deciduous woodlands, interspersed with grasslands and orchards. The major metropolitan centers closest to the site include: Wilkes-Barre, which is approximately 20 mi (32 km) to the northeast; Allentown, PA, which is approximately 50 mi (80 km) to the southeast; and Harrisburg, PA, which is roughly 70 mi (110 km) to the southwest.}

{The site is accessed from US Route 11, which is located approximately 1 mi (0.6 km) to the south. US Route 11 travels approximately 10 mi (16 km) southwest from the site through Berwick to intersect with US Interstate Highway 80, and to the northeast of the site, continues to Wilkes-Barre, eventually connecting with US Interstate Highway 81.}

The E-Plan Annex provided a detailed description of the {BBNPP} plant.

Emergency Planning Zone

The plume exposure Emergency Planning Zone (EPZ) for {BBNPP} shall be an area surrounding the Site with a radius of about ten miles (16 kilometers). (Exact boundaries are determined in concurrence with {commonwealth} and local authorities). Refer to Figure 1-2.

The ingestion pathway EPZ for {BBNPP} shall be an area surrounding the Site with a radius of about 50 miles (80 kilometers). Refer to Figure 1-3.

Part I: Introduction

The primary hazard consideration at nuclear power plants is the potential unplanned release of radioactive material resulting from an accident. The probability of such a release is considered very low due to plant design and strict operational guidelines enforced by the NRC. Not withstanding, federal {and commonwealth} regulations require that a sound emergency preparedness program exist for each commercial nuclear power plant. A detailed description of the site is given in the Final Safety Analysis Report (FSAR).

C: Scope

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

D: Planning Basis

The E-Plan, in conjunction with the Unit Annex and implementing and administrative procedures, documents the methods by which the {BBNPP} Emergency Preparedness Program meets the planning standards set forth in 10 CFR 50.47(b) and the requirements of 10 CFR 50 Appendix E. Development of the E-Plan was based on NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."

Acceptable alternate methods, which deviate from NUREG-0654, are allowed under Regulatory Guide 1.101, “Emergency Planning and Preparedness for Nuclear Power Reactors.” However, deviations will be documented in the Unit Annex and evaluated as continuing to meet the Planning Standards of 10 CFR 50.47(b) and Appendix E to 10 CFR 50 under the 10 CFR 50.54(q) process to ensure the continued effectiveness of {BBNPP} E-Plan and Unit Annex.

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

E: Contiguous-Jurisdiction Emergency Planning

The E-Plan recognizes the {Commonwealth}, in cooperation with the local EPZ communities, as the overall authority responsible for protective action directives in order to protect the health and safety of the general public.

F: Integrated Guidance and Criteria

Federal, {Commonwealth} and local (county, city and/or town level) emergency response plans are developed in conjunction with this plan to ensure a consistent and integrated response to a classified event.

G: Funding and Technical Assistance

The Licensee is dedicated to providing the level of support necessary, as dictated by federal {and commonwealth} regulation, to ensure appropriate integration of the {commonwealth}, local, and licensee radiological emergency preparedness programs.

H: Emergency Response Organization

The Licensee acknowledges its primary responsibility for planning and implementing emergency measures within the site boundary and for overall plant accident assessment. These emergency measures include corrective actions, protective measures, and aid for personnel onsite. To accomplish these responsibilities, the Licensee has established an Emergency Response Organization (ERO) which will be mobilized to provide the initial response to an event. In addition advance arrangements have been made with offsite organizations for special emergency assistance such as ambulance, medical, hospital, fire, and police services.

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

I: Federal Response

Provisions are made within the E-Plan for the integration of appropriate elements of the federal assistance activities. Arrangements have been made to accommodate a federal response organization presence in the {BBNPP} emergency response facilities as well as support communications between licensee and federal emergency facilities. NRC response as described in NUREG-0728, Rev. 4, "NRC Incident Response Plan (IRP)", was used in the development of the E-Plan as guidance to ensure coordination between the {BBNPP} ERO and NRC EROs.

J: Form and Content of Plan

As required by federal regulations, the E-Plan is governed by and contained (or referenced) in the unit(s) FSAR. The E-Plan is administratively maintained as a separate document. The E-Plan has been formatted similar to NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." The use of this format lends itself to uncomplicated comparison with the criteria set forth in NUREG-0654/FEMA-REP-1.

Appendix 2, "Procedure Cross-Reference to NUREG-0654," provides a cross-reference between the NUREG-0654 evaluation criteria and the E-Plan implementing procedures and applicable administrative documents. Appendix 2 also references other regulatory guidance used in development of this plan.

Required Content of the Unit Annexes

Information that is in the plan need not be restated in the Annex. The Annex shall address unit specific details or any differences from main body of plan. Annexes may be used for co-located units of different designs or non-co-located units operated by the Licensee.

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

1. Section 1: Introduction

   The unit description and any surrounding area differences are described by the inclusion of maps, drawings and/or diagrams. A summary statement describes the Annex's interface with the Emergency Plan.

2. Section 2: Organizational Control of Emergencies

   Unit specific differences from the Emergency Plan, such as on-shift staffing or ERO augmentation, shall be outlined. Unit-specific position titles, corresponding to the position titles used in this Emergency Plan shall also be provided, if not standard across the site.

3. Section 3: Classification of Emergencies

   Unit specific EALs are included for all emergency classes for the purpose of event classification.

4. Section 4: Emergency Response Facilities and Equipment

   Unit specific emergency response facilities and equipment and instrumentation for emergency assessment are provided if not shared by all units at the site.

5. Section 5: Emergency Measures

   Unit specific assembly areas and egress routes are provided if not shared by all units at the site.

Additional section(s) may be added if additional areas are unit specific.

Figure 1-1, Map of Site and Surrounding Area

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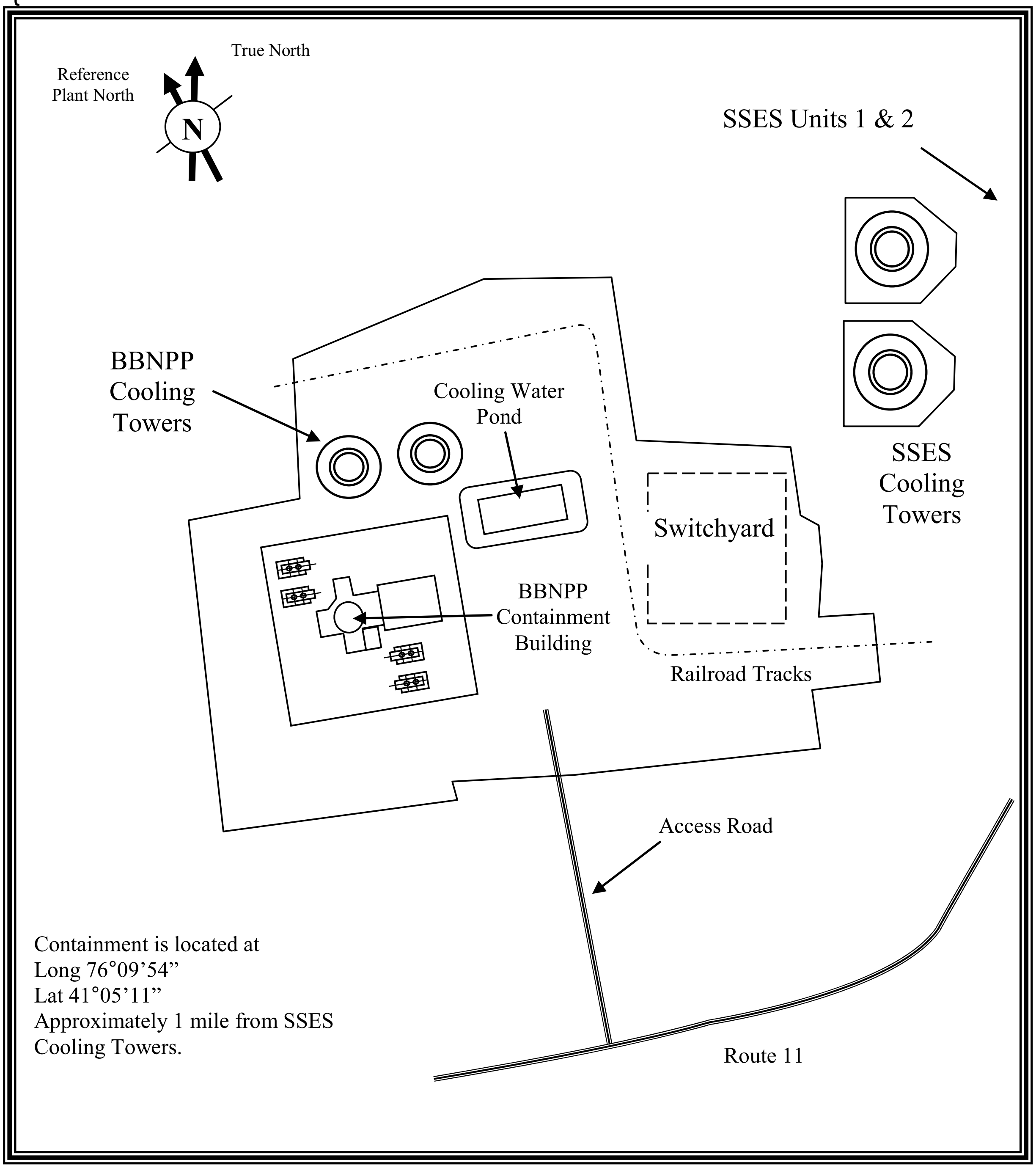

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Figure 1-2, 10-Mile (16 Kilometer) Emergency Planning Zone

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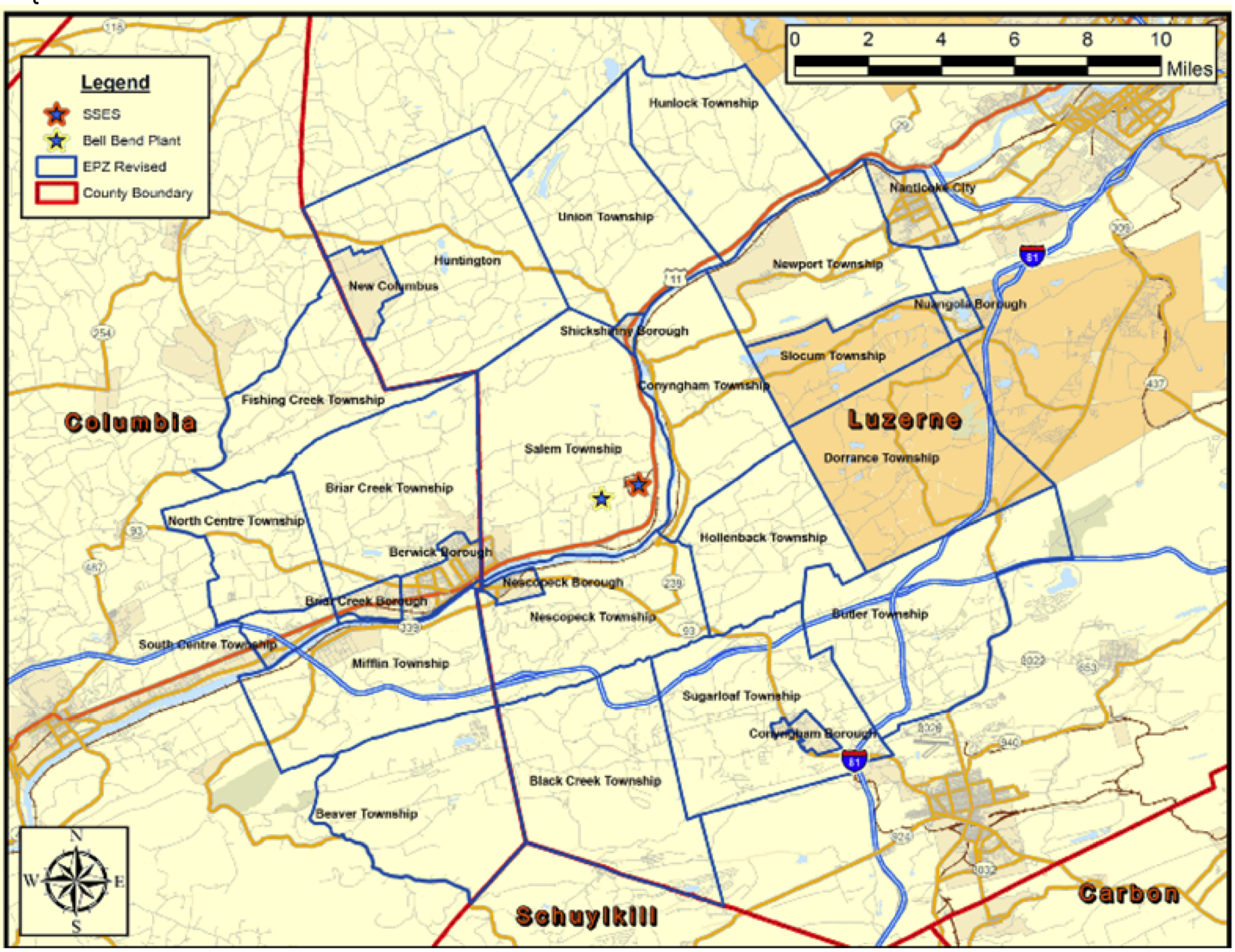

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Figure 1-3, 50-Mile (80 Kilometer) Emergency Planning Zone

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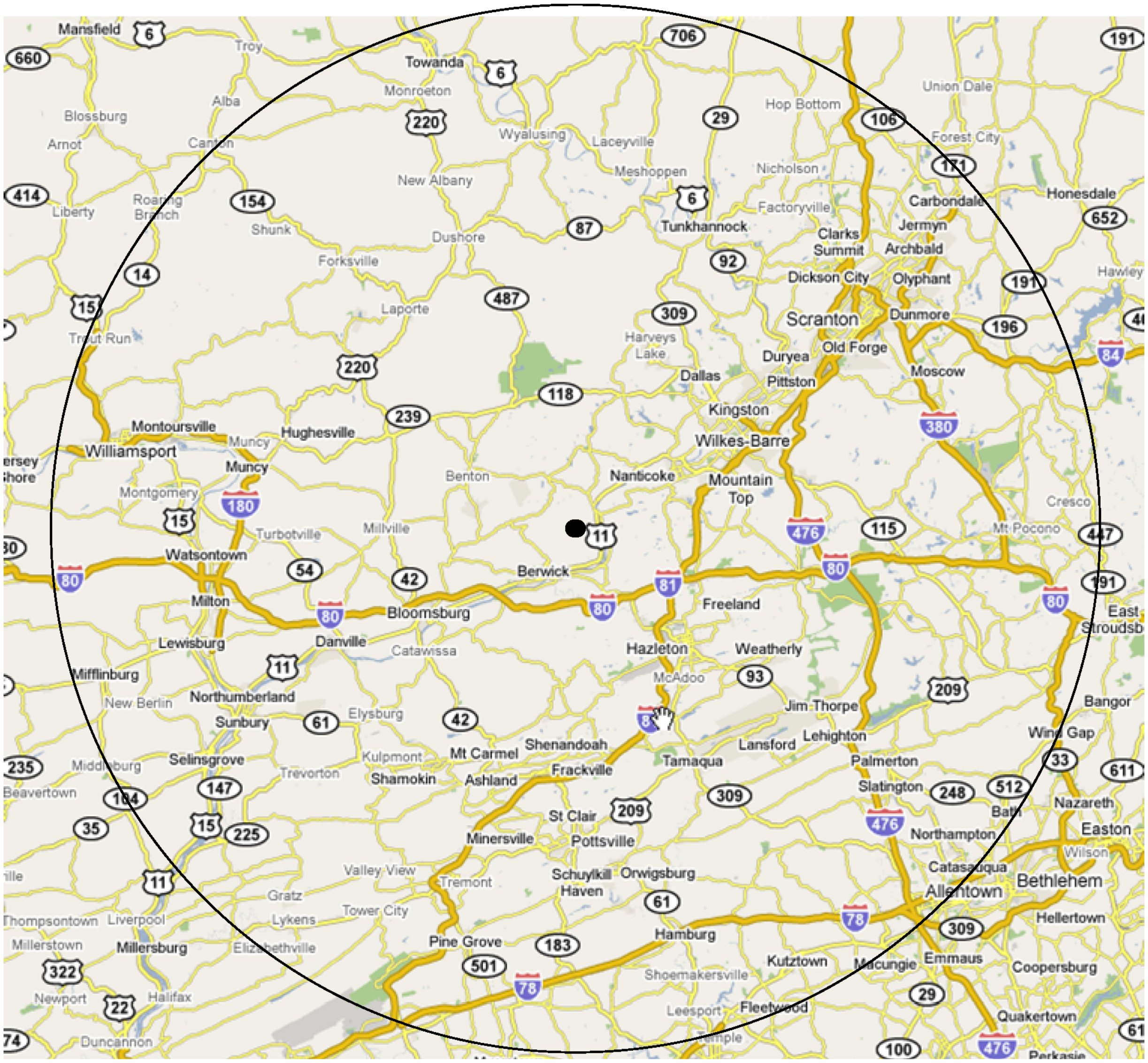

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Section A: Assignment of Responsibility

This section describes the primary responsibilities and organizational control of licensee, federal, {commonwealth}, local, and other emergency response organizations within the Plume Exposure Pathway and the Ingestion Pathway Emergency Planning Zones (EPZs). Various supporting organizations are also described as well as staffing for initial and continuous response.

1. Concept of Operations

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

a. Identified below are federal, {commonwealth}, and local organizations (and other local governmental agencies) that are involved in a response to an emergency at {BBNPP}.

1) Federal Agencies: The National Response Plan (NRP), Nuclear/Radiological Incident Annex outlines the statutory and regulatory responsibilities. The primary federal response for supporting an emergency at {BBNPP} includes:

a) Nuclear Regulatory Commission (NRC): The NRC is responsible for licensing and regulating nuclear facilities and materials and for conducting research in support of the licensing and regulatory process. These responsibilities include protecting the public health and safety, protecting the environment, protecting and safeguarding materials and plants in the interest of national security and assuring conformity with antitrust laws.

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

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

With regard to emergency preparedness, the NRC shall:

- Assess licensee emergency plans for adequacy;
- Review the Federal Emergency Management Agency (FEMA) findings and determinations on the adequacy and capability of implementation of {commonwealth} and local plans; and
- Make decisions with regard to the overall state of emergency preparedness and issuance of operating licenses.

The NRC shall respond to incidents at licensed facilities or vehicular accidents involving licensed materials, including radionuclides, in transit. The NRC shall act as the lead Federal agency with regard to technical matters during a nuclear incident including radiological assistance. The NRC shall be prepared to recommend appropriate protective actions for the public and technical actions to the licensee. FEMA shall act as the lead Federal agency for offsite, non-technical concerns.

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

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

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

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

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

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

The plan is intended to ensure NRC preparedness:

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

b) Department of Homeland Security (DHS): Per the National Response Plan (NRP), DHS is responsible for the overall coordination of a multi-agency Federal response to a significant radiological incident. The primary role of DHS is to support the {commonwealth} by coordinating the delivery of Federal non-technical assistance. DHS coordinates {commonwealth} requests for Federal assistance, identifying which Federal agency can best address specific needs. If deemed necessary by DHS, it will establish a Federal Response Center from which it will manage its assistance activities.

Federal Emergency Management Agency (FEMA): FEMA is the agency within DHS which provides direct support to {commonwealth} and local agencies in emergency response.

c) Federal Radiological Preparedness Coordinating Committee (FRPCC): The FRPCC consists of FEMA, which chairs the Committee, the Nuclear Regulatory Commission, the Environmental Protection Agency, the Department of Health and Human Services, the Department of Energy, the Department of Transportation, the Department of Defense, the Department of Agriculture, the Department of Commerce, and where appropriate and on an ad hoc basis, other Federal departments and agencies. The FRPCC shall assist FEMA in providing policy direction for the program of Federal assistance to state and local governments in their radiological emergency planning and preparedness activities.

d) U.S. Department of Energy (DOE): The Department of Energy (DOE) has extensive radiological monitoring equipment and personnel resources that it can assemble and dispatch to the scene of a radiological incident. The Department of Energy (DOE) local operations office can assist {BBNPP} following a radiological incident as outlined in the Federal Radiological Monitoring and Assessment Plan (FRMAP). If {BBNPP}, the NRC or the affected states deem that assistance from DOE is necessary or desirable, the affected state(s) would notify the appropriate DOE operations office.

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

f) The U.S. Coast Guard (USCG): The USCG patrols and ensures the safety of navigable waterways in the United States. The USCG is promptly notified of any oil or hazardous substance discharges into rivers or lakes or radioactive contamination of rivers or lakes under its jurisdiction at levels requiring assistance to effect protective actions. The USCG is contacted by the appropriate {commonwealth} agencies in the event of an incident at an applicable nuclear power plant. The USCG is responsible for officially closing the waterways to all commercial traffic. Refer to the {Pennsylvania Emergency Management Agency (PEMA) Emergency Plan, Annex E of {Commonwealth} Disaster Operations Plan, Nuclear Incidents (Fixed Facility).}

g) U.S. Army Corps of Engineers: The U.S. Army Corps of Engineers control barge and boat traffic at locks and dams on navigable waterways in the United States. The Corps of Engineers will be contacted by the appropriate {commonwealth} agencies in the event of an incident at an applicable nuclear power plant. The Corps will be responsible for closing their locks and dams to all waterway traffic leading to the affected area, allowing only traffic leaving the area. Refer to the appropriate sections of {PEMA Emergency Plan.}

h) Federal Bureau of Investigation (FBI): Support from the FBI is available through its statutory responsibility based in Public Law and the US code, and through a memorandum of understanding for cooperation with the NRC. Notification to the FBI of emergencies in which they would have an interest will be through provisions of the site's Nuclear Security Plan, or by the NRC.

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

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

2) {Commonwealth} Agencies

a) The {Commonwealth of Pennsylvania The Commonwealth of Pennsylvania has the statutory responsibility and authority for protecting the health and safety of the public in Pennsylvania. The commonwealth has developed the Pennsylvania Emergency Plan. This plan was developed in accordance with the guidance suggested by NUREG 0396 and NUREG 0654/FEMA-REP-1, Rev. 1. The Pennsylvania Plan has received 44 CFR 350 unconditional approvals from FEMA for the Susquehanna Steam Electric Station. Pennsylvania Radiological Emergency Plan, describes State and local agency roles and interfaces for carrying out protective and parallel actions in a 10-mile-radius plume zone and 50-mile-radius ingestion zone from BBNPP site. Basic descriptions for the Pennsylvania agencies responsible for actions during an event at a nuclear power plant are as follows:

- Governor of Pennsylvania: The Governor of the Commonwealth has overall command authority for both the radiological and non-radiological aspects of a nuclear incident. The Governor shall make the final recommendation for protective actions and shall serve as the commonwealth's primary spokesperson.

- Pennsylvania Emergency Management Agency (PEMA): Coordinates the operational response and recovery functions of all Commonwealth agencies. PEMA proposes a Protective Actions to the Governor. It also coordinates the implementation of the Governor's Protective Action Decisions (PADS).

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

  – Command for all (state related) radiological aspects of a nuclear incident.

- PEMA has the responsibility to inform the adjoining states Emergency Management Agencies with respect to an emergency that impacts the 50-mile (80-kilometer) Ingestion Pathway Zone.

- PEMA has the command authority for radiological aspects of a nuclear incident.

- For events that impact the BBNPP 50-mile (80-kilometer) ingestion pathway, PEMA will coordinate technical information with the other states which may be impacted.

• Department of Environmental Protection/Bureau of Radiological Protection (DEP / BRP) provides for:

  - Technical consultation on Radiological and Plant conditions.

  - Field radiological functions (state related) of confirmatory accident assessments during a nuclear emergency. This may include a Mobile Command Center and monitoring and sampling teams.

  - Performing various radiological functions. These functions include milk, water and food control, radiation exposure control for state emergency workers, and confirmatory accident assessment.

  - Accident assessment.

  - Recommendations for protective actions.

  - Recommendations for protection of potable water and food.

  - Recommendations for recovery and re-entry (off-site).

  - Operation of DEP/BRP EOC.}

b) Essential elements of the 50-Mile Plume Exposure emergency plans: Initially, responsibility for responding to a radiological emergency, including evacuation, rests with local governments and their emergency services. Notification, by either local authorities or legal possessors of uncontrolled materials, to the state EMA that a radiological emergency exists will bring in the resources of other state agencies to assess and evaluate the situation and determine protective actions. State agency notification for assistance and coordination of response operations of the state agencies in support of local government will be performed by the {DEP / BRP}.

3) {Local} Government Agencies

{BBNPP and the surrounding communities that comprise the Plume Exposure Pathway EPZs have developed integrated emergency response programs that call upon the resources of their community. The community organizations are responsible for implementing and coordinating the community response to an emergency.

{Portions of Luzerne and Columbia counties are within the 10 mile Emergency Planning Zone for BBNPP. Municipalities within the EPZ which participate in the planning effort are listed in their respective county emergency plans.

The Columbia County Department of Public Safety and Luzerne County Emergency Management Agency are responsible for planning and coordination with the utility, municipal, {Commonwealth} and Federal authorities in preparation for an emergency at BBNPP.

County actions during a declared emergency include:

- Initial response to notification by BBNPP.
- Alert and warning of local populations within the 10 mile EPZ.
- Evacuation and other protective measures for local populations within the 10 mile EPZ.
- Emergency services.
- Operation of county EOC.

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

b. During an emergency condition classified as an Alert, Site Area Emergency, or General Emergency, the Site's ERO replaces the normal plant organization. The ERO consists of three major response sub-organizations:

1) The Plant Organization, directed by the {Emergency Plant Manager} provides for:

- Control and operation of the plant.
- Mitigation of the emergency condition.
- Protection of site personnel.
- Emergency event classification.

- Notification of the appropriate individuals and agencies prior to EOF taking Command and Control.

- Emergency support for operations, engineering, maintenance, fire fighting, material acquisition, security, and first aid.

The Plant Organization is made up primarily of personnel from the sites day to day management team, Department Heads, Operations, Health Physics, Chemistry, Engineering, Maintenance, Security and other site support personnel.

2) The Offsite Organization, directed by the {Emergency Director} provides for:

- Emergency notifications to Federal, {commonwealth} and local agencies.

- Offsite radiological accident assessment and Protective Action Recommendations to offsite authorities.

- It serves as the primary interface between {BBNPP} and outside organizations responsible for the protection of the public.

- Obtaining offsite support for the plant organization needed to mitigate effects of event.

The Offsite Organization is made up primarily of personnel from the site and Corporate Management.

3) The Public Information Organization, directed by the {Company Spokesperson}, coordinates with public information officers from other organizations to provide information to the public through the news media.

c. Interrelationships between major Licensee organizations and sub-organizations in the total response effort are illustrated in a block diagram in Figures A-1 and A-2. For a more detailed diagram of the ERO, see Figures B-1a to B-1d.

d. The {Emergency Director} is a senior Licensee employee with overall responsibility for coordinating emergency response actions in support of the site, the Emergency Public Information Organization, and affected {commonwealth}(s) and local agencies. The senior operations person on shift serves as the {Interim Emergency Director} until relieved by the {Emergency Plant Manager} or the on call {Emergency Director}.

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

2. {Commonwealth} and County Functions and Responsibilities

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

3. Agreements in Planning Effort

Written agreements establishing the concept of operations developed between the Licensee and other support organizations having an emergency response role within the EPZs have been developed. These agreements identify the emergency measures to be provided, the mutually accepted criteria for implementation, and the arrangements for exchange of information. Agreement letters are not necessary with Federal Agencies who are legally required to respond based on Federal law; however, agreements are necessary if the agency was expected to provide assistance not required by law. Letters of Agreement with private contractors and others who provide services in support the site shall be obtained. Letters of Agreement is provided in Appendix 3 of this E-Plan. Letters of Agreement, as a minimum, state that the cooperating organization will provide their normal services in support of an emergency at the affected site. A contract/purchase order with a private contractor is considered acceptable in lieu of a Letter of Agreement for the specified duration of the contract.

In addition to the specific agreements listed in Appendix 3, general agreements between members of the nuclear industry and government agencies exist. These agreements are used to coordinate emergency response efforts for a major event.

4. Continuous Coverage

{BBNPP} maintains a 24-hour emergency response capability. The normal on-shift complement provides the initial response to an emergency. This group is trained to handle emergency situations (e.g. initiate implementation of the E-Plan, make initial accident assessment, emergency classification, notifications, communications, and protective action recommendations) until the augmented ERO arrives. The ERO is composed of a broad spectrum of personnel with specialties in operations, maintenance, engineering, radiochemistry, health physics, material control, fire protection, security, and emergency planning and are available and trained to augment on-shift personnel in an emergency. Procedures for training and maintenance of the emergency organization are in place to provide the capability of continuous (24-hour) operations.

The {Emergency Director}, located in the EOF, has the authority and responsibility for assuring continuity of resources (technical, administrative, and material) in the event of the activation of the ERO.

Figure A-1: Licensee Emergency Response Organization Interrelationships

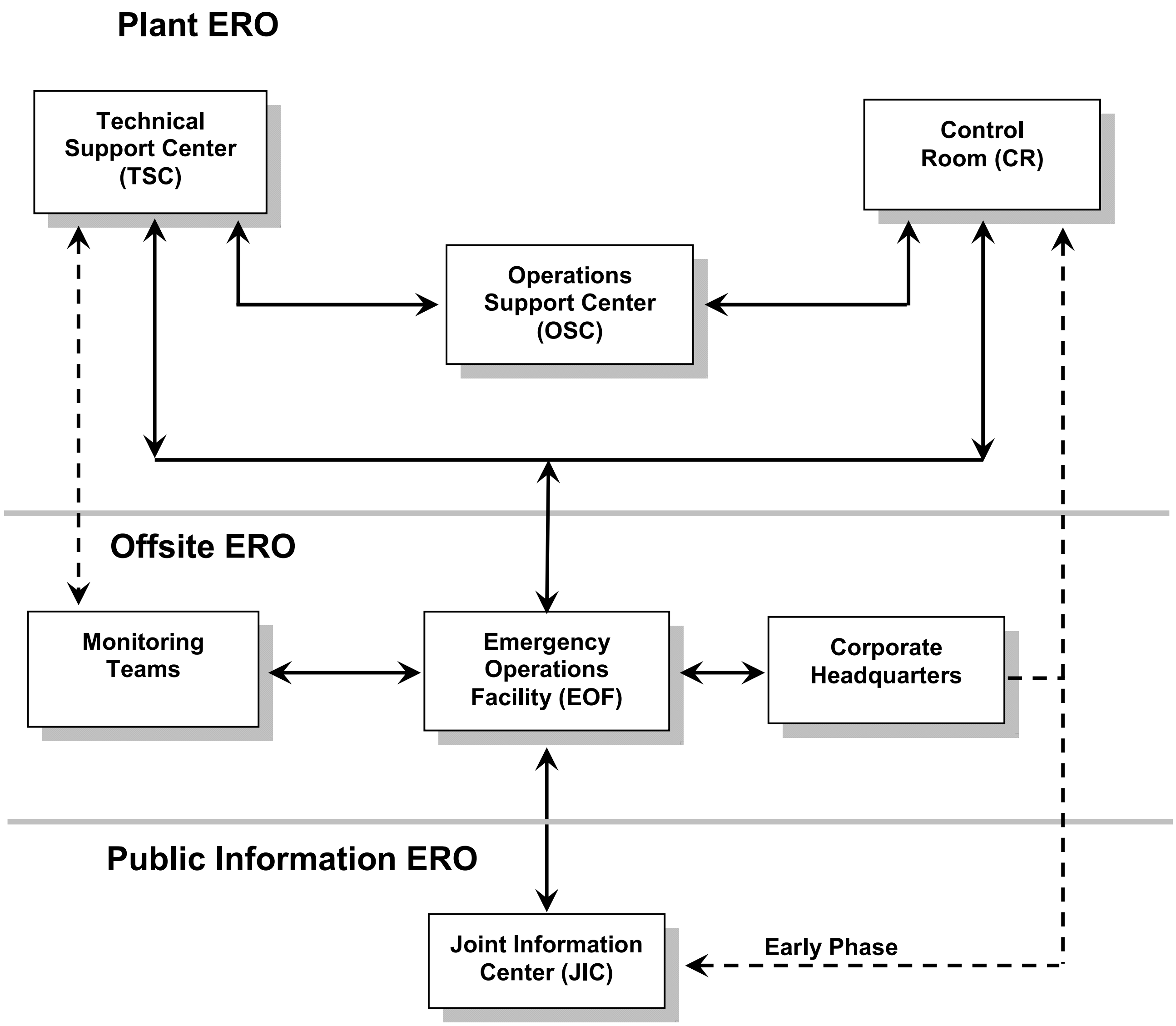

Figure A-2: Agency Response Organization Interrelationships

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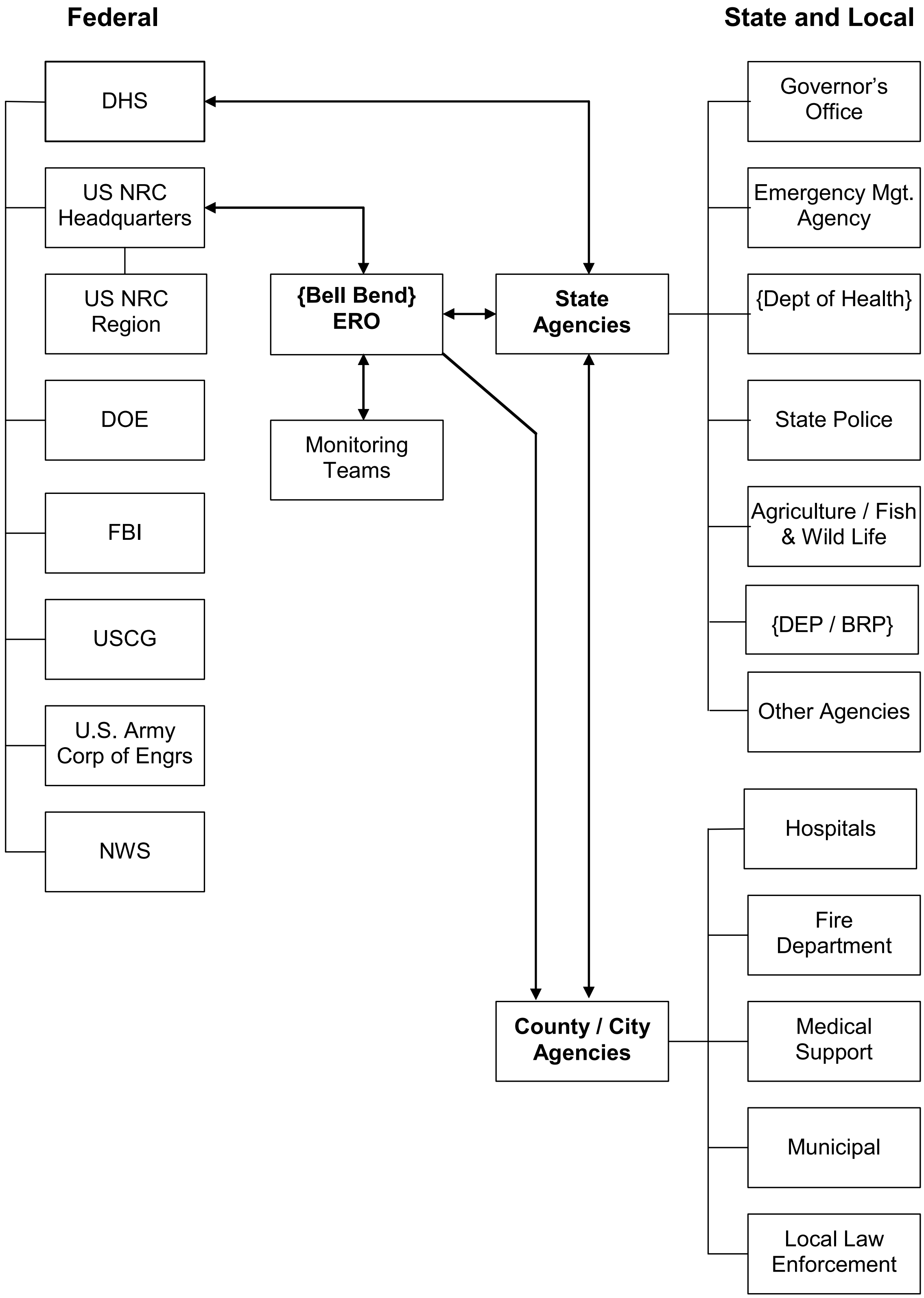

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Section B: Emergency Response Organization

This section describes the {BBNPP} Emergency Response Organization (ERO), its key positions and associated responsibilities. It outlines the staffing requirements which provide initial emergency response actions and provisions for timely augmentation of on-shift personnel when required. It also describes interfaces among {BBNPP} emergency response personnel and specifies the offsite support available to respond to the nuclear generating stations.

1. On-Shift Emergency Response Organization Assignments

The normal plant personnel complement is established with the Site Vice President having overall authority for site operations. The Site Vice President directs the site organization in the management of the various departments while the {Shift Supervisor} retains the responsibility for actual operation of plant systems. Emergency Preparedness must consider the capabilities of the normal plant organization, the Licensee Offsite Emergency Response Organizations, and the non-Licensee Emergency Response agencies. The initial phases of an emergency situation at a nuclear site will most likely involve a relatively small number of individuals. These individuals must be capable of (1) determining that an emergency exists; (2) providing initial classification and assessment; and (3) promptly notifying other groups and individuals in the emergency organization. The subsequent phases of the emergency situation may require an increasing augmentation of the emergency organization.

The site has personnel on shift at all times that can provide an initial response to an Emergency Event. Table B-1a, contained in the {BBNPP} Annex, outlines the plant on-shift emergency organization and its relation to the normal staff complement. Members of the on-shift organization are trained on their responsibilities and duties in the event of an emergency and are capable of performing all response actions in an Unusual Event or the initial actions of higher classifications.

<u>On Shift Personnel</u>

Shift Personnel have the capability at all times to perform detection, mitigation, classification, and notification functions required in the early phases of an emergency. (Refer to Section A.1.b.1.) Shift augmentation and further ERO involvement will be determined by the extent and magnitude of the event. When a transition to Severe Accident Management Guidelines (SAMG) is initiated, the shift crew assumes the duties and responsibilities of the SAMG Implementers.

<u>{Shift Supervisor}:</u> While acting as {Interim Emergency Director}, will take immediate action during an emergency and will activate the Site ERO, as appropriate. In the {Shift Supervisor's} absence or incapacitation, the line of succession is defined by the Unit's Operations Procedures and {EPIPs}.

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

Control Room Operators: At least two qualified Reactor Operators are assigned to each shift. They are responsible for operating plant equipment from the Control Room.

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

Radiation Protection: The Site Radiation Protection personnel are responsible for the handling and monitoring of radioactive materials. Included in this organization are Health Physicists, Radiation Protection Supervisors and Technicians.

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

Security: The Site Security personnel are responsible for the physical security of the site. Included in this organization are Security Supervisors and Security Guards.

A Unit Fire Brigade is established by designating trained individuals from the above listed groups as brigade members.

An individual (or group of individuals) on each shift is trained and made available to act as the Emergency Communicator. This individual can notify site personnel, {Commonwealth} and Local agencies and the NRC. The {Emergency Communicator} will maintain communications as necessary until relieved by members of the on-call ERO.

2. Authority over the Emergency Response Organization

The {Shift Supervisor}, {Emergency Plant Manager} or {Emergency Director} in Command and Control, is the designated {BBNPP} individual who has overall authority and responsibility, management ability, and technical knowledge for coordinating all emergency response activities.

Control Room:	{Shift Supervisor} is initially in command until relieved by on-call ERO members.
TSC:	{Emergency Plant Manager} may relieve the {Shift Supervisor} of all Command and Control Responsibilities until the {Emergency Director} is ready to assume these duties. Maintains some unit specific command and control responsibilities even after being relieved by the {Emergency Director}.
EOF:	{Emergency Director} assumes overall command and control of the {BBNPP} emergency response.

3. Criteria for Assuming Command and Control (Succession)

Emergency personnel assume responsibility for their positions upon receiving notification to activate. The responsibility for initial assessment of and response to an emergency rests with the {Shift Supervisor}. The {Shift Supervisor} is the {Interim Emergency Director} and has the {Emergency Director's} responsibilities and authority until relieved by a qualified {Emergency Plant Manager} or the {Emergency Director}. The {Emergency Plant Manager}, after relieved the {Shift Supervisor} of the {Emergency Director} responsibilities, is responsible for continued assessment of the severity of the emergency and overall direction of the ERO as appropriate in accordance with the guidance provided in the E-Plan, the Unit Annex and the plan emergency implementing procedures. Final succession is achieved when the {Emergency Director} assumes overall Command and Control, and directs the overall {BBNPP} Emergency Response activities.

The {Shift Supervisor} is relieved of Command and Control as soon as possible after the declaration of an Alert (or higher classification if Alert not declared). Command and Control may be transferred directly to the {Emergency Director}, or transferred to the {Emergency Plant Manager} on an interim basis. Command and Control does not transfer until the following criteria have been met:

- Adequate staff levels are present in support of the non-delegable responsibilities.
- The staff has been fully briefed as to the status of the event and the currently proposed plan of action.
- A turnover between the individual relinquishing Command and Control and the individual assuming Command and Control has been made.

Although the {BBNPP} ERO fulfills all regulatory requirements for emergency response, it may be altered by the {Emergency Director} or the {Emergency Plant Manager}. This type of alteration will be based upon identified needs within the ERO, event dependent criteria, and identified needs of the company as a whole to respond to the event.

4. Non-Delegable Responsibilities

Non-delegable responsibilities include the following functions:

- Event classification.
- Protective Action Recommendations (PARs) for the general public.
- Notification of offsite authorities (approval of {Commonweath}/local and NRC notifications).
- Authorization of emergency exposure controls in excess of 5 Rem (0.05 Sv) TEDE, emergency CDE thyroid exposures and the issuance of potassium iodide (KI), for the {BBNPP} emergency workers.

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

The {Emergency Plant Manager} will assume overall authority and responsibility for performing all of the non-delegable duties from the {Shift Supervisor}. The {Emergency Director} (EOF) will subsequently relieve the {Emergency Plant Manager} (TSC) of overall Command and Control and assume the non-delegable responsibilities for PAR determination and notifications to offsite authorities.

Transition of "Non-Delegable" Responsibilities

{Interim Emergency Director} (Control Room)		**{Emergency Plant Manager}** (TSC)		**{Emergency Director}** (EOF)
Classification	→	Classification		
PARs	→	PARs	→	PARs
Notifications	→	Notifications	→	Notifications
Emergency Exposure Controls	→	Emergency Exposure Controls (Onsite Personnel) Field Teams when directed from TSC)		Emergency Exposure Controls (EOF Field Teams when directed from EOF)

5. **Emergency Response Organization Positional Responsibilities**

Table B-1b outlines ERO positions required to meet minimum staffing and full augmentation of the on-shift complement at an Alert or higher classification, and the major tasks assigned to each position. The full augmentation staffing levels are used as a planning basis to cover a wide range of possible events. For extended events (one which lasts for more than 24 hours), actual staffing will be established by the {Emergency Director} based on the event and personnel availability. However, additional staffing or reduced staffing will only occur after discussion concerning the impact on plant operations and emergency response.

The overall {BBNPP} ERO is made up of three sub organizations:

- The first is called the Plant Emergency Response Organization. It is responsible for the onsite emergency response activities. These activities include protecting plant personnel, mitigating the results of the event and keeping the offsite organization informed of onsite events and actions being taken.

- The second is called the Offsite Emergency Response Organization. It is responsible for the licensee's offsite emergency response activities. These activities include providing information to offsite authorities, monitoring offsite results of the event, supporting the onsite organization and obtaining outside resources to support emergency response efforts.

- The third is called the Public Information Emergency Response Organization. It is responsible coordinating with other Emergency Response Organizations (Federal, {Commonwealth} and Local) for providing accurate information to the public about the event through the news media.

The Offsite Emergency Response Organization and the Public Information Emergency Response Organization combined may be referred to as the site Recovery Organization by {Commonwealth} and local emergency plans.

Specific responsibilities for each sub-organization and related positions are as follows:

a. <u>Plant Emergency Response Organization:</u> The Plant ERO is the onsite group that is activated during an emergency. It functions under the {Emergency Plant Manager}, who is responsible for organizing and coordinating the emergency efforts at and within the immediate vicinity of the site (including carrying out all onsite emergency efforts and the initial offsite environs monitoring efforts necessary to assess plant releases).

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

   - Plant systems operations

- Radiological survey and monitoring (including Environs Monitoring)
- Firefighting
- Rescue operations and First Aid
- Decontamination
- Security of plant and access control
- Repair and damage control
- Personnel protection including Assembly, Accountability and Evacuation
- Communications
- Initial Liaison responsibilities with Federal, {Commonwealth} and local authorities

When plant conditions warrant entry into the Severe Accident Management Guidelines (SAMGs), the {Emergency Plant Manager} or other qualified individual assumes the role of SAMG Decision-Maker*.* The {Engineering Director} and/or another qualified individual(s) assumes the role of SAMG Evaluato*r* (at least 2 are required), and the Control Room staff assumes the role of SAMG Implementers. Control Room personnel will perform mitigating actions for severe accidents per EOPs prior to TSC activation.

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

1) <u>{Shift Supervisor} ({Interim Emergency Director}) Control Room</u>

A {Shift Supervisor} is on duty 24 hours a day and has {Emergency Director} responsibilities in a declared emergency until relieved. While serving in this capacity the {Shift Supervisor} is responsible for:

- Activating the ERO (as deemed appropriate or as procedurally required).
- Initiating the NRC Emergency Response Data System (ERDS).
- Performing those duties outlined in Section B.5.a.3 for the {Emergency Plant Manager}. The responsibilities described for the {Emergency Plant Manager} apply to either the {Shift Supervisor} or the {Emergency Plant Manager} depending on which individual is in Command and Control.

The on-duty {Shift Supervisor} directs the activities of the operating crew and is responsible for the safe operation of the plant in compliance with the site NRC operating license and the site operating procedures. The {Shift Supervisor}, after relinquishing Command and Control, functionally reports to the Operations Manager in the TSC.

The {Shift Supervisor's} responsibilities, when not in Command and Control, are described below:

- The authority and responsibility to shutdown the reactor when determined that the safety of the reactor is in jeopardy or when operating parameters exceed any of the reactor protection system set-points and automatic shutdown does not occur;
- To ensure a review has been completed to determine the circumstance, cause, and limits under which operations can safely proceed before the reactor is returned to power following a trip or an unscheduled or unexplained power reduction;
- The responsibility to be present at the plant and to provide direction for returning the reactor to power following a trip or an unscheduled or unexplained power reduction;
- The responsibility to adhere to the station Technical Specifications and to review routine operating data to assure safe operation;
- The responsibility to identify applicable EALs and emergency classifications;
- The responsibility to adhere to plant operating procedures and the requirements for their use. During an emergency, operations personnel may depart from approved procedures where necessary to prevent injury to personnel, including the public, or damage to the facility consistent with the requirements of 10 CFR 50.54(x) and (y); and
- Supervise the plant operation activities of the Control Room Crew and {Emergency Communicator(s)} in the Control Room.

2) {Emergency Plant Manager} TSC

The {Emergency Plant Manager} reports to the {Emergency Director} and supervises and directs the Plant ERO. The {Emergency Plant Manager}'s responsibilities include organizing and coordinating the onsite emergency efforts. Additionally, the {Emergency Plant Manager} has the requisite authority, plant operating experience and qualifications to implement in plant recovery operations.

a) {Emergency Plant Manager} Responsibilities while in Command and Control:

- Perform all non-delegable responsibilities of the {Emergency Director} in Command and Control until relieved by the EOF.
- Conduct personnel assembly/accountability and evacuation of non-essential personnel at Site Area Emergency, General Emergency or as conditions warrant.

- If the emergency involves a hazardous substance and/or oil discharges, ensure that appropriate notifications and responses have been made.
- Determine if the OSC is to remain activated at the Alert Classification.

b) {Emergency Plant Manager} Responsibilities while not in Command and Control:

- Event Classification.
- Emergency exposure controls.
- Protective actions for all onsite personnel.
- Supervision of the Plant ERO.
- Inform the {Emergency Director} and onsite NRC as to the status of the plant.
- Assist the {Emergency Director} in the acquisition of information for the {Commonwealth}/local notifications, NRC notification and offsite agency updates.
- Provide information and recommendations to the {Emergency Director}.
- Implement plans, procedures and schedules to meet emergency response objectives as directed by the {Emergency Director}.
- Request from the Offsite ERO any additional material, personnel resources or equipment needed to implement response plans and operations.
- Assume the duties and responsibilities of SAMG Decision-Maker when a transition to Severe Accident Management Guidelines (SAMGs) is initiated. This responsibility can be delegated to the Operations Manager if qualified.

3) {TSC Director} TSC

The {TSC Director} reports to the {Emergency Plant Manager} and is responsible for the content of information transmitted from the TSC to other agencies (or facilities) and for documenting information received at the TSC in coordination with the {Emergency Plant Manager}. Responsibilities include:

- Verify that qualified individuals are filling {Emergency Communicator} positions in the Control Room, TSC and OSC.

- Activate, or verify activation of the Emergency Response Data System (ERDS).
- {Ensure the Commonwealth has access to appropriate SPDS data.}
- Supervise the activities of the {Administrative Support Manager} and Communicator positions.
- Ensure that communications are established with appropriate parties as directed by the {Emergency Plant Manager}.
- Ensure that all required notifications to offsite governmental agencies (Commonwealth, local and NRC) are timely and accurate.
- Act as the Licensee Liaison to any NRC Site Team Representatives.
- Ensure that the NRC Site Team Representatives are directed to their appropriate counterparts.
- Assist the {Emergency Director} in the acquisition of information for off-site agency updates.
- Record and relay inquiries to the {Emergency Plant Manager}. In addition, record responses to such inquiries prior to transmission.
- Assist the {Emergency Plant Manager} in maintaining proper records.

4) {Emergency Communicators} CR/TSC/OSC/EOF

The communicators are responsible for transmitting/receiving information to and from the TSC, OSC, EOF and Control Room. General responsibilities assigned to all Communicators include:

- Establish communications with appropriate parties as directed.
- Transmit information that has been reviewed and/or approved by the responsible Manager or Coordinator.
- Document time, date and information being transmitted or received on appropriate forms.
- Record and relay inquiries and the responses to those inquiries.
- Assist appropriate Managers and Coordinators in maintaining proper records and logs of emergency related activities.
- Gather, record and post appropriate information.

a) Specific responsibilities assigned to the {TSC Communicator} include:

- Communicate and receive information via dedicated communications circuit or commercial telephone line with appropriate agencies prior to the EOF accepting Command and Control.
- Monitor offsite communications until released by the {TSC Director}.

b) Specific responsibilities assigned to the {Operations Communicators} (TSC and Control Room):

- Relay requests from the Control Room and TSC for the dispatching of OSC Teams.
- Inform the Control Room, TSC, and EOF of significant changes in event status (e.g. changes in classification, command and control, initiation of site assembly, accountability, evacuation, etc.).
- Appraise the TSC and EOF staff of the overall plant condition and significant changes to system and equipment status.
- Appraise the Control Room of the status of OSC Team activities.

c) Specific responsibilities assigned to the {Emergency Notification System (ENS) Communicator} include:

- Notify the NRC of changes in event classification.
- Transmitting appropriate data to the NRC.
- Responding to NRC inquiries.
- Provide real time updates of significant changes to plant and system status and responses to NRC inquiries.
- Maintain continuous communications with the NRC, if requested, via the NRC ENS phone or commercial telephone line.

d) Specific responsibilities assigned to the {HPN Communicator} include:

- Maintain continuous communications with the NRC, if requested, via the NRC Health Physics Network (HPN) phone or commercial telephone line.
- Communicate current Health Physics information to NRC representatives, as requested.
- Coordinate the communications of radiological information to the NRC between the TSC and the EOF (onsite vs. environmental data).

5) {Operations Manager} TSC

The {Operations Manager} reports to the {Emergency Plant Manager}. Major functions include determining the extent of the site emergencies, initiating corrective actions, and implementing protective actions for onsite personnel. In the event that the {Emergency Plant Manager} becomes incapacitated and can no longer fulfill the designated responsibilities, the {Operations Manager} will normally assume the responsibilities until relieved by another qualified {Emergency Plant Manager}. Responsibilities include:

- Coordinate TSC efforts in determining the nature and extent of emergencies pertaining to equipment and plant facilities in support of Control Room actions.
- Initiate immediate corrective actions to limit or contain the emergency, invoking the provisions of 10 CFR 50.54(x) if appropriate, and specifically when addressing Severe Accident Management Guidelines (SAMG).
- Recommend equipment operations checks and miscellaneous actions to the Control Room in support of restoration and accident mitigation.
- Approve special procedures and implement as required under the provisions of 10 CFR 50.54(x).
- Assist the {Maintenance Manager} in determining the priority assigned to OSC activities.
- Organize and direct medical response efforts for injured personnel.
- Ensure adequate staffing of the Control Room and TSC.
- Ensure the {Shift Supervisor} is informed of OSC staffing utilization and activities.
- Identify steps or procedures that the Operations staff should be utilizing to properly respond to the emergency condition.
- Assist the {Emergency Plant Manager} in evaluating changes in event classification.
- Supervise the activities of the {Operations Communicator} and the {ENS Communicator} in the TSC.
- Act as the Operations liaison with the appropriate NRC Site Team Representative.
- At the direction of the {Emergency Plant Manager}, assume the duties and responsibilities of the Evaluator, or Decision-Maker if qualified, when transition to Severe Accident Management Guidelines (SAMG) is initiated.

6) {Engineering Director} TSC

The {Engineering Director} reports to the {Emergency Plant Manager} and directs a staff in performing technical assessments of site emergencies and assists in recovery planning. Responsibilities include:

- Accumulate, tabulate and evaluate data on plant conditions.
- Evaluate plant parameters during an emergency to determine the overall plant condition.
- Coordinate core damage assessment activities.
- Identify data points and control parameters that the Operations staff should monitor.
- Ensure that current and adequate technical information is depicted on status boards.
- Identify and direct staff in the development of special procedures needed to effect long-term safe shutdown or to mitigate a release.
- Supervise the total onsite technical staff effort.
- Act as the Engineering liaison with {Commonwealth} and appropriate NRC Site Team representatives.
- Assist the {Radiation Protection Manager} for onsite radiological/technical matters.
- Assist the {Emergency Plant Manager} in evaluating plant based PARs (prior to EOF accepting command and control) and changes in event classification.
- Supervise the activities of the {TSC Communicator}.

7) {Technical Support Staff} TSC

The {TSC Technical Support Staff} consists of the following minimum staff engineering positions:

- {Electrical Engineer}
- {Mechanical Engineer}
- {Reactor Engineer}

In addition, site engineering support will be augmented on an as needed basis to support accident assessment and mitigation activities.

8) {Administrative Support Manager} TSC

The {Administrative Support Manager} reports to the {TSC Director} and provides administrative services in support of emergency/recovery operations. Responsibilities include:

- Coordinate shift relief and continual staffing of the site.
- Arrange for clerical staff at the TSC, OSC and Control Room.
- Assist the {Security Coordinator} in coordinating ERO and site activities in support of on-going security contingency, accountability or site/area evacuation efforts.
- Support the processing of special procedures and interim reports during an emergency.
- Ensure that event status and priority logs are being maintained in the TSC.
- Coordinate record-keeping efforts for the emergency event.
- Arrange for food, sleeping facilities and other necessary accommodations for onsite emergency workers.
- Arrange for specialized training of emergency response personnel as needed.

9) {Radiation Protection Manager (RPM)} TSC

The {Radiation Protection Manager} reports to the {Emergency Plant Manager} and supervises the activities of the {Radiation Controls Engineer (RCE)} and {Radiation Controls Coordinator Director (RCC)} and {Radiation Protection Staff}. The RPM directs a {Radiation Protection staff} in determining the extent and nature of radiological or hazardous material problems onsite. Responsibilities include:

- Accumulate, tabulate and evaluate data on plant conditions such as meteorological and radiological monitoring readings, and other pertinent data.
- Act as the Radiological liaison with the appropriate NRC Site Team representative.
- Ensure use of protective clothing, respiratory protection, and access control within the plant as deemed appropriate to control personnel exposures.
- Ensure that appropriate bioassay procedures have been implemented for onsite personnel when a radioactivity incident has occurred.

- Ensure that personnel are decontaminated, if necessary.
- Authorize personnel exposures below 5 Rem (0.05 Sv) TEDE (EPA-400 lower limit).
- Assist the {Emergency Plant Manager} in determining if exposures in excess of the 5 Rem (0.05 Sv) TEDE (EPA-400 lower limit) or emergency CDE Thyroid limits are necessary.
- Advise the {Emergency Plant Manager} of situations when the use of KI should be considered.
- Assist the {Emergency Plant Manager} in evaluating dose-based PARs (prior to EOF accepting command and control) and changes in radiological event classification.
- Advise the {Emergency Plant Manager} and {Radiological Assessment Director} (in EOF) of changes in radiological release status.
- Assist the {Operations Manager} in planning rescue operations and provide monitoring services as required, including the transfer of injured and/or contaminated personnel.
- Coordinate with the {Security Coordinator} to determine the routes to be used for evacuation of non-essential personnel.
- Assure additional radiation protection personnel and/or equipment is arranged for, as necessary.

10) {Radiation Controls Engineer (RCE)} TSC

The {Radiation Controls Engineer} reports to the {Radiation Protection Manager} and coordinates the radiological and chemistry interface between the technical support engineering efforts. Responsibilities include:

- Monitor area and process radiation monitors to identify trends and potential hazards within the station.
- Evaluate plant environmental factors regarding radiological and other hazardous material conditions.
- Evaluate radiological and hazardous material surveys and chemistry sample results as appropriate.
- Direct the performance of sampling activities through coordination with the OSC Chemistry Lead in support of operations and core damage estimates as necessary.
- Coordinate radiological and chemistry information with the{Reactor Core Engineer} in support of core damage assessment.

11) {Radiation Controls Coordinator (RCC)} OSC

The {Radiation Controls Coordinator (RCC)} reports to the {Radiation Protection Manager}. The RCC coordinates site and in-plant Radiation Protection response activities through the {OSC Leads}. Responsibilities include:

- Support the {OSC Leads} in the dispatching of OSC Teams.
- Assist the {Operations Manager} in planning radiological controls for personnel dispatched from the Control Room.
- Ensure the proper use of protective clothing, respiratory protection, and access controls in the plant as appropriate to control personnel exposure.
- Monitor habitability concerns impacting access to plant and site areas.
- In coordination with the {OSC Leads}, assemble and dispatch the Monitoring Teams as required.
- Supervise the activities of the {HPN Communicator} in the TSC.
- Request additional Radiation Protection personnel and/or equipment, as necessary in support of site activities and staff relief.
- Prior to EOF Radiological Assessment Group staffing:
  - Perform dose assessments and provide appropriate dose-based PARs.
  - Coordinate Monitoring Team activities.
  - Monitor meteorological conditions and remain cognizant of forecast data.
- Following EOF Radiological Assessment Group staffing:
  - Transfer control of the Monitoring Teams to the EOF {Environmental Assessment Director} when appropriate.
  - Transfer responsibility of dose assessment activities to the EOF {Radiological Assessment Director}.
  - Assist the EOF {Environmental Assessment Director} in the acquisition of information for the off-site agency updates.

12) {Maintenance Manager} TSC

The {Maintenance Manager} reports to the {Emergency Plant Manager} and directs a staff in providing labor, tools, protective equipment and parts needed for emergency repair, damage control and recovery efforts to place the plant in a safe condition or return the plant to its pre-accident status. Responsibilities include:

- Direct the total onsite maintenance and equipment restoration effort.
- Request additional equipment in order to expedite recovery and restoration.
- Supervise the activities of the {OSC Director}.
- Ensure the {Operations Manager} is informed of OSC staffing utilization and activities.
- In coordination with the {Operations Manager}, determine the priority assigned to OSC activities.
- Ensure adequate staffing of the OSC.
- Assist in rescue operations.
- Identify required procedures that need to be written or implemented in support of the response efforts.

13) {Security Coordinator} TSC

The {Security Coordinator} reports to the {Emergency Plant Manager} and maintains plant security and personnel accountability at the site. Responsibilities include:

- Maintain plant security and account for all personnel within the protected area.
- Assist the {Emergency Plant Manager} in evaluating changes in security related threats and event classifications.
- Identify any non-routine security procedures and/or contingencies that are in effect or that require a response.
- Expedite ingress and egress of emergency response personnel.
- Coordinate with the {Radiation Protection Manager} in controlling ingress and egress to and from the Protected Area if radiological concerns are present.

- Provide for access control to the Control Room, TSC and OSC, as appropriate.
- Expedite entry into the Protected Area, as necessary, for the NRC Site Team.
- Act as the Security liaison with the appropriate NRC Site Team representative.
- Assist the {Radiation Protection Manager} in determining personnel evacuation routes as necessary.
- Coordinate the evacuation of site non-essential personnel with the appropriate Local Law Enforcement Agencies (LLEAs).

14) {Operations Support Center Director} OSC

The {OSC Director} reports to the {Maintenance Manager} and supervises the activities of OSC personnel. Responsibilities include:

- Assign tasks to designated Leads as available:
  - Operations
  - Mechanical Maintenance
  - Electrical/I&C Maintenance
  - Radiation Protection
  - Chemistry
- Coordinate with the OSC Operations Lead in the dispatch of Operations personnel to support Control Room and OSC Team activities.
- Notify the Control Room and TSC prior to dispatch of any OSC teams into the plant.
- Maintain OSC resources including personnel, material, and equipment.
- Maintain accountability for all individuals dispatched from the OSC.
- Conduct periodic briefings on the overall plant status, emergency response activities, and site priorities.

15) {OSC Leads} OSC

{OSC Leads} report to the {OSC Director} and are assigned from the following site departments:

- Mechanical Maintenance
- Electrical / Instrument and Control

- Radiation Protection
- Chemistry
- Operations (designated Operations representative)

The {OSC Lead} assigned to an OSC team is responsible at all times for the safety of team personnel and to keep the {OSC Director} apprised of team status. Specifically, the {OSC Leads} are responsible for the managing and supervising OSC team personnel, including:

- Conduct of adequate pre-dispatch briefings.
- Ensuring adequate protective equipment and measures have been identified.
- Tracking of OSC team activities while dispatched.
- Debriefing of team personnel upon return to the OSC.

16) {OSC Team Members} OSC

Technicians and operations personnel form an OSC Pool. OSC Pool personnel form the teams that perform emergency mitigation tasks in the plant. Individuals from operations, maintenance, chemistry and operations are always available as part of the OSC Pool. Individuals from other plant organizations may also be called to assist in emergency mitigation efforts.

b. Offsite Emergency Response Organization: The Offsite ERO, part of the overall {BBNPP} ERO, is activated during an emergency. It functions under the {Emergency Director}, who is responsible for organizing and coordinating the overall emergency efforts. The Offsite ERO focuses on the offsite interfaces and support of the Plant ERO efforts.

The Offsite ERO is activated in the Emergency Operations Facility (EOF) at an Alert. The EOF Organization is responsible for evaluating, coordinating and directing the overall company activities involved in the emergency response. Within the EOF, the {Emergency Director} shall assume Command and Control from the {Emergency Plant Manager} when the classification escalates to an Alert or higher, unless the EOF capabilities are limited such that the overall control and responsibility for PARs and offsite notifications cannot be assumed. The EOF may also function in a supporting role to the site when the {Emergency Plant Manager} maintains Command and Control.

The Offsite ERO consists of site personnel (with some corporate support) who are involved with emergency response efforts necessary to coordinate the {BBNPP} emergency response with offsite agencies response efforts. This organization operates out of the Emergency Operations Facility (EOF). Collectively, members of the Offsite ERO provide for the following activities during an emergency:

- Notifications and Communications with offsite authorities
- Coordinating Emergency Response activities with offsite Emergency Responders.
- Protective Action Recommendations
- Offsite Radiological survey and monitoring
- Support of the Public Information Organization, including approval of new releases.
- Obtaining offsite support for onsite mitgative actions

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

1) {Emergency Director} EOF

Although the {Emergency Director} has overall authority for all aspects of the Licensee's emergency response efforts, most of his/her efforts are focused on the interface between the company's ERO and offsite authorities and ensuring the Plant ERO receives the support necessary to mitigate results of the event.

a) When the {Emergency Director} has Command and Control, the ongoing responsibilities include:

- Overall Command and Control of emergency response activities and the non-delegable responsibilities for PAR determination and the notification of offsite authorities.
- Ensure that Federal, {Commonwealth} and local authorities and industry support agencies remain cognizant of the status of the emergency situation. If requested, dispatch informed individuals to offsite governmental Emergency Operation Centers (EOCs).
- Approve the technical content of the Licensee press releases prior to their being released to the media.
- Coordinate all the Licensee activities involved with the emergency response.
- Ensure off-site agency updates are periodically communicated as required/requested.
- Request assistance from non-Licensee emergency response organizations, as necessary.

2) {Emergency Offsite Facility (EOF) Director} EOF

The {EOF Director} reports to the {Emergency Director} and has the authority, management ability and technical knowledge to assist the {Emergency Director} in the management of {BBNPP} offsite ERO.

{EOF Director} Responsibilities include:

- Direct and coordinate the activation and response efforts of the EOF staff in support of the {Emergency Director}.
- Evaluate the need to augment the EOF staff based on events in progress.
- Monitor information flow within the EOF to ensure that facility activities remain coordinated.
- Prepare {Commonwealth}/local notification forms with the assistance of the {Radiological Assessment Director} and the {Technical Support Manager}.
- Coordinate services as necessary to support EOF operations.
- Coordinate with the {Administrative Support Manager} for continual shift staffing requirements.
- Assist in the conduct of {Emergency Director} duties.
- Act as the designated alternate for approval of the technical content of the Licensee Press Releases and information released to the News Media.
- Act as purchasing agent in support of the TSC for contract negotiation / administration.

3) {Technical Support Manager} EOF

The {Technical Support Manager} reports to the {EOF Director} and is responsible for obtaining and analyzing plant status information and ensuring that it is disseminated. Specific responsibilities include:

- Assist the {Emergency Director} in monitoring changes in event classification.
- Assist the {Emergency Director} in determining plant-based PARs when necessary.
- Provide information to the {EOF Director} for completing the {Commonwealth}/local notification form.

- Provide the {Emergency Director} information concerning the status of plant operations, and recommendations for mitigating the consequences of the accident.

- Coordinate the overall Licensee engineering support from corporate staff and other outside sources.

- Interface with Industry and contractor engineering support organizations.

- Ensure that the {Radiological Assessment Director} is informed of changes in plant status that impacts or potentially impacts the offsite environment or PARs.

- Provide technical information on facility and system design.

- Assist in the development of post-accident recovery measures.

4) {Operations Advisor} EOF

The {Operations Advisor} reports to the {Technical Support Manager}, directs the {ENS Communicator}, and is responsible for obtaining and analyzing plant status information and ensuring that it is disseminated. Specific responsibilities include:

- Monitor the plant parameter communication line to keep appraised of:
  - Control Room activities including progress on Emergency Operating Procedures.
  - Significant changes in plant system/equipment status and critical parameters.
  - Possible changes in event classification.
- Identify and track critical parameters for the identification and trending of current plant status information.
- Assist the station in identifying Operations resources from corporate staff or unaffected stations for direct support of plant shift operations personnel.
- Assist the {ENS Communicator} in the completion of the NRC Event Notification Worksheet and in responding to NRC inquiries.
- Ensure that the {Radiological Assessment Director} is informed of changes in plant status that impact or potentially impact the offsite environment or PARs.
- Monitor the EOF Communicator to remain aware of TSC technical support activities, strategies and priorities.
- Assist the {Radiological Assessment Director} in acquiring technical information pertaining to release pathway and core damage assessment.

5) {Radiological Assessment Director} EOF

The {Radiological Assessment Director} reports to the {EOF Director} and directs the activities of the EOF Radiation Assessment staff. Specific responsibilities include:

- Recommend changes in event classification and PARs based upon effluent releases or dose projections.
- Assist the {EOF Director} in the evaluation of the significance of an emergency with respect to the public.
- Notify the {EOF Director} of meteorological changes that may impact identification of downwind areas.
- Advise the {Emergency Director} of protective actions taken by the site for plant personnel.
- Assist the TSC in the planning and coordination of activities associated with the evacuation of non-essential personnel.
- Advise the {Emergency Director} on the need for emergency exposures or for issuance of KI to the Monitoring Teams or Licensee personnel required to enter the plume.
- Determine the need for and contact occupational health / industrial safety personnel for assistance.
- Monitor plant radiological conditions and advise the TSC {Radiation Protection Manager} of any adverse trends or potential release pathways that may impact existing event classification.
- Assist in the completion and review of the {Commonwealth} / local notification form.
- Maintain cognizance of environmental sampling activities.
- Ensure {Commonwealth} authorities are provided information pertaining to {BBNPP} Monitoring Team activities and sample results.
- Assist the site in the following areas:
  - Planning and coordination of activities associated with the evacuation of non-essential personnel.
  - Acquisition of additional instrumentation, dosimetry, protective equipment and radiological support personnel.

- Assist and interface with the EOF Support personnel and the site in the development of plans for plant surveys, sampling, shielding, and special tools in support of waste systems processing and design modification activities.
- Upon request, provide in-plant health physics data to Emergency Public Information personnel and the {HPN Communicator}.
- Upon request, provide environmental data to Emergency Public Information personnel.

6) {Environmental Assessment Director} EOF

The {Environmental Assessment Director} reports to the {Radiological Assessment Director} and directs the Monitoring Teams. Responsibilities include:

- Coordinate the transfer of control of the Monitoring Teams if initially under the direction of the TSC {Radiation Controls Coordinator}.
- Ensure communications are established with the TSC to obtain information on the accident conditions, meteorological conditions and estimates of radioactive material releases.
- Maintain cognizance of Monitoring Team exposure. When warranted, ask the {Radiological Assessment Director} to initiate an evaluation of the need for administering KI to the Licensee workers.
- Determine needs of the {Radiological Assessment Director}, the {Radiological Assessment Specialist}, and the {HPN Communicator(s)} for updates on Monitoring Team data and ensure distribution of new data to them in accordance with those needs.
- Evaluate and coordinate additional equipment and personnel as necessary from unaffected units to augment and/or relieve site Monitoring Teams.
- Establish and maintain contact with the dispatched Monitoring Teams.
- Document the {Environmental Assessment Director's} instructions and then relay this information to the Monitoring Teams.
- Document environmental data reported by the Monitoring Teams.
- Periodically obtain and document information on Monitoring Team radiological exposure.
- Promptly report new environmental or Monitoring Team exposure data to the {Radiological Assessment Director}.

- Document questions and answers directed to and received from the Monitoring Teams. Ensure the {Radiological Assessment Director} is cognizant of these information requests and relay replies to these requests.

- Advise the {Radiological Assessment Director} of changes in event classification based on effluent releases or dose projections.

- Remain cognizant of forecast and meteorological data and ensure the status is updated periodically.

- Notify the {Radiological Assessment Director} of meteorological changes that may impact identification of downwind areas.

- Upon request, provide release and dose assessment data to Emergency Public Information personnel and the {HPN Communicator}.

7) {Radiological Assessment Coordinator} EOF

The {Radiological Assessment Coordinator} reports to the {Radiological Assessment Director} and directs the activities of the {Radiological Assessment Specialist} and the {HPN Communicator}. Responsibilities include:

- Interpret radiological data and provide PARs based upon dose projections to the EOF {Radiological Assessment Director}.

- Advise the {Radiological Assessment Director} of changes in event classification based on effluent releases or dose projections.

- Initiate evaluation of the need for administering KI to Licensee workers when requested by the {Environmental Assessment Director}.

- Remain cognizant of forecast and meteorological data and ensure the status is updated periodically.

- Notify the {Radiological Assessment Director} of meteorological changes that may impact identification of downwind areas.

- Upon request, provide release and dose assessment data to Emergency Public Information personnel and the {HPN Communicator}.

8) {Radiological Assessment Specialist} EOF

The {Radiological Assessment Specialist} reports to the {Radiological Assessment Director}. Responsibilities include:

- Perform dose projections using the Dose Assessment computer models as directed by the {Radiological Assessment Director}.

- Monitor meteorological and plant effluent conditions.
- Notify the {Radiological Assessment Director} of meteorological changes that may impact identification of downwind areas.
- Evaluate the need for administering KI to the Licensee workers when requested by the {Radiological Assessment Director}.

9) {HPN Communicator} EOF

The {HPN Communicator} reports to the {Environmental Assessment Director}. Responsibilities include:

- Provide updates and respond to inquiries from the NRC on offsite environmental data, release status, dose projections and changes to PARs for the general public.
- Obtain release and dose assessment data from the {Radiological Assessment Director} and Monitoring Team data from the {Environmental Assessment Director}.
- Maintain continuous communications with the NRC, if requested, via the NRC HPN phone or commercial telephone line.
- Communicate current Health Physics information to NRC representatives, as requested.

10) {Administrative Support Manager} EOF

The {Administrative Support Manager} reports to the {EOF Director} and directs the activities of the administrative, security, and liaison personnel. Responsibilities include:

- Ensure contact is made and communications are maintained with appropriate non-Licensee personnel whose assistance may be required to terminate the emergency conditions and to expedite the recovery.
- Advise the {EOF Director} concerning the status of activities relating to governmental interfaces.
- Obtain support from Human Resources, the Comptroller's Office, the Legal Department, Accounting Department and others as required.
- Ensure that access to the EOF is limited to Emergency Responders and authorize admittance to non-Licensee personnel.
- Implement the Licensee Fitness for Duty Program.
- Ensure that NRC Site Team Representatives are directed to the {Regulatory Liaison} upon arrival at the EOF.

- Ensure that updates and information are provided to the EOC Liaisons and to offsite officials present in the EOF.
- Assist in obtaining and coordinating additional technical expertise to support plant requests, including the Licensee corporate staff, unaffected units and vendor/contractors.
- Coordinate maintenance of EOF equipment as necessary.
- Ensure shift relief and continual staffing for the EOF.
- Direct the activities of the Computer Maintenance Staff.
- Direct the clerical staff and ensure the clerical requirements for the other EOF staff are met.
- Obtain clerical support for the EOF and JIC.
- Coordinate shift relief and continual staffing for the EOF.
- Obtain services as appropriate to support operation of the EOF.
- Obtain additional resources to support access control measures needed at the EOF and JIC.

11) {Computer Support} EOF

The {Computer Support} staff reports to the {Administrative Support Manager} (EOF). Responsibilities include:

- Assist any personnel in logging in, initializing or using a desired computer program.
- Investigate and repair problems encountered with communications equipment and computer equipment/applications.

The staff assigned to computer support duties may be dispatched to assist other emergency facilities personnel as needed.

12) {Commonwealth/Local Communicator} EOF

The {Commonwealth/Local Communicator} reports to the {Administrative Support Manager}. Responsibilities include:

- Communicate and receive information via the {Commonwealth} / Local notification system or commercial telephone line with appropriate {Commonwealth} and local agencies.
- Ensure that the {Administrative Support Manager} is made aware of issues and questions raised by offsite agencies and then relay the replies to these requests.

13) {EOC Communicator} EOF

The {EOC Communicator} reports to the {Administrative Support Manager}. Responsibilities include:

- Coordinate and dispatch EOC Liaisons as needed or requested.
- Establish and maintain periodic contact with each location where the Licensee EOC Liaisons have been dispatched.
- Ensure EOC Liaisons are provided event information and notifications.
- Ensure that the {Administrative Support Manager} is made aware of issues and questions raised by offsite agencies and then relay the replies to these requests.

14) {County EOC Liaison(s)} County EOCs

The {County EOC Liaison(s)} will be dispatched to County Emergency Operations Centers (EOCs) based on established agreements with the counties. The {County EOC Liaison(s)} use the {EOC Communicator} as their contact at the EOF. Responsibilities include:

- Monitor and report County EOC activities to the EOF.
- Conduct briefings and answer questions.
- Provide simplified explanations to EOC personnel of technical details distributed through approved channels.
- Assist with confirmation/verification of information distributed through approved channels.
- Provide media at the EOC with approved the Licensee press releases.
- Assist Emergency Public Information personnel in rumor control and media monitoring.

15) {Commonwealth EOC Liaison(s)} {Commonwealth} EOC

At the request of {Commonwealth} officials and/or at the discretion of the {Emergency Director}, the Licensee will provide Liaison personnel to {Commonwealth} Emergency Operation Centers (EOCs). The {Commonwealth EOC Liaison(s)} use the {EOC Communicator} as their contact at the EOF. Responsibilities include:

- Monitor and report {Commonwealth} EOC activities to the EOF.
- Conduct briefings and answer questions as requested.

- Assist Emergency Public Information personnel in rumor control and media monitoring.

16) {Regulatory Liaison} EOF

The {Regulatory Liaison} reports to the {Administrative Support Manager}. Responsibilities include:

- Coordinate interfaces between the Licensee personnel and governmental agencies within the EOF.

- Obtain necessary equipment and supplies to support activities of governmental agencies located in the EOF.

c. Public Information Emergency Response Organization: The Public Information ERO is part of the overall Licensee ERO group that is activated during an emergency. It functions under the {Company Spokesperson} who reports to the {Emergency Director}.

The Public Information ERO consists of corporate and site personnel who are involved with emergency response efforts necessary to provide accurate information regarding the {BBNPP} emergency response efforts. This organization operates out of the Joint Information Center (JIC) and/or Emergency Operations Facility (EOF). Collectively, members of the Public Information ERO provide for the following activities during an emergency:

- Development and issuance of New Releases.
- Coordination and conduct of Media Briefings
- Rumor Control
- Media Monitoring and correction of mis-information

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

1) {Company Spokesperson} JIC

The {Company Spokesperson} reports to the {Emergency Director} and is responsible for directing the Licensee Public Information Emergency Response Organization and providing news information to the media. Responsibilities include:

- Maintain command and control of the Joint Information Center.

- Coordinate with Federal, {Commonwealth} and local agencies, as well as with other organizations involved in the emergency response, to maintain factual consistency of information to be conveyed to the news media/public.

- Conduct periodic briefings with the news media.
- Interface with the {Public Information Director}.
- Coordinate and direct responses to media inquiries.
- Ensure that the composition and timeliness of the Licensee News Releases are adequate.
- Provide for timely exchange of information between other spokespersons.

2) <u>{Technical Spokesperson} JIC</u>

The {Technical Spokesperson} reports to the {Company Spokesperson}. Responsibilities include:

- In coordination with the {Technical Advisor}, prepare briefing papers which contain additional detail and background not found in the news releases.
- Provide answers as soon as possible to media questions.
- Provide a follow-up explanation that corrects misinformation as soon as practicable.

3) <u>{Radiation Protection Spokesperson} JIC</u>

The {Radiation Protection Spokesperson} reports to the {Company Spokesperson}. Responsibilities include.

- In coordination with the {Radiological Advisor}, prepare briefing papers which contain additional detail and background not found in the news releases.
- Provide answers as soon as possible to media questions.
- Provide a follow-up explanation that corrects misinformation as soon as practicable.

4) <u>{JIC Director} JIC</u>

The {JIC Director} reports the {Company Spokesperson} to ensure the operability of and to supervise the activities in the JIC. Responsibilities include:

- Maintain cognizance of conditions of the plant and environment, and the actions of the Licensee and governmental support personnel.
- Coordinate with Federal, {Commonwealth} and local agencies, as well as with other organizations involved in the emergency response, to maintain factual consistency of information to be conveyed to the news media/public.
- Participate, as needed, in rumor control activities.

- Ensure that adequate information flow between the EOF and the JIC is coordinated through the {Public Information Director}.
- Authorize admittance of non-Licensee officials to the JIC.

5) {JIC Coordinator} JIC

The {JIC Coordinator} reports to the {JIC Director} and supervises the facilities support staff. Responsibilities include:

- Ensure the JIC is activated and operational. This includes the availability of communications and visual aids.
- Ensure that access to the JIC areas occupied by Licensee personnel is controlled.
- Establish a minimum frequency for addressing news media/public representatives and ensure that some form of communication occurs within that time frame (i.e., an update at least hourly.)
- Document unanswered questions and serious public misinformation issues. Follow-up on these questions and issues to ensure that they are being adequately addressed.
- Coordinate the interface between the Licensee and the news media/public, including, as necessary, briefings, news conferences, interviews and responses to information requests.

6) {Public Information Liaison} JIC

The {Public Information Liaison} reports to the {JIC Director}. Responsibilities include:

- Coordinate information flow between the EOF and JIC.
- Ensure that approved News Releases are made available in the JIC.

7) {JIC Administrative Manager} JIC

The {JIC Administrative Manager} reports to the {JIC Director}. Responsibilities include:

- Direct the clerical staff and ensure the clerical requirements for the other JIC staff are met.
- Coordinate shift relief and continual staffing for the JIC.
- Obtain additional radio and telephone equipment as necessary to meet the needs of the emergency.
- Obtain services as appropriate to support operation of the JIC.

8) {Access Control (Security)} JIC

{Access Control} reports to the {JIC Director} and is responsible for controlling facility access and obtaining authorization prior to admitting non-Licensee officials into the JIC.

9) {Public Information Director} JIC

When the Emergency Public Information Organization is activated, the {Public Information Director} reports to the {Company Spokesperson} and is responsible for all emergency event related information intended to be conveyed from the Licensee to the news media/public. The {Public Information Director} supervises the activities of the advisory staff, {News Writer} and media monitoring and rumor control personnel. Responsibilities include:

- Provide the {Emergency Director} with an overview of the public and media impacts resulting from the Licensee and governmental activities.
- Coordinate with the {Emergency Director} regarding information to be released to the public.
- Authorize the issuance of news releases.
- Interface with the {Company Spokesperson} at the JIC.
- Act as a liaison between the ERO and the Licensee’s corporate executives.
- Maintain cognizance of conditions of the plant and environment, and the actions of the Licensee and governmental support personnel.
- Interface with the {Public Information Liaison} located at the JIC and coordinate information flow between the EOF and the JIC.
- Coordinate with the {Media Monitoring Staff} to review and access media coverage of the emergency event.

10) {Technical Advisor} JIC

The {Technical Advisor} reports to the {Public Information Director}. Responsibilities include:

- Assist in obtaining technical and plant status information for use in news releases and media briefings.
- Assist the {News Writer} in the preparation of news releases.
- Assist the {News Writer} in the preparation of a chronological event description log.

11) {Radiological Advisor} JIC

The {Radiological Advisor} reports to the {Public Information Director}. Responsibilities include:

- Assist in obtaining environmental and health physics information for use in news releases and media briefings.
- Assist the {News Writer} in the preparation of news releases.
- Assist the {News Writer} in the preparation of a chronological event description log.

12) {News Writer} JIC

The {News Writer} reports to the {Public Information Director} Responsibilities include:

- Obtain the assistance of the {Technical and Radiological Advisors}, as needed, to develop news releases.
- Compose draft news releases.
- Provide the drafted news releases to the {Emergency Director} for technical review prior to {Public Information Director} approval.
- Develop a chronological event description log.
- Obtain the assistance of the {Technical and Radiological Advisors}, as needed, to develop the event log.

13) {Media Monitoring Staff} JIC

The {Media Monitoring Staff} reports to the {Public Information Director}. Responsibilities include:

- Ensure that the media is being monitored and that Licensee personnel review the information detailed or contained in media releases.
- Inform the {Public Information Director} of all media reports and of actions taken to correct any misinformation or rumors.
- Direct the activities of the {Rumor Control Staff} with respect to the function of monitoring rumors from sources other than the media.

14) {Rumor Control Staff} JIC

The {Rumor Control Staff} reports to the {Public Information Director} and acts in support of the {Media Monitoring Staff}. Responsibilities include:

- Ensure that rumors are reviewed, documented and responded to by Licensee personnel as deemed appropriate.

- Until the JIC is fully activated, document and respond to rumors as quickly as possible, through Communications and Public Affairs.
- Inform the {Media Monitoring Staff} when rumors representing serious misinformation are encountered.

The above listed ERO positions form the base of the Licensee emergency response, all company personnel and resources can and will be utilized to ensure the safety of offsite populations, site personnel and protection of site equipment needed to maintain nuclear safety.

6. Emergency Response Organization Block Diagram

Tables B-1a (located in the Unit Annex) and B-1b list the key positions of the ERO and the supporting positions assigned to interface with federal, {Commonwealth}, and local authorities. Figures B-1a through B-1d illustrates the overall ERO. Section B.5 discusses specific responsibilities and the interrelationships for key positions.

7. Corporate Emergency Response Organization

Corporate management personnel are part of the Offsite ERO and the Emergency Public Information Organization. Personnel staffing these organizations are covered in detail in Section B.5 of this plan.

In addition to corporate management personnel acting as part of the ERO, the Licensee will provide necessary company resources to aid the site with the following items:

a. Logistics support for emergency personnel, including procurement of transportation, communications, lodging, meals and any other special needs to ensure ongoing staffing of emergency facilities.

b. Arrangements for technical support and necessary resources for reentry/recovery operations.

c. Interface with high level government authorities, not normally part of emergency response activities.

d. Assistance in release of information to the news media.

8. Industry/Private Support Organizations

The Licensee retains contractors to provide supporting services to nuclear generating sites. A contract/purchase order with a private contractor is acceptable in lieu of an agreement letter for the specified duration of the contract. Among services currently provided are the following:

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

- Assistance to the affected licensee in locating sources of emergency personnel, equipment and operational analysis.
- INPO, Electric Power Research Institute (EPRI) and Nuclear Energy Institute (NEI) maintain a coordination agreement on emergency information with their member utilities.
- INPO provides the "Nuclear Network", or its replacement, electronic communications system to its members, participants, NEI, and EPRI to coordinate the flow of media and technical information about the emergency.
- The Licensee may obtain industry information and assistance from any party to this agreement through the coordination of INPO.

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

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

The Licensee will notify INPO (via the designated emergency call number) for all situations involving an Alert, Site Area Emergency, or General Emergency declaration per the {BBNPP} reportability procedures.

INPO has coordinated the preparation of a Voluntary Assistance Agreement for Transportation Accidents. The Licensee has signed this agreement which establishes the rights and responsibilities of electric utilities in requesting or providing assistance for response to a nuclear materials Transportation Accident.

b. Nuclear Energy Institute (NEI): NEI may assist with public information efforts during a declared emergency.

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

- ANI/MAELU Emergency Assistance: In the event of an extraordinary nuclear occurrence (as defined in the Price-Anderson Law) ANI and MAELU (the insurance pools) have plans prepared to provide prompt emergency funding to affected members of the public.

- ANI/MAELU Emergency Assistance (Claims Handling Procedures): The pools' emergency assistance arrangements contemplate the mobilization and dispatch of emergency claims teams to directly dispense emergency assistance funds to affected members of the public.

  The pools should be notified in the event of a nuclear emergency requiring notification of {Commonwealth} or Federal governmental agencies, or if the insured believes that offsite persons may be affected and financial assistance of a nature discussed may be required. In these instances, ANI expects notification as soon as possible after the initiation of the emergency. Notification to the pools in the event of an Alert, Site Area Emergency, or General Emergency will be in accordance with the Site's notification procedures.

  Even if it appears to be remote that offsite persons will be affected, the pools should be notified in order that response plans can be initiated to the point of alerting teams of adjusters to stand by. Response activity can be discontinued if it proves less severe and does not require pool response.

  All nuclear occurrences of an emergency or non-emergency nature that fall under the nuclear liability policy should be reported formally in writing to ANI by the Licensee.

- Emergency Notification and Follow-up Procedures: Pre-established lines of communication exist between each licensee and ANI in order to exchange all required information during a developing emergency situation.

  ANI maintains 24-hour coverage of an emergency notification number. During normal office hours (8:00 am - 4:00 pm) their number will be answered by the receptionist who will transfer an incoming emergency call to an appropriate individual in the office. Outside of normal office hours, this telephone line is covered by an answering service. The answering service will intercept the call and obtain the name, affiliation and telephone number of the caller. They will then notify a designated ANI staff member who will in turn call back the licensee to obtain appropriate information regarding the nuclear accident.

In order that follow-up information is available to the Insurance Pool, the Licensee has established the {Emergency Director} or their designee as a Point of Contact that ANI personnel may use to update themselves regarding the status of the emergency.

d. Environmental Monitoring Services:

{Radiological analytical services are provided by the sites environmental lab. They provide radiological environmental monitoring services in support of the site emergency Radiological Environmental Monitoring Programs (REMPs). In an emergency situation, SSES Laboratories, at a minimum, could be used to analysis BBNPP air samplers and exchange TLDs under the supervision of the Environmental Assessment Director. Laboratories at these facilities would analyze the environmental samples for their radioactivity content and report results to BBNPP. Arrangements may also be contracted for services from outside commercial laboratories.}

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

f. Manufacturer Design and Engineering Support: Under established contracts, {AREVA} provides design engineering expertise, specialized equipment and other services identified as needed and deemed appropriate to assist in an emergency situation.

9. Supplemental Emergency Assistance to the ERO

Agreements are maintained with outside support agencies who do not take part in the organizational control of the emergency that provide assistance when called on during an emergency or during the recovery phase. These agreements identify the emergency measures to be provided, the mutually accepted criteria for implementation, and the arrangements for exchange of information. These support agencies (named in Appendix 3) provide services of:

a. Law enforcement;

b. Fire protection;

c. Ambulance services;

d. Medical and hospital support

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

Table B-1b: Minimum Staffing Requirements for the {BBNPP} ERO

Functional Area	Major Tasks	Emergency Positions	Minimum Staffing *60{/90} Minute Augmentation	Other On-Call	Full Augmentation
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	See Table B-1a (located in Unit Specific Annexes) for Shift Staffing. (e)			
2. Emergency Direction and Control	Command and Control	{Shift Supervisor (Interim ED)}(e) (CR)			
		{Emergency Plant Manager} (TSC)	1		
		{Emergency Director} (EOF)	1		
3. Notification & Communication	Emergency Communications	Plant Shift Personnel (e)			
		{TSC Director} (TSC)	1		
		{EOF Director} (EOF)	1		
		{TSC/EOF Communicators}:			
		{ENS Communicator} (TSC)	1		
		{HPN Communicator} (EOF)	1		
		{Commonwealth/Local Communicator} (EOF)			1
	Plant Status	{OPs Communicator} (CR/TSC)			2
	Technical Activities	{Operations Advisor} (EOF)			1
	In-Plant Team Control	{Communicator} (CR/TSC/OSC)			3(a)
	Governmental	{EOC Communicator} (EOF)			(b)
		{Commonwealth EOC Liaison}			1
		(Commonwealth EOC)			(b)
		{County EOC Liaison} (County EOC)			1
		{Regulatory Liaison} (EOF)			
4. Radiological Assessment	Offsite Dose Assessment	Plant Shift Personnel (e)			
		{Rad Assessment Coordinator} (EOF)	1		
		{Rad Assessment Specialist} (EOF)			1
		{Rad Controls Coordinator} (OSC)			1
	Offsite Surveys	{Environmental Assessment Dir} (EOF)	1		
		Offsite Monitoring Team Personnel	4		1(b)
	Onsite Surveys	Onsite Monitoring Team Personnel	2		(b)
	In-plant Surveys	RP Personnel (e)	2		(b)
	Chemistry	Chemistry Personnel (e)	1		(b)
	RP Supervisory	{Radiation Protection Manager} (TSC)	1		
		{Rad Assessment Director} (EOF)	1		

Functional Area	Major Tasks	Emergency Positions	Minimum Staffing *60{/90} Minute Augmentation	Minimum Staffing Other On-Call	Full Augmentation
5. Plant System Engineering, Repair, and Corrective Actions	Technical Support / Accident Analysis	{Shift Technical Advisor} (e) (CR)			
		{Engineering Director} (TSC)	1		
		{Reactor Engineer} (TSC)	1		
		{Mechanical Engineer} (TSC)	1		
		{Electrical Engineer} (TSC)	1		
		{Operations Manager} (TSC)	1		
		{Radiation Controls Engineer} (TSC)			1
		{Technical Support Manager} (EOF)			1
	Repair and Corrective Actions	Mechanical Maintenance (OSC)	2		(b)
		Electrical/I&C Maintenance (OSC)	3		(b)
		{Maintenance Manager} (TSC)	1		
		{OSC Director} (OSC)	1		
		{OSC Leads (f) & Team Members}(OSC)			(b)
6. In-Plant Protective Actions	Radiation Protection	RP Personnel (e)	4		(b)
7. Fire Fighting	--	Fire Brigade			(c)
8. 1st Aid and Rescue Operations	--	Plant Personnel			(b)
9. Site Access Control and Personnel Accountability	Security & Accountability	Security Team Personnel	(d)		
		{Security Coordinator} (TSC)			1
10. Resource Allocation and Administration	Logistics	{Administrative Support Manager}(EOF)	1		
		{Administrative Support Manager}(TSC)			1
	Administration	Clerical Staff (TSC/EOF)			1(b)
	Facility Support	Computer Support(g) (EOF)			1

Functional Area	Major Tasks	Emergency Positions		Minimum Staffing *60{/90} Minute Augmentation	Minimum Staffing Other On-Call	Full Augmentation
11. Public Information	Media Interface	{Company Spokesperson}	(JIC)		1	
		{Rad Protection Spokesperson}	(JIC)			1
		{Technical Spokesperson}	(JIC)			1
	Information Development	{Public Information Director}	(JIC)		1	
		{Radiological Advisor}	(JIC)			1
		{Technical Advisor}	(JIC)			1
		{News Writer}	(JIC)			1
		{Public Information Liaison}	(JIC)			1
	Media Monitoring and Rumor Control	{Media Monitoring Staff}	(JIC)			(b)
		{Rumor Control Staff}	(JIC)			(b)
	Facility Operation and Control	{JIC Director}	(JIC)		1	
		{JIC Coordinator}	(JIC)			1
		{JIC Administrative Manager}	(JIC)			1
		{Access Control}	(JIC)			1
		Facility Support Staff	(JIC)			(b)
		Clerical Staff				(b)
			TOTAL:	**36**	**3**	**27[(b)]**

* Response time is based on optimum travel conditions. {90 minute augmentation for EOF responders.}

(a) May be provided by personnel assigned other functions.

(b) Personnel numbers depend on the type and extent of the emergency.

(c) Fire Brigade per FSAR/Technical Specifications, as applicable.

(d) Per Security Plan.

(e) All Shift ERO positions are listed in Table B-1a, contained in unit specific annexes.

(f) {OSC Team Leads} can be used to fill technical/craft positions in Maintenance, RP and Chemistry.

(g) The staff assigned to {Computer Support} may be dispatched to any facility to assist with computer/communications equipment issues.

Figure B-1a: Overall ERO Command Structure

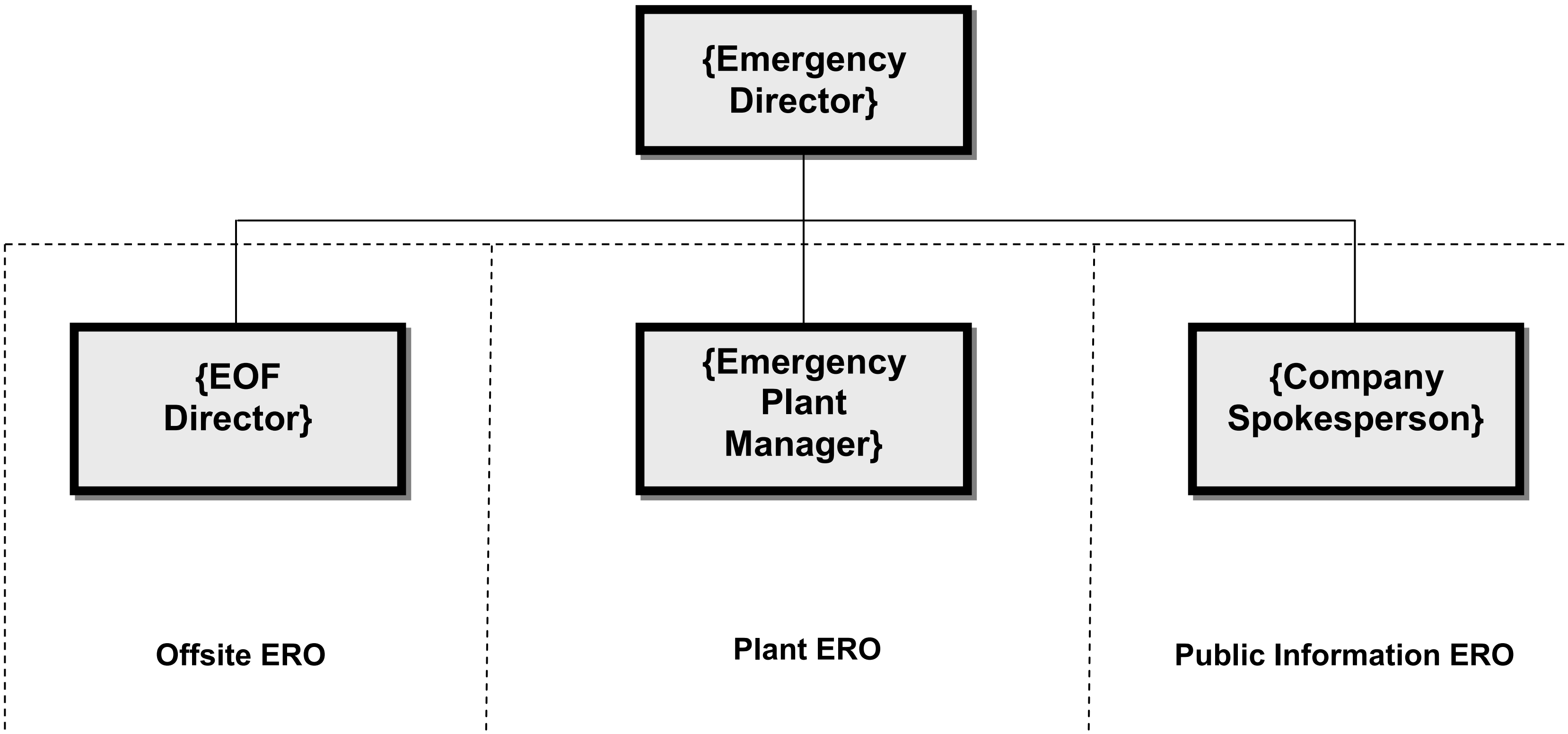
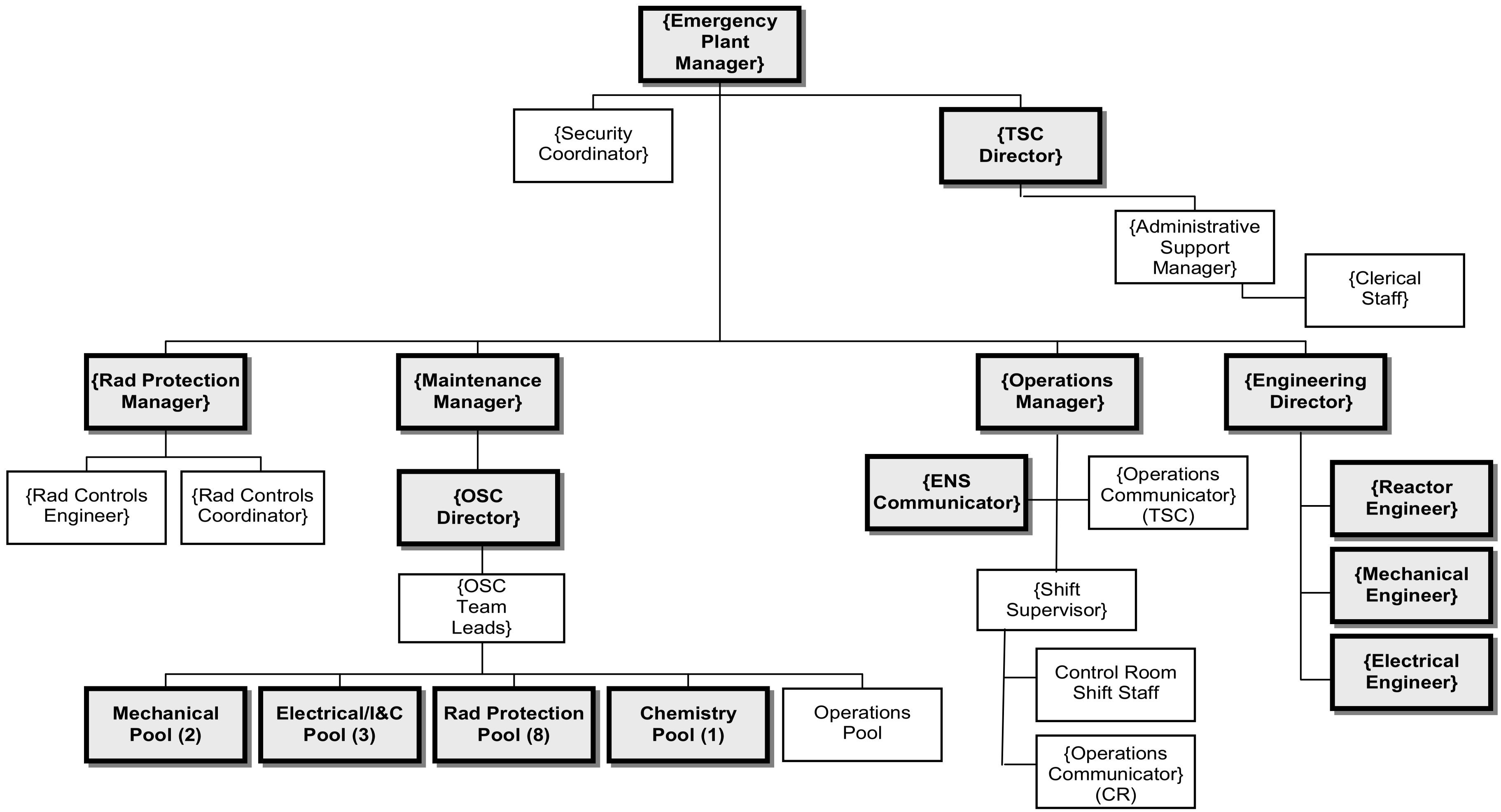


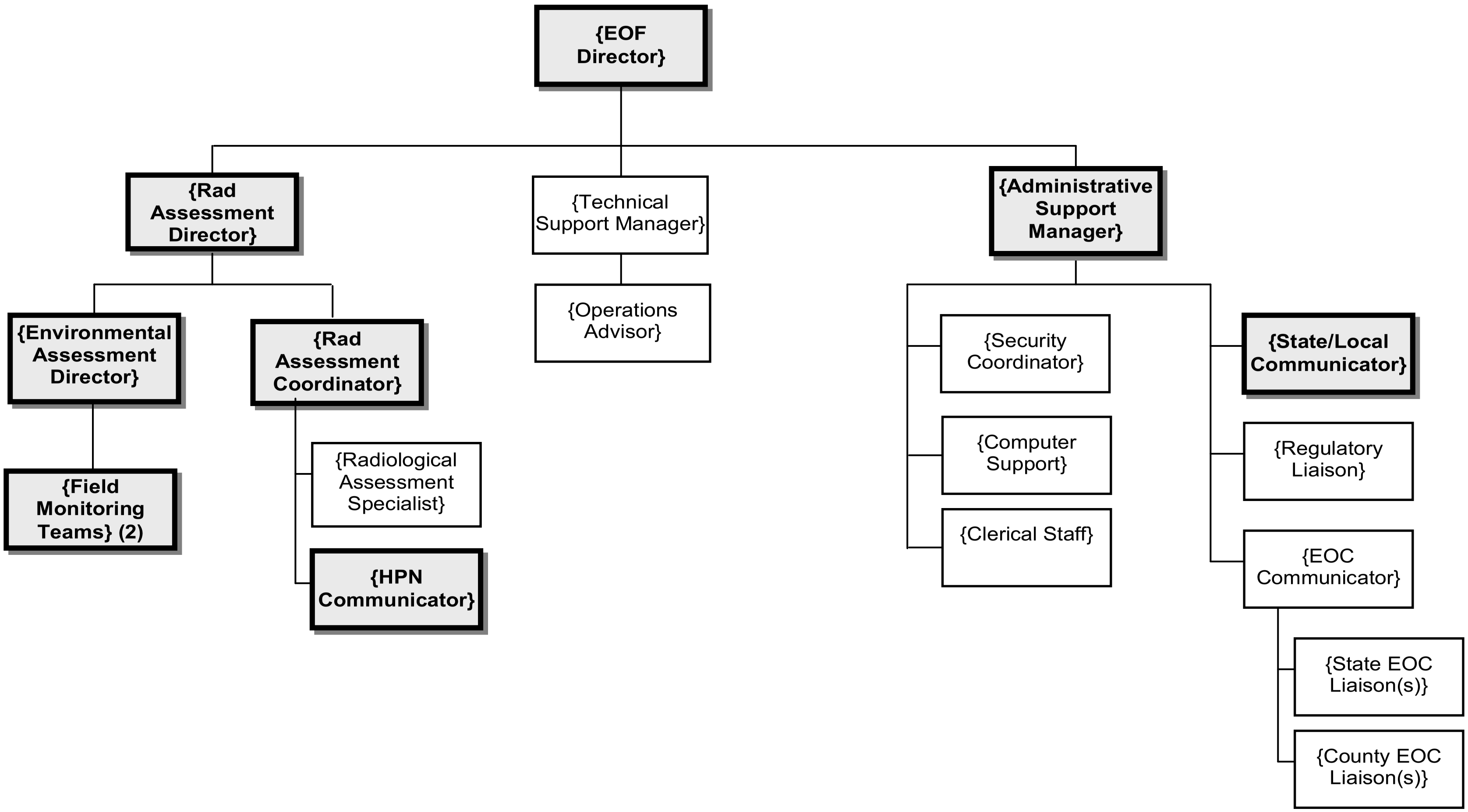
Figure B-1b: Emergency Onsite Organization



Shaded/Bold Boxes indicate minimum staffing positions.

ERO response pool personnel do not include the on-shift complement.

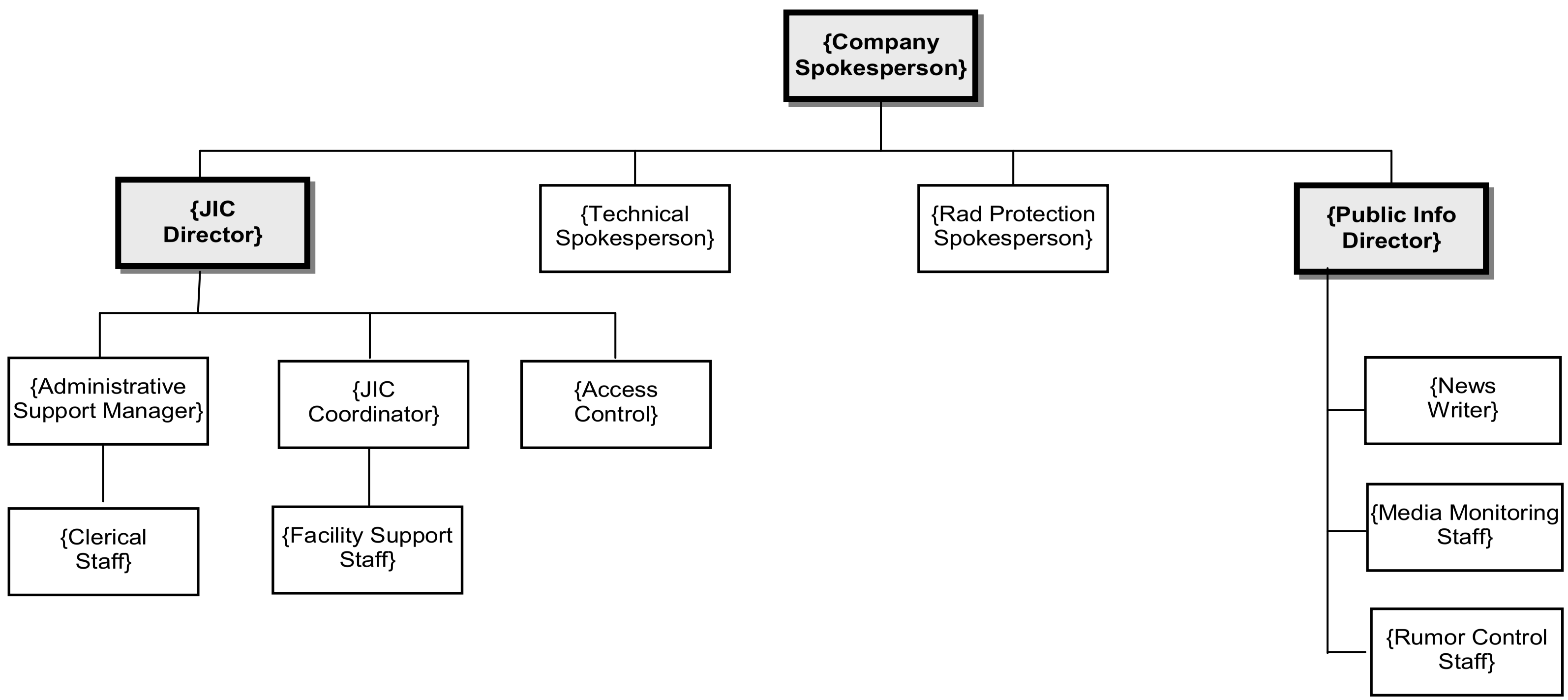
Figure B-1c: Emergency Offsite Organization



Shaded/Bold Boxes indicate minimum staffing positions.

ERO response pool personnel do not include the on-shift complement.

Figure B-1d: Emergency Public Information Organization



Shaded/Bold Boxes indicate minimum staffing positions.

ERO response pool personnel do not include the on-shift complement.

Section C: Emergency Response Support and Resources

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

1. Federal Response Support and Resources

Assistance is available from federal agencies through the National Response Plan (NRP). The lead federal agency who provides direct assistance to the Licensee during an emergency is the Nuclear Regulatory Commission (NRC). Other federal agencies, such as the Federal Emergency Management Agency (FEMA) and the Department of Energy (DOE), provide assistance to the {Commonwealth} through implementation of the NRP.

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

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

c. Each emergency response facility has the equipment and communications capability necessary for a continuous high level of response, interaction, and communication among key personnel during emergency conditions. The emergency facilities are able to accommodate federal representatives with working areas provided for their use. Accommodations for the expected site response teams assume the following approximate numbers for each facility:

Facility	Accommodations
EOF	16
TSC	5
CR	1
JIC	10

2. Liaisons

a. The NRC, FEMA, and the {Commonwealth} may dispatch representatives to the EOF where accommodations have been provided.

b. At the Alert level and above, Licensee personnel may be assigned as liaisons to the requesting {Commonwealth} and/or county/city/town Emergency Operations Center (EOCs). These representatives act as technical liaisons to interpret emergency action levels and protective action recommendations made by the Plant's ERO.

3. Radiological Laboratories

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

Additional facilities for counting and analyzing samples can be provided by contracted laboratory services or arrangements with other nuclear facilities. These laboratories can act as backup facilities in the event that the plant's counting room and laboratory become unusable or the offsite radiological monitoring and environmental sampling operation exceeds the capacity of the site capabilities during an emergency. Additional outside analytical assistance may be requested from {Commonwealth} and federal agencies.

The laboratories have the capability of analyzing terrestrial, marine, and air samples. Their common instrumentation includes a multi-channel analyzer used to determine the isotopic content in a sample, a liquid scintillation counter for tritium analyses, and gas proportional counter for gross alpha, and gross beta activity.

4. Other Assistance

Through INPO other companies operating nuclear facilities are available to provide certain types of assistance and support, including technicians, engineering, design, consultation, whole body counting, and dosimetry evaluation and equipment. Additional facilities, organizations, and individuals, as listed in the Emergency Telephone Directory, are available and may be used in support of emergency response. In addition, American Nuclear Insurers (ANI) provides insurance to cover the Licensee legal liability up to the limits imposed by the Price-Anderson Act, for bodily injury and/or property damage caused by the nuclear energy hazard resulting from an incident at the plant. Written agreements which describe the level of assistance and resources provided to the Licensee by external sources are included in Appendix 3 as applicable.

Section D: Emergency Classification System

This section describes the classification and emergency action level scheme used to determine the minimum response to an abnormal event at the site. This scheme is based on plant systems, effluent parameters, and operating procedures. The initial response of federal, {Commonwealth}, and local agencies is dependent upon information provided by the ERO. The plant's Emergency Preparedness Staff works closely with the {Commonwealth} and local agencies to ensure consistency in classification schemes and procedural interfaces.

1. Emergency Classification System

The E-Plan provides for classification of emergencies into four (4) categories or conditions, covering the postulated spectrum of emergency situations. They are: Notification of Unusual Event (referred to as Unusual Event), Alert, Site Area Emergency, and General Emergency. Each classification is characterized by Emergency Action Levels (EALs) or event initiating conditions and address emergencies of increasing severity.

a. Unusual Event - Events are in progress 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 release of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

This is the least severe of the four (4) levels. The purpose of this classification is to bring response personnel and offsite agencies to a {Commonwealth} of readiness in the event the situation degrades and to provide systematic handling of information and decision making. The {Shift Supervisor}, as {Interim Emergency Director} will classify an Unusual Event.

Required actions at this classification include:

- Notifications to site management.
- Notification, within 15 minutes, of the {Commonwealth} and local communities.
- At the discretion of the {Emergency Director} or site management, full or selective staffing of the TSC, OSC and EOF may be initiated.
- Notification of the Nuclear Regulatory Commission (NRC) as soon as possible but within 60 minutes of classification.
- Assessment of the situation and response as necessary, which may include escalating to a higher classification if conditions warrant.

- When the event is terminated, close-out is performed over communication links to offsite authorities participating in the response (i.e., NRC, {Commonwealth}, local), followed by formal transmission of a {Commonwealth}/local notification form within 24 hours.

b. Alert - 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 EPA Protective Action Guideline exposure levels.

The purpose of this classification is to ensure that emergency response personnel are readily available and to provide offsite authorities with current status information. An Alert will be classified as the initiating event or as escalation from an Unusual Event. In either case, the classification will most likely made by the {Shift Supervisor} ({Interim Emergency Director}) prior to the transfer of Command and Control.

Required actions at this classification include:

- Notifications to site management.
- Notification, within 15 minutes, of the {Commonwealth} and local communities. The EOF will assume {Commonwealth} update responsibilities.
- Activation of the TSC, OSC and the EOF. The JIC organization may be activated at the Alert level.
- Transfer of Command and Control.
- Notification of the NRC as soon as possible but within 60 minutes of classification.
- Notification of INPO and ANI.
- Assessment of the situation and response as necessary, which may include escalating to a higher classification if conditions warrant.
- On-site and off-site Monitoring Teams are sent to staging areas or dispatched to monitor for releases of radiation to the environment.
- Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological and radiological data.
- When the event is terminated, notification is performed over communication links followed by an Initial Incident Report to offsite authorities participating in the response (i.e., NRC, {Commonwealth}, local) within 8 hours.

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

The purpose of this classification, in addition to those of the Alert level, is to ensure that all emergency response centers are manned and provisions are made for information updates to the public through offsite authorities and the news media. The classification will most likely be made by the {Emergency Plant Manager} following activation of the TSC.

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

- Activation of the JIC.
- If not previously performed, Assembly/Accountability shall be performed and Site Evacuation of non-essential personnel shall be initiated.
- Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological data and projected or actual doses for any releases that have occurred.

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

The purpose of this classification, in addition to those of the Site Area Emergency level, is to initiate predetermined protective actions for the public and provide continuous assessment of information from monitoring groups. The classification will most likely be made by the {Emergency Plant Manager} following activation of the TSC.

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

- A Protective Action Recommendation will be determined.
- Assessment of the situation and response as necessary.

e. {Classification Downgrading: The Licensee policy is that emergency classifications shall not be downgraded to a lower classification. Once declared, the event shall remain in effect until no Classification is warranted, a higher classification is required or until such time as conditions warrant termination and entry into the Recovery Phase.}

f. Guidance for Termination of an Emergency: The purpose of terminating an emergency is to provide an orderly turnover of plant control from the Emergency Response Organizations to the normal {BBNPP} plant organization. Termination of the emergency is authorized by the {Emergency Director} in Command and Control. The considerations discussed in Section M.1.b must be performed prior to exiting the emergency event. Consultation with governmental agencies and other parties should be conducted prior to termination of an event classified as Site Area or General Emergency. Notifications shall be transmitted to appropriate agencies to terminate an event. When an event classified at an Alert or higher is terminated a Recovery Phase will be entered.

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

   Entry into the Recovery Phase will be authorized by the {Emergency Director} after consultation with the {Emergency Plant Manager} and offsite authorities.

   Required actions for Recovery include:

   - The affected {Commonwealth(s)} and the NRC should be consulted prior to entry into Recovery.
   - Notifications will be made to site management, {Commonwealth(s)}, local authorities and the NRC.
   - A Recovery organization will be established to manage repairs to return the Unit to an acceptable condition, and support environmental monitoring activities as requested in coordination with Federal and {Commonwealth} efforts.
   - INPO and ANI are notified of Recovery phase.

g. Nuclear Security Plan: {BBNPP} has a Security Plan that complies with the requirements of 10 CFR 73. The interface between the E-Plan and the Security Plan is one of parallel operation. The plans are compatible. The E-Plan response measures, once initiated, are executed in parallel with measures taken in accordance with the Security Plan. During a classified event the individual in overall command and control has responsibility for both operations.

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

The assessment of any security contingency event and the decision to initiate, or not to implement the E-Plan, will be the responsibility of the {Shift Supervisor} or {Emergency Plant Manager}. All identified security contingency events have the potential of being assessed as initiating conditions for a radiological emergency declaration.

Determination of a credible security threat may require the staffing of emergency response facilities based on the classification of an Unusual Event per the Emergency Action Levels (EALs).

2. Emergency Action Levels

The {BBNPP} Annex includes Unit Specific Emergency Action Levels (EALs) consistent with the general class descriptions and provided in NEI guidance documentation in accordance with Regulatory Guide 1.101, “Emergency Planning and Preparedness for Nuclear Power Reactors.” Where possible, these EALs will be related to plant instrumentation readings.

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

EALs are for unplanned events. A planned evolution involves preplanning to address the limitations imposed by the condition, the performance of required surveillance testing, and the implementation of specific controls prior to knowingly entering the condition. Planned evolutions to test, manipulate, repair, perform maintenance or modifications to systems and equipment that result in an EAL Threshold Value being met or exceeded are not subject to classification and activation requirements as long as the evolution proceeds as planned. However, these conditions may be subject to the reporting requirements of 10 CFR 50.72 and/or 10 CFR 50.73.

An emergency is classified after assessing abnormal plant conditions and comparing them to EAL Threshold Values for the appropriate Initiating Conditions. Classifications are based on the evaluation of each unit for multi-reactor sites. Matrix tables organized by recognition categories are used to facilitate the comparison. The matrix tables are used when the unit is in the Technical Specification defined modes of Power Operations (for classifications purposes, startup evolutions are included in the Power Operations mode), Hot Standby, Hot Shutdown and Cold Shutdown or Refueling (for classification purposes a defueled plant will be considered in the Refueling mode).

All recognition categories are reviewed for applicability prior to classification. The initiating conditions are coded with a letter and/or number designator. All initiating conditions, which describe the severity of a common condition (series), have the same initial designator.

3. Offsite Classification Systems

The Licensee works with the {Commonwealth} to ensure consistency between classification schemes. The initial EALs will be discussed with and agreed upon by the {Commonwealth} and local authorities and approved by the NRC. Thereafter, the content of the EALs shall be reviewed with the {Commonwealth} and local authorities on an {annual basis} and significant changes approved by the NRC. Concurrence is obtained from {Commonwealth} and local authorities for EAL changes that significantly impact the Initiating Conditions or technical bases.

4. Offsite Emergency Procedures

The Licensee works with the {Commonwealth} and local authorities to ensure that procedures are in place that provide for emergency actions to be taken which are consistent with the protective actions recommended by the site, accounting for local offsite conditions that exist at the time of the emergency.

Section E: Notification Methods and Procedures

This section describes the notification of {Commonwealth} and local response organizations and {BBNPP} emergency response personnel. It outlines the content of initial and follow-up messages to response organizations within the Plume Exposure Pathway Emergency Planning Zone (EPZ).

1. Bases for Emergency Response Organization Notification

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

<u>Notification/Classification for Multi-Unit Emergencies:</u> when the classification involves multi-units of a multi-unit facility (i.e., tornado or earthquake), the classification shall be reported as affecting all units.

In situations when multiple units of a multi-unit facility are affected by emergency events, but the events are not related or the classification for each unit is different, notification will be made for the highest classification. Clarification of the relationship between the classification levels determined for the units should be provided in the periodic {Commonwealth} and NRC updates.

In situations when one unit is affected by unrelated events, notification will be made for the highest classification via the {Commonwealth}/Local notification and the second event information provided in the periodic {Commonwealth} updates.

<u>Notification for Transportation Accidents:</u> A Transportation Accident is defined in 49 CFR 171.15 and 49 CFR 171.16. If a Transportation Accident involving material in the custody of {BBNPP} occurs, the Licensee will notify the appropriate internal and offsite agencies in accordance with Licensee procedures.

2. Notification and Mobilization of Emergency Response Personnel

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

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

At the Unusual Event classification, select ERO augmentation personnel are notified and requested to remain available to respond. At an Alert classification or higher ERO augmentation personnel are notified for activation of the TSC, OSC, EOF, and, if determined appropriate, the JIC using the ERO notification system or via established back-up methods. The JIC is activated at the Site Area Emergency.

b. Offsite: Notifications are promptly made to offsite emergency response organizations as follows:

1) {Commonwealth} / Local Agencies: A notification shall be made within fifteen (15) minutes of:

- The initial emergency classification.
- Classification escalation.
- The issuance of or change to a Protective Action Recommendation (PAR) for the general public.
- Changes in radiological release status, occurring outside of an event classification or PAR notification, based on an agreement with the {Commonwealth}.

The {Commonwealth} / local emergency warning points are notified using a dedicated notification system, or a commercial telephone line as backup. If the dedicated system is not used procedures will provide for a message authentication process.

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

2) Nuclear Regulatory Commission (NRC): An event will be reported to the NRC Operations Center immediately after notification of the appropriate {Commonwealth} or local agencies but not later than one (1) hour after the time of initial classification, escalation, termination or entry into the Recovery Phase. The NRC is notified by a dedicated telephone system called the Emergency Notification System (ENS). If the ENS is inoperative, the required notifications are made via commercial telephone service, other dedicated telephone service, or any other method that shall ensure that a report is made as soon as practical.

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

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

Mobilization of federal, {Commonwealth}, and local response organizations is performed in accordance with their applicable emergency plan and procedures. At a minimum, mobilization of federal response organizations and activation of {Commonwealth} and local EOCs is expected to occur at the declaration of a Site Area Emergency.

The {Commonwealth} and local authorities are responsible for the process of notification of the general public.

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

- Medical, rescue, and fire fighting support services are notified for assistance as the situation dictates.
- The Institute of Nuclear Power Operations (INPO) is notified at an Alert or higher classification with requests for assistance as necessary.
- The American Nuclear Insurers (ANI) are notified at an Alert or higher classification with requests for assistance as necessary.
- Vendor and contractor support services are notified for assistance as the situation dictates.

3. Initial Notification Messages

The Licensee, in conjunction with {Commonwealth} and local authorities, has established the contents of the initial notification message form transmitted during a classified emergency. The contents of the form include, as a minimum:

- Designation ("This is a Drill" or "Actual Event").
- Identity of site.
- Event classification and nature of incident.
- EAL number.
- Non-technical event description (as agreed upon with {Commonwealth} authorities).
- Date and time of declaration {(or entry into Recovery Phase or Termination)}.
- Whether a release is taking place (Note: “Release” means a radiological release attributable to the emergency event.)

- Wind direction and speed.
- Whether offsite protective measures may be necessary.
- Potentially affected {population and areas} (or Sectors as applicable) when a General Emergency is declared.

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

4. Follow-up Messages

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

Follow-up notifications are provided to the NRC Operations Center as soon as possible, but not later than one (1) hour after significant new information is available involving:

a. location of incident and name and telephone number (or communications channel identification) of caller;

b. date/time of incident;

c. class of emergency;

d. type of actual or projected release (airborne, waterborne, surface spill), and estimated duration/impact times;

e. estimate of quantity of radioactive material released or being released and the points and height of releases;

f. chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodines and particulates;

g. meteorological conditions at appropriate levels (wind speed, direction (to and from), indicator of stability, precipitation, if any);

h. actual or projected dose rates at site boundary; projected integrated dose at site boundary;

i. projected dose rates and integrated dose at the projected peak and at 2, 5 and 10 miles (3.2, 8, and 16 kilometers), including sector(s) affected;

j. estimate of any surface radioactive contamination in plant, onsite or offsite;

k. licensee emergency response actions underway;

l. recommended emergency actions, including protective measures;

m. request for any needed onsite support by offsite organizations; and

n. prognosis for worsening or termination of event based on plant information.

If requested by the NRC, an open, continuous communications channel will be maintained with the NRC Operations Center over the Emergency Notification System (ENS) and/or Health Physics Network (HPN) Circuits.

5. {Commonwealth} and County Information Dissemination

The {Commonwealth} and local emergency response plans describe procedures for {Commonwealth} and local officials to make a public notification decision promptly (within about 15 minutes) on being informed by the plant of an emergency. The system for disseminating information to the public includes notification by pre-scripted messages through appropriate broadcast media such as the Emergency Alert System (EAS).

6. Notification of the Public

The capability exists for the prompt notification of the general public within the Plume Exposure Pathway Emergency Planning Zones (EPZs) for the Licensee sites covered under this plan.

This notification capability consists of two principal elements: (1) the {Public Notification Systems (PNS)} and (2) the Emergency Alerting System (EAS) radio stations.

- The {Public Notification System (PNS)} consists of fixed sirens. It may also include subsystems such as Tone Alert Radios, Reverse 911 Calling and vehicles with public address (PA) systems {and the Emergency Alert System}. Activation of the {PNS} sirens by the civil authorities will alert the public to turn on their radios to a local EAS radio station for detailed information on the emergency situation.

- The Emergency Alerting System (EAS) is a network of local radio stations prepared to transmit or relay emergency information and instructions from the civil authorities to the general public

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

{The activation of the PNS sirens and operation of the system is discussed in detail in the Commonwealth specific response plans.}

7. Messages to the Public

The {Commonwealth and counties} have developed EAS messages for the public consistent with the classification scheme. These draft messages are included as part of the {Commonwealths'} Emergency Plan and contain instructions with regard to specific protective actions to be taken by occupants and visitors of affected areas. Messages may include instructions such as: take shelter and go indoors, close windows and doors, turn off ventilation systems; directions given for evacuation; directions to stay tuned to specific stations for further information, ad-hoc respiratory protection, (e.g., handkerchief over mouth, etc.). The Licensee will provide support for the content of these messages when requested.

Section F: Emergency Communications

This section describes the provisions utilized for prompt communications among principal emergency response organizations, communications with the ERO and communications with the general public.

1. Communications/Notifications

The Licensee has extensive and reliable communication systems installed at {BBNPP}. Examples of the communications network include systems such as normal and dedicated telephone lines on landlines, microwave and fiber-optic voice channels, cell phones, satellite phones, base and mobile radio units, and computer peripherals. This network provides:

- Voice communication through normal telephone, dedicated line and automatic ring-down between selected facilities, conference call capability, speaker phones, and operator assistance where required.
- Communications between emergency vehicles and appropriate fixed locations, as well as with {Commonwealth} mobile units and fixed locations.
- Facsimile, computer network, and modem transmission.

Figure F-1 depicts the initial notification paths and the organizational titles from the Licensee Emergency Response Facilities (ERFs) to federal, {Commonwealth} and local emergency response organizations, and industry support agencies. The primary and alternate methods of communication, and the NRC communications network, are illustrated on Figures F-2 and F-3.

a. The Licensee maintains the capability to make initial notifications to the designated offsite agencies on a 24-hour per day basis. The offsite notification system provides communications to {Commonwealth} and local warning points and Emergency Operations Centers from the CR, TSC, and EOF. Backup methods include facsimile and commercial telephone lines. {Commonwealth} and local warning points are continuously staffed.

b-d. The Licensee has established several communication systems that ensure reliable and timely exchange of information necessary to provide effective Command and Control over any emergency response; (1) between the site and {Commonwealth} and local agencies within the EPZs, (2) with federal emergency response organizations, (3) between the plant, the EOF, and the {Commonwealth} and local EOCs, and (4) between Emergency Response Facilities and Monitoring Teams. A general description of the systems is as follows:

1) <u>{Centrex Telephone Network (CTN)}:</u> The {CTN} is a dedicated communications system that has been installed for the purpose of notifying {Commonwealth} and local authorities of declared nuclear emergencies. This system links together the {BBNPP}' Control Room(s), the EOF, TSC(s) and {Commonwealth} and local authorities as appropriate.

2) Dedicated Phone Lines: A dedicated phone link is established by limiting a phone line to one purpose, blocking its use for all other purposes. Several dedicated telephone links have been established for use by the ERO to perform the following key communications tasks. Some of these tasks are listed below:

- {Communications between the Control Room, the TSC and/or the OSC to coordinate the dispatching of emergency damage control teams from the OSC (see Figure F-2).}

- {Communications between the Control Room, the TSC and the EOF to monitor the activities of the Control Room staff and provide technical data to facilities outside the Control Room (see Figure F-2).}

- {Conferencing between the TSC and the EOF to communicate mitigating activities and priorities for the site to the EOF (see Figure F-2).}

- {Communications between {Emergency Director}, the Control Room, TSC, and the EOF (see Figure F-2).}

3) Private Branch Exchange (PBX) Telephone System: The PBX telephone system provides communication capability between telephones located within the plant. The PBX is used to connect the CR, TSC, EOF, and OSC. The PBX telephone system also provides for outside communications through interconnections with the corporate telephone communications system and commercial telephone lines.

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

5) Emergency Response Data System (ERDS): The ERDS will supply the NRC with selected plant data points on a near real time basis. ERDS is activated by the ERO as soon as possible but not later than one hour after declaration of an Alert, Site Area Emergency or General Emergency. The selected data points are transmitted via modem to the NRC at approximately 1-minute intervals. {A similar system is available to provide key plant parameter data to the Commonwealth of Pennsylvania.}

6) Monitoring Team Communications: A separate communications system has been installed to allow coordinated environmental monitoring and assessment during an emergency. This system consists of the necessary hardware to allow communication between the {Control Room, TSC, EOF, and mobile units} in the monitoring team vehicles. Commercial cell phones or other means are available as back up to the primary monitoring team communications system.

In addition, site communication links exist to ensure appropriate information transfer capabilities during an emergency. The site may also utilize its Public Address System, {Video Conferencing Systems}, site radios and pagers to augment its emergency communications.

e. ERO Notification System: The Licensee utilizes an automated ERO notification system to rapidly notify members of the ERO. The system consists of a computer with modem equipment capable of initiating and receiving telephone calls. When contact is made, the system automatically requests security identification and then responds. One of the calls made by the system is to the paging system vendor. The pager vendor's system accepts group and individual numbers from the ERO notification system, activating several radio transmitters which, in turn, activate personal pagers belonging to members of the ERO. Implementing procedures specify the course of action to be taken if the ERO notification system fails. In this situation, these procedures require site personnel to manually activate the ERO group page feature and/or directly call-out key emergency response personnel.

f. NRC Communications (ENS and HPN)

Communications with the NRC Operations Center will be performed via the NRC ENS and HPN circuits or commercial telephone line. Information is normally communicated from an approved NRC Event Notification Worksheet prior to establishing an open ENS and/or HPN line.

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

1) Emergency Notification System (ENS): Dedicated telephone equipment is in place between the site's Control Room and the NRC, with an extension of that line in the TSC. A separate line is available in the EOF with the capability of being patched with the site through the NRC. This line is used for NRC event notifications and status updates.

2) Health Physics Network (HPN): There also exists a separate dedicated telephone between the NRC, the TSC, and EOF for conveying health physics information to the NRC as requested or as an open line.

2. Medical Communications

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

3. Communications Testing

Communications equipment is checked in accordance with Section H.10. Communications drills between the Licensee and {Commonwealth} and local government facilities are conducted in accordance with Section N.2.a. In addition, minimum siren testing is performed as follows:

{Silent Test.. At least bi-weekly}

{Growl (or Equipment) Test..................Quarterly and during preventive maintenance}

{Full Volume Test.. Annually}

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

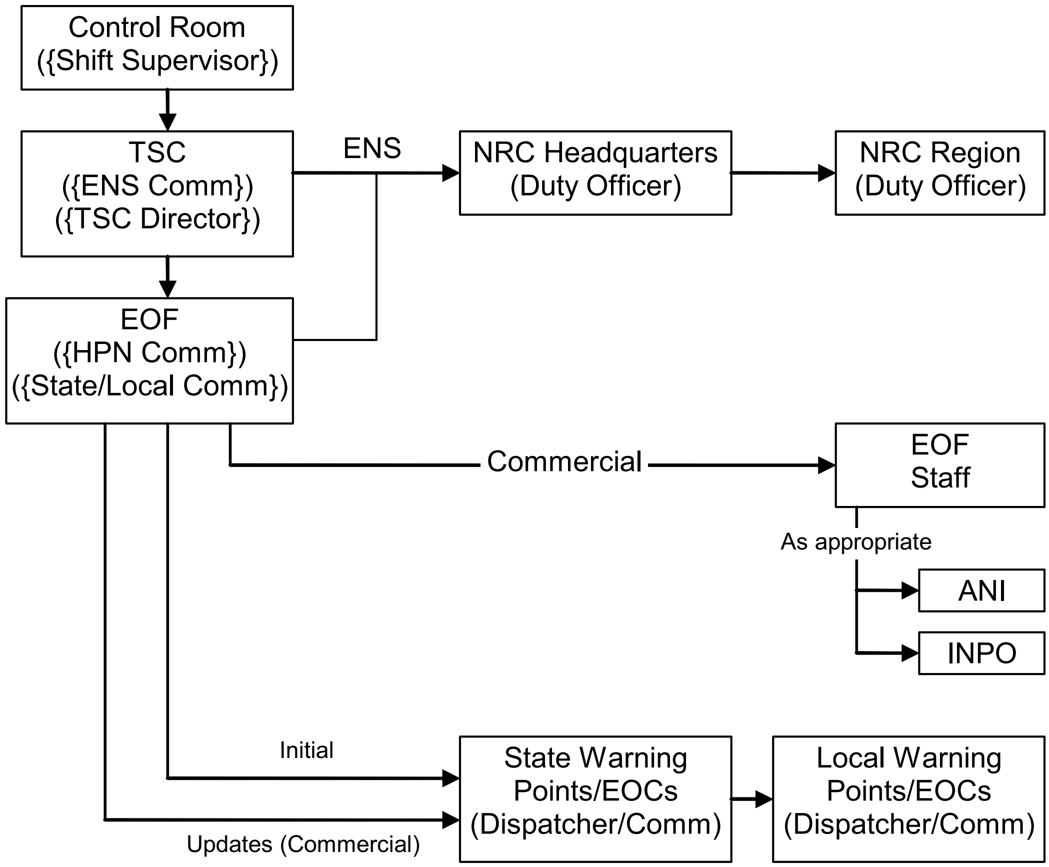
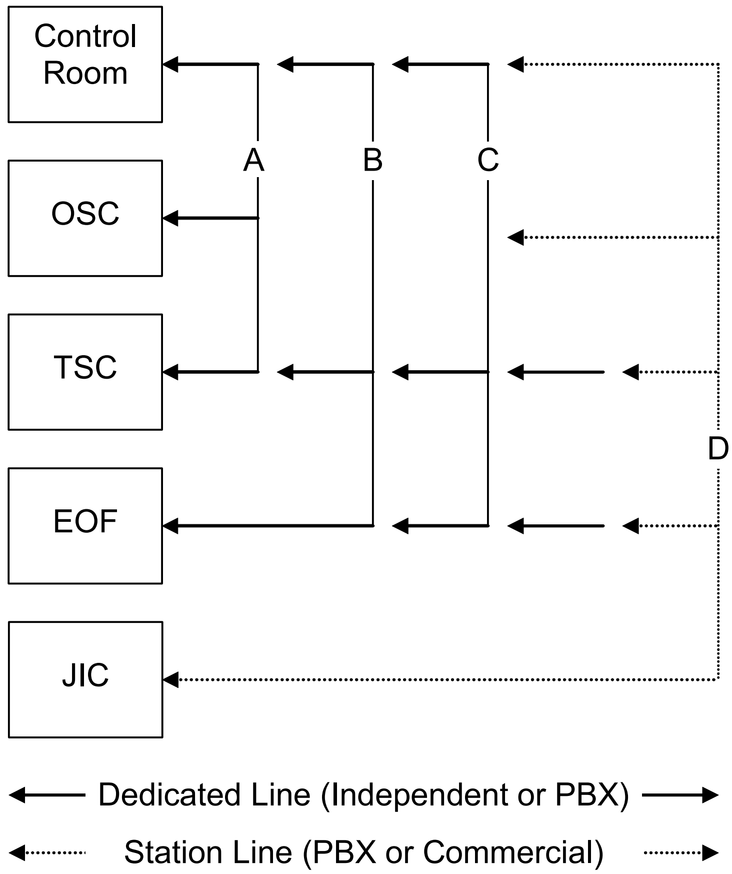


Figure F-2: ERF Communications Matrix



A = {Damage control line (used to coordinate sending teams to take corrective actions) between the OSC, TSC, and Control Room.}

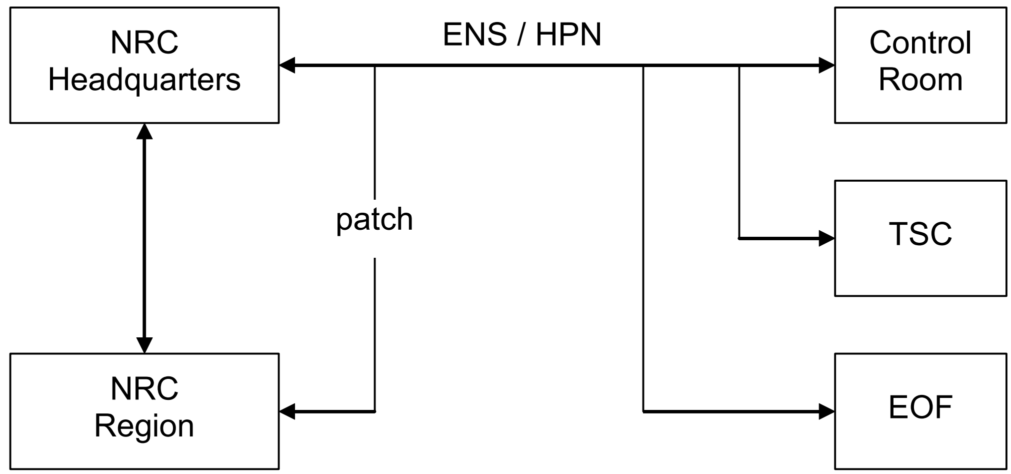
B = {Directors hotline line between the Control Room, TSC and EOF.}

C = {Operations line (used to transmit plant data and operations actions) between the TSC, Control Room and EOF.}

D = {Site telephone line.}

{Note: Other conferencing and ring-down capabilities may be used to enhance communications flow between ERFs and ERO members.}

Figure F-3: NRC Communications for Nuclear Response



NOTE: ENS and HPN circuits may use the federally maintained system, company tie lines or PBX as dedicated primary communications systems and have commercial backups.

Section G: Public Education and Information

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

1. Public Information Publication

{The Commonwealth has overall responsibility for maintaining a continuing disaster preparedness public education program.} The emergency public information publication for the Licensee nuclear site{s} is updated annually, in coordination with {Commonwealth} and local agencies, to address how the general public is notified and what their actions should be in an emergency. The Licensee distributes the publication on an annual basis by mail to all residents within the ten-mile (16-kilometer) plume exposure EPZs and to appropriate locations where a transient population may obtain a copy. Signs or other measures shall be used for transient population which would refer the transient to the telephone directory or other source of local emergency information. The public information publication includes the following information:

a. Educational information on radiation.

b. A description of the times that require public notification, public notification system and what to do if a take-shelter or evacuate recommendation is given.

c. A map of major evacuation routes.

d. A list of communities likely to serve as host shelter areas and instructions on how to obtain additional information, especially for the disabled or their caretakers and those without transportation.

e. Appropriate radio and television frequencies which would provide information on the event.

2. Public Education Materials

Public information publications instruct the public to go indoors and turn on their radios when they hear {PNS} sirens operating. These publications also identify the local radio stations to which the public should tune in for information related to the emergency.

3. Media Accommodations

a. A {communications and public affairs group} is notified when an Unusual Event or higher Emergency condition exists. They will handle public and media inquires in the early stages of the event (until the JIC is activated) by distributing background information, news statements, and providing information to company management.

1) The Public Information Emergency Response Organization: The Public Information ERO may be activated at any time at the discretion of site management. However, normally when there is a procedural requirement to activate the EOF, the Public Information ERO {should} also be activated. It is required to be activated at a Site Area or General Emergency.

The primary purpose of the Public Information ERO is to disseminate information from the Licensee's ERO about the emergency events to the public, via the news media. However, the authority for issuance of news releases for the classification of an Unusual Event or prior to ERO activation will always reside with the {communications and public affairs group}. Upon activation, the Public Information ERO has the responsibility and authority for issuance of news releases to the public.

The Public Information ERO is comprised of senior managers from the Licensee who will function as spokespersons, and other Licensee individuals. The spokespersons disseminate information to the news media/public concerning the emergency events out of a Joint Information Center (JIC).

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

The site has a designated JIC. The JIC is equipped with appropriate seating, lighting and visual aids to allow for public announcements and briefings to be given to the news media. Additionally, the JIC is equipped with commercial telephone lines for making outgoing calls. The Public Information ERO functions from the {JIC and EOF} in preparing and releasing licensee information about the emergency event.

Functions of the JIC include:

- Serving as the primary location for accumulating accurate and current information regarding the emergency conditions and writing news releases.
- Providing work space and phones for public information personnel from the {Commonwealth}, counties, NRC, FEMA, and industry-related organizations.
- Providing telephones for use by the news media personnel.
- Providing responses to media inquiries through personnel monitoring telephones that the media can call for information about an emergency.

b. The news media is not normally permitted into the EOF during an emergency; however, the EOF can accommodate {Commonwealth} and local media staff, if deemed necessary.

4. Coordination of Public Information

a. The JIC is staffed by Licensee and government public information representatives who will be the source of public information during an emergency at the site. The {Company Spokesperson} is the primary spokesperson for the Licensee. The {Company Spokesperson} has direct access to all necessary information (see Section B.5).

b. The JIC is staffed by federal, {Commonwealth}, local, and licensee personnel to assure timely, periodic exchange and coordination of information. Representatives coordinate information prior to conducting news briefings.

c. Rumors or misinformation are identified during an emergency by the media/rumor control monitors. They respond to public and news media calls and monitor media reports.

5. Media Orientation

Emergency Preparedness, in conjunction with the Licensee {communications and public affairs group}, offers programs ({at least annually}) to acquaint news media with the E-Plan, information concerning radiation, and points of contact for release of public information in an emergency.

Section H: Emergency Facilities and Equipment

Onsite and offsite facilities are available for emergency assessment, communications, first aid and medical care, and damage control. Of particular importance are the Emergency Response Facilities (ERFs); the Control Room (CR), the Technical Support Center (TSC), the Operations Support Center (OSC), the Emergency Operations Facility (EOF), and the Joint Information Center (JIC).

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

1. Control Room, Technical Support Center, and Operations Support Center

The Licensee has established TSC(s) and OSC(s), which are activated upon declaration of an Alert or higher classification. Until they become operational, required functions of these facilities are performed by Shift Personnel and directed from the Control Room.

a. Control Room: The Control Room(s) are the centralized onsite location from which the Nuclear Site's reactor(s) and major plant systems are operated. The Control Room(s) are equipped with instrumentation to supply detailed information on the reactors and major plant systems. The Control Room(s) are continuously staffed with qualified licensed operators. The Control Room is the first onsite facility to become involved with the response to emergency events. Control Room personnel must evaluate and effect control over the emergency and initiate activities necessary for coping with the emergency until such time that support centers can be activated. These activities shall include:

- Reactor and plant control.
- Initial direction of all plant related operations.
- Accident recognition, classification, mitigation and initial corrective actions.
- Alerting of onsite personnel.
- Activation of emergency response facilities and ERO notification.
- Notification of offsite agencies.
- Notification of appropriate individuals and activation of ERDS.
- Continuous evaluation of the magnitude and potential consequences of an incident.
- Initial dose projections.
- Recommendations for immediate protective actions for the public.

As other ERFs become activated, they will supply support to the Control Room(s). Overall Command and Control of the emergency will transfer to the TSC(s) or the EOF when they are properly staffed and ready to take over these responsibilities. Throughout all emergencies, the Control Room(s) maintain emergency activation status until normal operational status may be resumed.

b. Technical Support Center (TSC): {BBNPP} has established unit TSC(s) for use during emergency situations by site management, technical, and engineering support personnel. The TSC is activated for all emergencies classified as Alert or higher. Activation for other events is optional. When activated the TSC functions include:

- Support for the Control Room's emergency response efforts.
- Performance of the non-delegable functions when in Command & Control.
- Continued evaluation of event classification.
- Assessment of the plant status and potential offsite impact.
- Coordination of emergency response actions.
- Notification of appropriate corporate and site management.
- Notification and update of the NRC via Emergency Notification System (ENS) including activation of Emergency Response Data System (ERDS).

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

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

The TSC provides reliable voice communications to the Control Room, the OSC, the EOF, the NRC, and {Commonwealth} and local Emergency Operations Centers. Additional communications capabilities are also available in the TSC (see Section F.1).

The TSC is sized to accommodate a minimum of 25 spaces and supporting equipment. This includes provisions for five NRC representatives.

Personnel in the TSC shall be protected from radiological hazards, including direct radiation and airborne contaminants under accident conditions with similar radiological habitability as Control Room personnel. To ensure adequate radiological protection, permanent radiation monitoring systems have been installed in the TSC and/or periodic radiation surveys are conducted. These systems indicate radiation dose rates and airborne radioactivity inside the TSC while in use. In addition, protective breathing apparatus (full-face air purifying respirators) and KI are available for use as required.

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

c. Operations Support Center (OSC): Each station unit has established an OSC. The OSC is the onsite location where site support personnel report during an emergency and from which they will be dispatched for assignments or duties in support of emergency operations. The OSC shall be activated whenever the TSC is activated, but need not remain activated at the Alert level if its use is judged unnecessary by the {Emergency Plant Manager}. At the Site Area and General Emergency levels, the OSC or an alternate OSC shall be activated at all times. Activation for other events is optional. {BBNPP} disciplines reporting to the OSC include, but are not limited to:

- Operating personnel not assigned to the Control Room,
- Radiation Protection Personnel,
- Chemistry Personnel,
- Maintenance Personnel (mechanical, electrical and I&C).

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

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

d. Alternate Mustering Facility

An alternate near site location has been identified and equipped for security and other events which may prevent response of the ERO to the primary Emergency Response Facilities.

2. **Emergency Operations Facility (EOF)**

The EOF is the location where the {Emergency Director} will direct the ERO in evaluating and coordinating the overall company activities involved with an emergency. Activation of the EOF is mandatory upon declaration of an Alert or higher classification. The EOF provides for:

- Management of overall emergency response.
- Coordination of radiological and environmental assessments.
- Determination of recommended public protective actions.
- Management of recovery operations.
- Coordination of emergency response activities with Federal, {Commonwealth}, and local agencies.

The EOF was designed with the following considerations:

- The location provides optimum functional and availability characteristics for carrying out overall strategic direction of the Licensee onsite and support operations, determination of public protective actions to be recommended to offsite officials, and coordination with Federal, {Commonwealth} and local organizations.
- It is of sufficient size to accommodate about 50 people.
- It is equipped with reliable voice communications capabilities to the TSC, the Control Room, NRC, and {Commonwealth} and local emergency operations centers. In addition, the EOF has facsimile and computer transmission capabilities.
- Equipment is provided to gather and display data needed in the EOF to analyze and exchange information on plant conditions with the Site. The EOF technical data system receives, processes, and displays information sufficient to perform assessments of the actual and potential onsite and offsite environmental consequences of an emergency condition.
- The EOF has ready access (either through hard copies or electronic media) to plant records, procedures, and emergency plans needed for effective overall management of the Licensee emergency response resources.

3. Emergency Operations Centers

EOCs operated by the {Commonwealth} and local communities have been established to perform direction and control of emergency response functions.

The respective {Commonwealth} EOCs are capable of continuous (24-hour) operations for a protracted period. These centers contain sufficient communications (radio, telephone, computer and Fax machines) equipment, maps, emergency plans, and status boards to provide the necessary interfaces with other federal, {Commonwealth}, local, and site emergency facilities.

The county EOCs serve as Command and Control headquarters for local emergency response activities as well as a center for the coordination of communications to field units and to the {Commonwealth} EOCs. These EOCs have the equipment necessary, (such as facsimile machines, telecommunications equipment, radio gear, photocopiers, wall maps, etc.) to carry out their emergency responsibilities.

4. Activation

The Licensee has put into place plans and procedures to ensure timely activation of its emergency response facilities. The {Shift Supervisor} (as {Interim Emergency Director}) will initiate a call-out in accordance with the implementing procedures. The ERO augmentation process identifies individuals who are capable of fulfilling the specific response functions that are listed in Table B-1a (located in section B and unit Annex) and Table B-1b. This table was developed based on the functions listed in NUREG-0654, Table B-1.

Although the response time will vary due to factors such as weather and traffic conditions, {onsite facilities (TSC / OSC) will reach minimum staffing within 60 minutes and offsite facilities (EOF / JIC) will reach minimum staffing within 90 minutes} following the declaration of an Alert or higher emergency classification. Additionally, plans have been developed to ensure timely functional activation and staffing of the JIC when the classification of Site Area Emergency is declared or at the direction of the {Emergency Director}.

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

5. Monitoring Equipment Onsite

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

a. Geophysical Monitors

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

   Meteorological tower instrumentation includes sensors for measurement of wind speed, wind direction, and ambient temperature. A rain gauge is located at or near the base of the tower. Measurements of wind speed, direction, and temperature are made at 10 meters above grade and at a height above grade at which measurements will be representative of conditions at the stack top. A distance approximately ten times the obstruction height around the tower is maintained in accordance with established standards for meteorological measurements.

   With regard to the {BBNPP} meteorological monitoring program, there has been a quality assurance program adopted from 10 CFR 50, Appendix B. However, since the meteorological facilities are not composed of structures, systems, and components that prevent or mitigate the consequences of postulated accidents and are not "safety related," not all aspects of 10 CFR 50, Appendix B, apply. Those aspects of quality assurance germane to supplying good meteorological information for a nuclear power plant were adopted into the quality assurance program.

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

2) Seismic Monitoring: The seismic monitoring system measures and records the acceleration (earthquake ground motion) of selected structures. Earthquakes produce frequency dependent accelerations which, when detected by the remote sensing devices, are permanently recorded as information which defines the seismic input. The system remains in a standby condition until an earthquake, above a preset target acceleration, causes the remote unit(s) to activate the recording circuits and signals the Main Control Room that a seismic event is being recorded.

3) Hydrological Monitors: The design basis flood, maximum precipitation, and other improbable, conceivable extremes in hydrologic natural phenomena and be used to show hydrological conditions are below or above any design limits for the Unit as detailed in the FSAR.

b. Radiological Monitors and Sampling

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

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

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

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

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

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

The sampling systems use a number of manual sampling techniques to enable reactor coolant and containment sampling operations over a wide range of plant conditions to allow operator actions to be taken to mitigate and control the course of an accident. Refer to the FSAR for further detail on sampling capabilities.

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

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

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

2) Safety Parameter Display System (SPDS): SPDS provides a display of plant parameters from which the safety status of operation may be assessed in the Control Room, and TSC for the site (the EOF {and Commonwealth} can access similar data through the use of a alternate computer system). The primary function of the SPDS is to help operating personnel in the Control Room make quick assessments of plant safety status. SPDS and/or other display systems in the TSC, EOF {and Commonwealth facility(ies)} promote the exchange of information between these facilities and the Control Room and assists the emergency organization in the decision making process.

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

6. Monitoring Equipment Offsite

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

a. Geophysical Monitors: In the event that the onsite meteorological tower or monitoring instrumentation becomes inoperative and the contracted weather provider cannot be contacted, meteorological data may be obtained directly from the National Weather Service or the internet.

   A considerable array of seismometers are located in the region. A central point of contact to obtain information about a seismic event is the National Earthquake Information Service in Golden, Colorado.

b. Radiological Environmental Monitors and Sampling: The Licensee has an extensive offsite environmental monitoring program to provide data on measurable levels of radiation and radioactive materials in the environs. The program (described fully in the Offsite Dose Calculation Manual), includes:

   - Fixed continuous air samplers.
   - Routine sampling, as applicable, of ground and surface water; milk and fish.
   - A fixed TLD monitoring network.

   The TLD program consists of the following elements:

   - {A near-site ring of dosimeters covering the 16 meteorological sectors.}
   - {TLDs placed at each of the normal fixed air sampler locations (typically about 8-15 air samplers).}

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

   Outside analytical assistance may be requested from {Commonwealth} and federal agencies, or through contracted vendors. The NRC mobile laboratory may be made available for Site Area and General Emergencies. The DOE, through the Interagency Radiological Assistance Program (IRAP) has access to any national laboratory (i.e., Brookhaven, Oak Ridge, Lawrence Livermore, etc.).

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

7. Offsite Monitoring Equipment Storage

{BBNPP} maintains a sufficient supply of emergency equipment (such as portable survey, counting, and air sampling instrumentation and other radiological monitoring equipment and supplies) that may be used for environmental monitoring. These supplies meet the initial requirements for {two} Environmental Monitoring Teams. During subsequent phases of an emergency, additional equipment is available from other Licensee generating sites, vendors, industry, and offsite response organizations.

8. Meteorological Monitoring

The site has installed and maintains a meteorological tower equipped with instrumentation for continuous reading of the wind speed, wind direction, air temperature and delta air temperature. Additional capabilities are available to obtain representative current meteorological information from other sources, such as the National Weather Service. A full description of the onsite meteorological capabilities is given in Section H.5.a of this Plan.

9. Operations Support Center Capabilities

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

Sufficient radiation protection equipment (i.e., protective clothing, respiratory protection gear, KI, and other health physics equipment and supplies) is stored and maintained near the OSC (as well as the other emergency response facilities). Repair team equipment is available near the OSC as well as in the maintenance shops. The OSC is stocked with an assortment of first aid and medical treatment equipment and supplies. The OSC maintains reliable voice communications with the CR, TSC, and EOF. For a complete description of communications equipment, refer to Section F. {When an emergency condition exists at one unit, additional supplies may be obtained from other unaffected units and any corporate resources upon request.}

10. Facility and Equipment Readiness

Emergency facilities and equipment are inspected and inventoried in accordance with emergency preparedness procedures. These procedures provide information on location and availability of emergency equipment and supplies. An inventory of all emergency equipment and supplies is performed on a {quarterly} basis and after each use in an emergency or drill. During this inventory, radiation monitoring equipment is checked to verify that required calibration period and location are in accordance with the inventory lists. Calibration of equipment shall be, at a minimum, at intervals recommended by the supplier of the equipment. Inspections include an operational check of instruments and equipment. Equipment, supplies, and parts which have a shelf-life are identified, checked, and replaced as necessary. Sufficient reserves of instruments and equipment are maintained to replace whose which are removed from emergency kits or lockers for calibration or repair. The Licensee is responsible for maintaining a supply of KI at the site.

11. General Use Emergency Equipment

Inventory procedures identify the equipment available within each emergency facility. Table H-1, Typical Emergency Equipment, lists typical portable emergency equipment available to the ERO. In addition, all normal resources available onsite will be used as necessary to support emergency response.

12. Collection Point for Field Samples

The onsite chemistry lab, has been designated as the central point for the receipt and analysis of radiological field monitoring samples. Sampling and analysis equipment is available for activity determination of these samples. Sufficient field monitoring equipment is maintained at the site for initial sampling. Instrumentation and equipment utilized for sample activity determination are routinely calibrated to ensure timely availability.

Table H-1
Typical Emergency Equipment

MS-2 / SPA-3 / Pig / Holder / Source[1]	Low Range (mrem/mSv) Dosimeters
RO-2 Survey Meters [1]	High Range (Rem/Sv) Dosimeters
RM-14 / HP210 Frisker [1]	Electronic Dosimeters
RM-14 / HP210 / SH4 Counter [1]	Dosimeter Chargers
Teletectors	3-Pocket Radiation Area Signs w/ Inserts
Instrument Check Sources	Box of Pens and Box of Grease Pencils
Air Sampler w/Sample Holder	Planchets
Extra Air Sampler Heads	Radioactive Material Tags
Charcoal Filters	Step off Pads – Check Shoes
Silver Zeolite Iodine Cartridges	Step off Pads – White
Particulate Filters	Dirty Shoe Cover Bags
Planchets	Gauze Wipes
Smear Paper	Smears
Package of 14 KI Tablets	Rad Rope
Extension Cords (25')	Extension Cords
Log Books	KI Tablets
Scientific Calculator	Magnetic Door Signs – No Entry
Gauze Wipes	Magnetic Door Signs – TSC/OSC Entrance
Anti "C" Clothing Kits	Cloth Coveralls
Writing and other Office Supplies	Paper Coveralls
Full Face Respirators w/Iodine Cartridge	Low Shoe Covers
Self Breathing Air Apparatus	High Shoe Covers
Portable Communication Equipment (Radios/Cell Phones)	Hoods
	Cotton Liners
	Rubber Gloves

Note 1: or equivalent instruments.

Section I: Accident Assessment

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

1. Plant Parameters and Corresponding Emergency Classification

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

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

2. Onsite Accident Assessment Capabilities

The resources available to provide initial and continuing information for accident assessment throughout the course of an event include plant parameter display systems, liquid and gaseous sampling system, Area and Process Radiation Monitoring Systems, and Accident Radiation Monitoring Systems (which includes the high range containment radiation monitors). Descriptions of these systems are given in Section H.5.b.

3. Source Term Determination

Source term (or core damage) estimations serve several roles within the {BBNPP} Emergency Preparedness Program. For planning purposes, core damage considerations are used as the bases for several of the Emergency Action Level (EAL) Initiating Conditions and as the threshold for the declaration of a General Emergency (the definition of a General Emergency specifies conditions which involve ‘substantial’ core degradation or melting as one of the bases for classification).

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

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

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

- <u>Containment Radiation Monitors:</u> An indirect method used to determine the amount of core damage. Applicable to Loss of Coolant Accident (LOCA) scenarios. Based upon an end-of-life source term and static nuclide ratio assumptions yielding a limited accuracy. Valid any time following an accident.
- <u>Core Temperatures:</u> Methods such as Core Exit Thermocouple (CET), Peak Core Temperatures and Hot Leg Temperatures provide indirect methods used to indicate the type and/or amount of core damage. Applicable for all types of accidents. Valid any time following an accident.
- <u>Core Uncovery:</u> Methods such as Core Uncovery Time, Reactor Vessel Level Indication System Level and Source Range Monitor count rate provide indirect methods used to indicate the type of core damage (clad failure or fuel melt). Applicable for all types of accidents. Provides a relatively accurate estimate of the state of the core early in the event. Valid any time following an accident.
- <u>Containment Hydrogen Concentration:</u> An indirect method used to establish the type of core damage. Applicable to LOCA type accidents where all the hydrogen generated by the metal-water reaction is released into containment. Valid any time following an accident.
- <u>Sample Analysis - Isotopic Ratio Comparison:</u> A direct method used to establish the type of core damage. Compares expected isotopic ratios with a sample to determine a general core state. Applicable under all types of accidents. Valid any time following an accident.

- Sample Analysis - Presence of Abnormal Isotopes: A direct method used to provide a go/no go indication of fuel melt by the presence of unusually high concentrations of the less volatile fission products. Applicable under all types of accidents. Valid any time following an accident.
- Sample Analysis - Concentration Evaluation: A direct method that yields the most accurate numerical estimations of the amount of core damage. Applicable for all types of accidents. Requires the sampled system(s) be in a steady state that usually prevents its use until the plant is in a stable condition.

4. Effluent Monitor Data and Dose Projection

Dose assessment or projection represents the calculation of an accumulated dose at some time in the future if current or projected conditions continue. During an accident, the Unit's Parameter Display System and personal computers will provide the ERO with the timely information required to make decisions. Radiological and meteorological instrumentation readings are used to project dose rates at predetermined distances from the site, and to determine the integrated dose received. A computerized dose assessment program with similar capabilities and outputs as the NRCs Radiological Assessment System for Consequence Analysis (RASCAL) program will be used. Dose assessment methods used by the ERO to project offsite doses include:

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

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

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

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

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

First: Onset of a release to 1 hour post-accident: Shift personnel will rely on a simplified computerized dose model to assist them in developing offsite dose projections using real time data from effluent monitors and site meteorology.

Second: 1 hour post-accident to event termination: Estimates of off-site doses based on more sophisticated techniques are provided. Dedicated ERO personnel will analyze the offsite consequences of a release using more complex computerized dose modeling. These additional methods are able to analyze more offsite conditions than the simplified quick method, as well account for more specific source term considerations.

5. Meteorological Information

Local meteorological data is available from an onsite meteorological tower. The data available includes wind speed, wind direction, temperature, and delta temperature. These data are used by the site ERO and are provided to the {Commonwealth}, and NRC to enable near real-time predictions of the atmospheric effluent transport and diffusion. Meteorological data from the tower is available in the CR, TSC, and EOF. A full description of the onsite meteorological capabilities is given in Section H.5.a.

6. Unmonitored Release

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

7. Onsite and Offsite Monitoring

In addition to the capabilities and resources described in Section H.6.b and H.7, the Licensee maintains the ability to take offsite air samples and to directly measure gamma dose rates the event of an airborne or liquid release. The capability to take offsite soil, water, and vegetation samples is also provided by either the Monitoring Teams or a contracted vendor.

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

8. Monitoring Teams

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

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

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

The expertise necessary to conduct limited offsite environmental survey and sampling exists onsite 24 hours a day. A minimum of two offsite Monitoring Teams are notified and activated at an Alert or higher classification. Teams composed of two individuals are assembled to test and inventory dedicated survey and sampling equipment and are then dispatched in company or personal vehicles into the surrounding area when a release is or is expected to occur. {This capability exists upon EOF activation.} Radiological survey and sample data is transmitted to the emergency facilities. Vendor/contractor support can be used to perform collection, shipment and analysis of environmental sample media as described in Section B.8.c.

9. Iodine Monitoring

Monitoring equipment has the capability to detect and measure airborne radioiodine concentrations as low as 1×10^{-7} $\mu Ci/cm^3$ in the field. Interference from the presence of noble gas and background radiation will be minimized by ensuring that monitoring teams move to areas of low background prior to analyzing the sample cartridge. The collected air sample is measured by hand held survey meter as an initial check of the projection derived from plant data to determine if significant quantities of elemental iodine have actually been released.

10. Dose Estimates

Specific procedures exist for the correlation of air activity levels to dose rate for key isotopes. Provisions have been established for estimating integrated dose from the projected and actual dose rates and for the comparison of these estimates with the protective action guides.

11. {Commonwealth} Monitoring Capabilities

The {Commonwealth} has the ability to dispatch their own field monitoring teams to track the airborne radioactive plume. The states also have the ability and resources to coordinate with federal and licensee monitoring teams to compare sample results.

Section J: Protective Response

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

1. Notification of Onsite Personnel

For all emergency classifications, all personnel within the Protected Area are notified within 15 minutes of the initial classification or escalation of an emergency by recognizable alarms, and/or verbal announcements over the plant Public Address (PA) System. Announcements include the emergency classification and response actions to be taken by personnel onsite (such as ERO, non-ERO, contractor personnel, and visitors). Provisions are made to alert personnel in high noise areas and outbuildings within the Protected Area as applicable.

The plant has identified locations where people might be expected to be present outside the Protected Area but within the Owner Controlled Area. Accountability of persons within the Owner Controlled Area but outside the Protected Area is not required. However, provisions are established for notification of personnel within the Owner Controlled Area any time a Site Evacuation has been initiated, or as otherwise deemed appropriate.

2. Evacuation Locations

If a Site Evacuation is required, non-essential personnel are directed to either assemble within designated Assembly Areas or to immediately evacuate the site. Personnel will be directed to either proceed to their homes or to reassemble at designated offsite locations. Visitors to the site will assemble with and follow the instructions of their escorts. Non-essential personnel within the Protected Area will normally exit through {security access portal}. Personal transportation (if available) will normally be used and established evacuation routes will be followed. Personnel without transportation will be identified and provided transportation as necessary.

3. Radiological Monitoring of Evacuees

Personnel evacuating the {BBNPP} site will be monitored for contamination by the portal monitors as they exit the Protected Area(s), with portable friskers in Assembly Areas, or sent to offsite monitoring locations on an as needed basis. If there is no release of radioactive materials within {BBNPP}, limited monitoring (less than 100% of evacuees) may be utilized to speed the evacuation process.

4. Evacuation

Evacuation is the primary protective action anticipated for onsite personnel not having immediate emergency response assignments. The site has identified locations that serve as Assembly Areas and offsite locations for non-essential personnel when they are not instructed to proceed home. The specific locations of these areas are provide locations or located in the {BBNPP Annex}. Implementing procedures describe equipment, supplies and general operation of these facilities. The {Emergency Plant Manager} and/or {Shift Supervisor} will designate personnel within the Site Boundary as essential or nonessential. Evacuation of non-essential personnel is usually conducted immediately after accountability if a Site Area Emergency or General Emergency has been declared and conditions permit. Evacuation shall commence in accordance with site procedures as directed by the {Emergency Plant Manager} or his/her designee, unless one of the following conditions exist:

a. Severe weather conditions threaten safe transport.

b. A significant radiological hazard would be encountered.

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

d. A condition similar to the above in magnitude, which in the opinion of the {Emergency Plant Manager} would adversely affect the site personnel.

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

The initiation of a site evacuation will be reported to the appropriate {Commonwealth}/local agency.

5. Accountability

The purpose of Accountability is to determine the locations of all personnel inside the Protected Area and to muster emergency personnel at prearranged locations. When Accountability of unit personnel is determined to be necessary by the {Shift Supervisor} or the {Emergency Plant Manager}, all personnel within the affected unit protected area shall be accounted for and the names of missing individuals (if any) are determined within thirty (30) minutes of the {emergency announcement}. Should missing personnel be identified, search and rescue operations are initiated.

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

If it is determined that the prearranged Assembly Area is unfit for personnel, the {Shift Supervisor} or the {Emergency Plant Manager} may designate an alternative Assembly Area and direct personnel using appropriate communication systems that are available.

Once established, Accountability within the Protected Area is maintained throughout the course of the event, unless specifically terminated by the {Emergency Plant Manager}.

6. Provisions for Onsite Personnel

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

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

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

c. Use of Potassium Iodide (KI): The use of KI may be recommended when a projected dose of 50 Rem (0.5 Sv) Committed Dose Equivalent (CDE) is exceeded for an emergency worker's thyroid. This is the value specified in EPA 400-R-92-001, “Manual of Protective Action Guides and Protective Actions for Nuclear Incidents”. The station(s) are responsible for maintaining a supply of KI at their respective site. The {Emergency Plant Manager} or {Emergency Director} has the responsibility for approval of issuing KI to Licensee emergency workers.

7. Mechanism for Implementing Protective Action Recommendations

Plant conditions, projected dose and dose rates, and/or field monitoring data are evaluated to develop PARs for the purpose of preventing or minimizing exposure to the general public. PARs are provided to the offsite agencies responsible for implementing protective actions for the general public within the 10-mile (16-kilometer) EPZ. PARs are approved by the individual in Command and Control ({Shift Supervisor}, {Emergency Plant Manager} or {Emergency Director}).

In an emergency that requires immediate protective actions be taken prior to activation of the offsite emergency facilities, PARs are provided directly to the {Commonwealth} and local 24 hour warning points by the {Shift Supervisor}.

8. Evacuation Time Estimates (ETEs)

An independent ETE report has been performed to provide estimates of the time required to evacuate resident and transient populations surrounding the site for various times of the year under favorable and adverse conditions. ETEs for evacuation of the plume exposure EPZ are in Appendix 5 and detailed in the referenced ETE report.

9. Capability of Implementing Protective Action Recommendations

The responsibility for implementing protective measures based on protective action guides for the offsite population at risk is the responsibility of the {Commonwealth} and local governments. Detailed procedures for public protective actions are contained in the {Commonwealth} and other local radiological emergency response plans as appropriate.

{The Commonwealth agencies are responsible for evaluation of the Licensee developed protective actions recommendations and preparing an independent recommendation to the Governor, or his/her appointed agent. Only when the Commonwealth acts under the Governor's order does a protective action recommendation become a directed protective action.}

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

10. Implementation of Protective Action Recommendations

The licensee, {Commonwealth}, and local emergency plans used to implement the protective measures for the plume exposure pathway take numerous factors into consideration. Among these considerations are:

a. Most of the public evacuees are expected to travel in their own vehicles, leaving the EPZ via designated evacuation routes. The {Commonwealth} and county plans contain official maps and information on the locations of off-site centers.

b. The population distribution around the site. Population distribution for the plume exposure EPZ is contained in Appendix 5 of this plan.

c. As indicated in Section E, offsite agencies are notified when an event is declared. {Commonwealth} and local agencies have the capability to notify all members of the transient and resident population within the Plume Exposure Pathway EPZ.

d-l. Items addressed separately in {Commonwealth} and local emergency plans.

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

1) Plant Based PARs

Figure J-1 has been developed to aid Licensee personnel providing PARs based on the above. Possible plant based PARs issued at a General Emergency include:

- {Shelter of the general public within a two mile (3.2 kilometer) radius and five miles (eight kilometers) downwind (puff release above PAGs)}
- {Evacuation of the general public within a two mile (3.2 kilometer) radius and five miles (eight kilometers) downwind.}
- {Evacuation of the general public within a five mile (eight kilometers) radius and ten miles (16 kilometers) downwind.}

In addition to the above actions to minimize or prevent potential exposure to radiation, a recommendation of heightened awareness will be issued for the remainder of the EPZ consistent with the specific terminology in use by the applicable offsite organizations. For example, some entities use the term shelter to achieve heightened awareness, while others reserve shelter exclusively for dose reduction measures.

2) Dose Based PARs

{Evacuation is recommended if projected doses reach the minimum EPA PAGs (1 Rem (0.01 Sv) EPA TEDE[1] or 5 Rem (0.05 Sv) CDE Child Thyroid).}

{Shelter is recommended if projected doses reach the minimum EPA PAGs (1 Rem (0.01 Sv) EPA TEDE or 5 Rem (0.05 Sv) CDE Child Thyroid) AND a puff release is in progress.}

Many assumptions exist in dose assessment calculations, involving both source term and meteorological factors, which make computer predictions over long distances highly questionable. However, in the event dose assessment results indicate the need to recommend actions beyond the outer EPZ boundaries, that is past 10 miles (16 kilometers), Monitoring Teams are dispatched to downwind areas to verify the calculated exposure rates prior to issuing PARs outside the EPZ.

[1] EPA TEDE is defined as the sum of the doses from external exposure and inhalation from the plume, and from 4 days of external exposure to deposited materials.

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

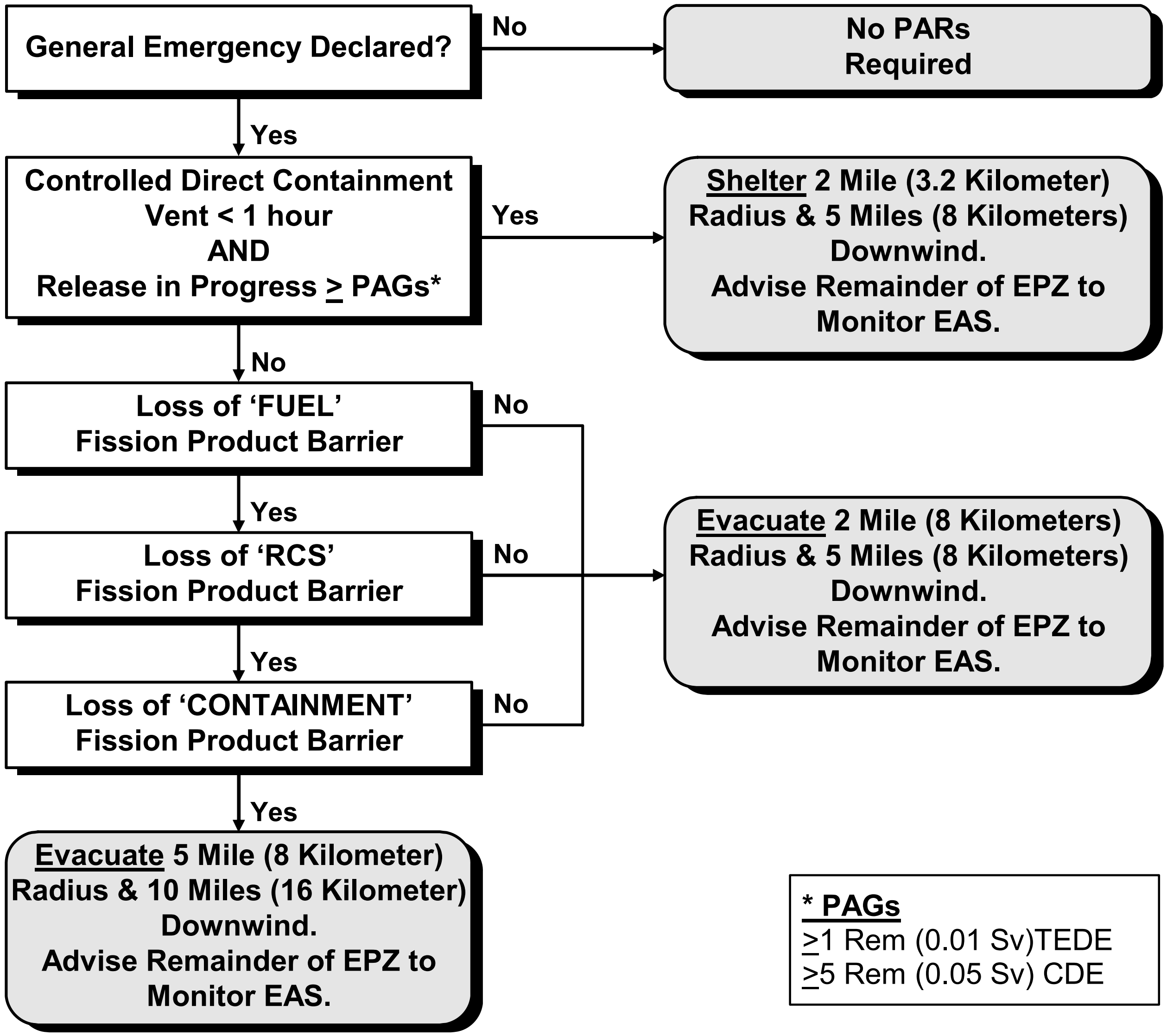
11. Ingestion Pathway Protective Measures

The responsibility for specifying protective measures to be used for the ingestion pathway rests with the {Commonwealth}. These measures have been developed by the {Commonwealth} and include the methods for protecting the public from consumption of contaminated water and foodstuffs.

12. Monitoring of Evacuees

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

{Figure J-1:   Generic PAR Flowchart }



Note: LOSS of a fission product barrier as defined in the Emergency Action Level (EAL) Matrix.

Section K: Radiological Exposure Control

This section of the plan describes the means for controlling emergency worker radiological exposures during an emergency, as well as the measures and exposure guidelines that are used by the Licensee for removal of injured persons; undertaking corrective actions; performing assessment actions; providing first aid; performing personnel decontamination; providing ambulance service; and providing medical treatment services to persons exposed to radiation and/or radioactive materials.

Exposure guidelines in this section are consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides described in EPA 400-R-92-001.

1. Emergency Exposure Guidelines

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

Dose Limit (Rem TEDE) (Sv TEDE)	Activity	Condition
0-5 (0-0.05)	All	Personnel should be kept within normal 10 CFR 20 limits during bona fide emergencies, except as authorized for activities as indicated below.
5-10 (0.05-0.1)	Protecting valuable property	Lower dose not practicable.
10-25 (0.1-0.25)	Lifesaving or protection of large populations	Lower dose not practicable.
> 25 (> 0.25)	Lifesaving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved.

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

Whenever possible, the concurrence of the {Radiation Protection Manager} should be secured before exposing individuals to dose equivalents beyond the EPA-400 lower limit.

2. **Emergency Radiation Protection Program**

The {Radiation Protection Manager} is the individual responsible for the implementation of the radiation protection actions during an emergency. Radiation protection guidelines include the following:

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

- Persons undertaking any emergency operation in which the dose will exceed 25 Rem (0.25 Sv) TEDE should do so only on a voluntary basis and with full awareness of the risks involved including the numerical levels of dose at which acute effects of radiation will be incurred and numerical estimates of the risk of delayed effects.

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

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

- Access to high radiation areas is only permitted with prior approval of the applicable {Radiation Protection Manager}. Personnel are not allowed to enter known or potential high radiation areas unless their exposure has been properly evaluated.

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

3. **Personnel Monitoring**

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

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

4. Non-Licensee Personnel Exposure Authorization

The responsibility for authorizing non-Licensee emergency workers (i.e., Federal, {Commonwealth} and local agency emergency workers) to receive exposures in excess of the EPA General Public Protective Action Guides rests with the Federal, {Commonwealth} and Local organizations, except when such emergency workers are onsite. Authorization of exposures in excess of EPA General Public Protective Action Guides, in this latter instance, rests with the {Emergency Plant Manager}.

5. Contamination and Decontamination

During an emergency, the {Emergency Plant Manager} is responsible for preventing or minimizing personnel exposure to radioactive materials deposited on the ground or other surfaces. Special consideration should be given to setting up contamination control arrangements for personnel entering the OSC after completion of assigned activities.

a. Contamination Limits: During emergency conditions, normal plant contamination control criteria will be adhered to as much as possible. However, these limits may be modified by the applicable {Radiation Protection Manager} should conditions warrant.

b. Contamination Control Means: Personnel found to be contaminated will normally be attended to at decontamination areas located onsite. Temporary decontamination areas can also be set up inside at various locations. Decontamination showers and supplies are provided onsite with additional personnel decontamination equipment and capabilities. Shower and sink drains in the controlled area are routed to the miscellaneous waste processing system where the liquid is processed and monitored prior to discharge. Potentially contaminated emergency vehicles will be surveyed before they released from the plant or offsite assembly area for non-emergency use. If the survey area is not suitable for monitoring and decontamination due to radiological or other concerns, vehicles will be surveyed at an alternate location.

6. Contamination Control Measures

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

a. Contaminated areas are isolated as restricted areas with appropriate radiological protection and access control. Personnel leaving contaminated areas are monitored to ensure they and their clothing are not contaminated. If contamination above acceptable levels is found, they will be decontaminated in accordance with plant procedures. If normal decontamination procedures do not reduce personnel contamination to acceptable levels, the case will be referred to a competent medical authority. Supplies, instruments, and equipment that are in contaminated areas or have been brought into contaminated areas will be monitored prior to removal. If found to be contaminated, they will be decontaminated using normal plant decontamination techniques and facilities or may be disposed of as radwaste. Contaminated vehicles will be decontaminated before being released.

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

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

7. Decontamination of Relocated Personnel

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

Section L: Medical and Public Health Support

This section describes the arrangements for medical services for contaminated injured individuals sent from the site.

1. Offsite Hospital and Medical Services

The Licensee assist local hospitals to ensure support hospital personnel have been trained using the standards of FEMA Guidance Memorandum MS-1, "Medical Services". The hospitals are equipped to handle contaminated or radiation injured individuals. Specifically, training of medical support personnel at the hospitals will include basic training on the nature of radiological emergencies, diagnosis and treatment, and follow-up medical care. Site personnel are available to assist medical personnel with decontamination radiation exposure and contamination control. Arrangements, by letter of agreement or contract, are maintained by the Licensee with a qualified hospital located in the vicinity of the site for receiving and treating contaminated or exposed persons with injuries requiring immediate hospital care. The Licensee shall arrange for medical consultants to aid in any special care necessary at these facilities.

These agreements are verified annually. Refer to section P.4 for details.

2. Onsite First Aid Capability

The site maintains onsite first aid supplies and equipment necessary for the treatment of contaminated or injured persons. In general, physicians or nurses are not staffed at the site, and as such, medical treatment given to injured persons is of a "first aid" nature. Additionally, the Radiation Protection Technicians at the site are experienced in control of radioactive contamination and decontamination work. Site personnel are also trained and qualified to administer first aid. {At least two of these individuals} are available on shift at all times. The functions of site personnel in handling onsite injured people are:

1) Afford rescue;

2) Administer first aid including such resuscitative measures as are deemed necessary;

3) Begin decontamination procedures; and

4) Arrange for suitable transportation to a hospital when required.

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

Site personnel provide an initial estimate of the magnitude of surface contamination of the injured and preliminary estimates of total body dose to the injured. Primary rapid and simple decontamination of the surface of the body (when possible and advisable) before transportation to a designated hospital may be carry out as directed or performed by Radiation Protection personnel. When more professional care is needed, injured persons are transported to a local clinic or hospital. Contaminated and injured persons are transported to a dedicated facility specified for the Site.

3. Medical Service Facilities

Because of the specialized nature of the diagnosis and treatment of radiation injuries, the Licensee maintains an agreement with local hospitals and physicians trained in radiological emergency response. A team of physicians, nurses, health physicists and necessary support personnel on 24-hour call to provide consultative or direct medical or radiological assistance at the {Berwick Hospital Center} or at the accident site. Specifically, the team has expertise in and is equipped to conduct: medical and radiological triage; decontamination procedures and therapies for external contamination and internally deposited radionuclides, including chelation therapy; diagnostic and prognostic assessments or radiation-induced injuries; and radiation dose estimates by methods that include cytogenetic analysis, bioassay, and in vivo counting.

4. Medical Transportation

Arrangements are made by the site for prompt ambulance transport of persons with injuries involving radioactivity to designated hospitals. Such service is available on a 24-hour per day basis and is confirmed by letter of agreement. Radiation monitoring services shall be provided by the Licensee whenever it becomes necessary to use the ambulance service for the transportation of contaminated persons.

A qualified Radiation Protection person shall accompany the ambulance to the hospital. Additional Radiation Protection personnel may be contacted and dispatched to local hospitals to assist in the monitoring and decontamination of the injured victim and hospital and ambulance facilities and personnel.

Section M: Reentry and Recovery Planning

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

1. Reentry and Recovery

a. Evaluating Reentry Conditions

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

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

  All reentry activities conducted during the emergency are authorized by the {Emergency Plant Manager} and coordinated by the {OSC Director} and the {Radiation Protection Manager}.

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

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

The following items are considered when planning for any reentry:

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

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

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

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

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

- Pre-planning of activities and briefings for the reentry team that include the following:

  - Personnel knowledge requirements.
  - Methods and procedures that will be employed during the entry.
  - Specific tasks to be performed.
  - Anticipated radiation and contamination levels.
  - Radiation survey equipment and types and ranges of dosimetry required.
  - Shielding requirements and availability.
  - Appropriate communications.
  - Protective clothing and equipment requirements.
  - Access control procedures.
  - Decontamination requirements.
  - De-briefing requirements.
  - Respiratory protection.

- A review of security controls to prevent unauthorized or unintentional entry into hazardous areas.

b. <u>Evaluating Entry into Recovery</u>

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

Establishment of Recovery can be conducted from any emergency classification level. However, it is possible that the lower classifications of Unusual Event and Alert will conclude with the overall event being terminated. There may be cases where certain EAL initiating conditions remain exceeded, but the plant is under control and no further danger of degradation exists. In such a case, it may be appropriate to enter Recovery. Site Area and General Emergencies will require a Recovery Phase to be established prior to event termination. The Licensee may consult with/notify cognizant governmental agencies prior to entering Recovery or event termination.

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

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

- The risk to the health and safety of the public has been mitigated.
- Plant parameters and equipment status have been established and controlled.
- In-plant radiation levels are stable or decreasing, and acceptable, given the plant conditions.
- The potential for uncontrolled releases of radioactive material to the environment has been eliminated.
- Environmental monitoring has been established.
- The radioactive plume has dissipated and plume tracking is no longer required (the only environmental assessment activities in progress are those necessary to assess the extent of deposition resulting from passage of the plume).
- Licensee workers have been protected.
- Any security threat has been neutralized, and/or plant security is under the direction of Licensee personnel.
- Adequate plant safety systems are operable.
- The reactor is in a stable shutdown condition and long-term core cooling is available.

- The fuel pool damage has been mitigated, or spent fuel damage has been contained and controlled.
- Primary containment integrity has been established.
- Plant systems and equipment are restored and/or replaced such that plant conditions are stable highly unlikely to degrade further.
- Conditions that initiated the emergency have been contained, controlled, eliminated or stabilized such that the classification is no longer applicable.
- The operability and integrity of radioactive waste systems, decontamination facilities, power supplies, electrical equipment and of plant instrumentation including radiation monitoring equipment have been established.
- Any fire, flood, earthquake or similar emergency condition or threat to security no longer exists.
- All required notifications have been made.
- Discussions have been held with federal, {Commonwealth} and local agencies and agreement has been reached to terminate the emergency.
- At an Alert or higher classification, the ERO is in place and emergency facilities are activated.
- Any contaminated injured person has been treated and/or transported to a medical care facility.
- Offsite conditions do not unreasonably limit access of outside support to the site and qualified personnel and support services are available.

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

2. Recovery Organization

Once plant conditions have been stabilized and the Recovery Phase has been initiated, the {Emergency Director} may form a Recovery Organization for long-term operations. These types of alterations should be discussed with the NRC prior to implementation.

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

- For events where damage to the plant has occurred, but no significant offsite impact resulted (i.e., for Alert classifications), the ERO, or portions thereof, and normal site organizations (e.g. outage planning, maintenance, etc.) should be adequate to perform the recovery tasks prior to returning to the normal site organization.

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

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

a. <u>The {Recovery Manager}:</u> The {Emergency Director} is initially designated as the {Recovery Manager}. The {Recovery Manager} is charged with the responsibility for directing the activities of the site recovery organization. These responsibilities include:

   - Ensuring that sufficient personnel, equipment, or other resources from the Licensee and other organizations are available to support recovery.

   - Directing the development of a recovery plan and procedures.

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

   - Coordinating the integration of available federal and {Commonwealth} assistance into onsite recovery activities.

   - Coordinating the integration of Licensee support with federal, {Commonwealth} and local authorities into required offsite recovery activities.

   - Approving information released by the public information organization which pertains to the emergency or the recovery phase of the accident.

   - Determining when the recovery phase is terminated.

b. <u>The {Recovery Plant Manager}:</u> The {Plant Manager} or a designated alternate will become the {Recovery Plant Manager}. The {Recovery Plant Manager} reports to the {Recovery Manager} and is responsible for:

   - Coordinating the development and implementation of the recovery plan and procedures.

- Ensuring that adequate engineering activities to restore the plant, are properly reviewed and approved.
- Directing all onsite activities in support of the site recovery effort.
- Designating other Licensee recovery positions required in support of onsite recovery activities.

c. The {Recovery Offsite Manager}: A senior Emergency Preparedness or {Regulatory Affairs} individual, or a designated alternate, is the {Recovery Offsite Manager}. The {Recovery Offsite Manager} reports to the {Recovery Manager} and is responsible for:

- Providing liaison with offsite agencies and coordinating the Licensee assistance for offsite recovery activities.
- Coordinating Licensee ingestion exposure pathway EPZ sampling activities and the development of an offsite accident analysis report.
- Developing a radiological release report.
- Designating other Licensee recovery positions required in support of offsite recovery activities.

d. The {Company Spokesperson}: A senior management individual is designated as the {Company Spokesperson}. The {Company Spokesperson} reports to the {Recovery Manager} and is responsible for:

- Functioning as the official spokesperson to the press for the Licensee on all matters relating to the accident or recovery.
- Coordinating with all public information groups (federal, {Commonwealth}, local, etc.).
- Coordinating media monitoring and rumor control.
- Determining what public information portions of the ERO will remain activated.

The remainder of the recovery organization is established and an initial recovery plan developed at the end of the emergency phase or just after entry into the recovery phase. Consideration is given to recovery activity needs and use of the normal site organizations. Individual recovery supervisors may be designated in any or all of the following areas:

- Training
- Radiation Protection
- Chemistry

- Technical/Engineering Support
- Quality Assurance and Performance Improvement
- Operations
- Security
- Maintenance
- Special Offsite Areas (Community Representatives, Environmental Samples, Investigations, etc.)

3. Recovery Phase Notifications

When the decision is made to enter the recovery phase, all members of the ERO are informed of the change. All Licensee personnel are instructed of the Recovery Organization and their responsibilities to the recovery effort.

4. Total Population Exposure

Total population exposure calculations are performed and periodically updated during the recovery phase of an accident. A method has been developed for estimating the total population exposure resulting from the accident from data collected in cooperation with the {Commonwealth} and federal agencies. Total population exposure is determined through a variety of procedures including:

- Examination of pre-positioned TLDs.
- Bioassay.
- Estimates based on release rates and meteorology.
- Estimates based on environmental monitoring of food, water, and ambient dose rates.

The {Commonwealth} will be the lead agency in the collection and analysis of environmental air, soil, foliage, food, and water samples and for the generation of radiation monitoring reports. The Licensee environmental sampling activities will be coordinated with {Commonwealth} efforts, as requested, and results shared with cognizant agencies.

Section N: Drill and Exercise Program

This section describes the Drill and Exercise Program that the Licensee has implemented to:

- Verify the adequacy of the Emergency Preparedness Program.
- Develop, maintain, and evaluate the capabilities of the ERO to respond to emergency conditions and safeguard the health and safety of site personnel and the general public.
- Identify deficiencies in the E-Plan and the associated procedures, or in the training of response personnel, and ensure that they are promptly corrected.
- Ensure the continued adequacy of emergency facilities, supplies and equipment, including communications networks.

1. Exercises

a. Biennial Exercises

Federally prescribed exercises are conducted at the site in order to test the adequacy of timing and content of implementing procedures and methods; to test emergency equipment and communication networks; and to ensure that emergency personnel are familiar with their duties. Exercises involving offsite agency participation, required under Section F.2.c & d to 10 CFR 50 Appendix E, are conducted at the site based on FEMA guidance and the respective {Commonwealth} and local emergency response plans.

Partial participation means appropriate offsite authorities shall actively take part in the exercise sufficient to test direction and control functions to include protective action decision making related to Emergency Action Levels and communication capabilities among affected {Commonwealth} and local authorities and the Licensee.

Full participation exercises will include appropriate offsite local and {Commonwealth} authorities and Licensee personnel physically and actively taking part in testing the integrated capability to adequately assess and respond to an accident at the plant. Additionally, full participation exercises will includes testing the major observable portions of the onsite and offsite emergency plans and mobilization of {Commonwealth}, local, and Licensee personnel and other resources in sufficient numbers to verify the capability to respond to the accident scenario.

Where partial or full participation by offsite agencies occurs, the sequence of events simulates an emergency that results in the release of radioactivity to the offsite environs, sufficient in magnitude to warrant a response by offsite authorities.

Since the {BBNPP} has units with different licensees located on the adjacent sites that share most of the elements defining co-located licensees, each licensee shall:

(1) Conduct an exercise biennially of its onsite emergency plan; and

(2) Participate {quadrennially} in an offsite biennial full or partial participation exercise; and

(3) Conduct emergency planning activities and interactions in the years between its participation in the offsite full or partial participation exercise with offsite authorities, to test and maintain interface among the affected {Commonwealth} and local authorities and the licensee.

(4) Participate in emergency preparedness activities and interaction with offsite authorities for the period between exercises.

b. Off-Year Exercises

An Off-Year Exercise is conducted at the site during the calendar year when an NRC Evaluated Exercise is not scheduled. An Off-Year Exercise shall involve a combination of at least two facilities in order to demonstrate at least two of the functions of management and coordination of emergency response, accident assessment, protective action decision-making, or plant system repair and corrective actions. {Commonwealth} and local government agencies may request to participate in Off-Year Exercises and/or drills. For Off-Year Exercises involving no or limited participation by offsite agencies, emphasis is placed on development and conduct of an exercise that is more mechanistically and operationally realistic. Players will be able, by implementing appropriate procedures and corrective actions, to determine the outcome of the scenario to a greater extent than when core damage and the release of radioactivity are prerequisites for demonstration of all objectives.

c. Pre-Exercises

Pre-Exercise Drills may be conducted prior to a Biennial Exercise where FEMA evaluation of {Commonwealth} and local performance is expected. Pre-Exercise Drills may be conducted prior to Off-Year Exercises that only involve the licensee. The Pre-Exercise is a training and experience tool for the participants to sharpen awareness and practice skills necessary to accomplish specific E-Plan duties and responsibilities.

Exercises provide an opportunity to evaluate the ability of participating organizations to implement a coordinated response to postulated emergency conditions. Exercises are conducted to ensure that all major elements of the E-Plan and preparedness program are demonstrated {at least once in each six-year period} and under various weather conditions. (The site shall conduct at least one off-hours exercise between 6:00 p.m. and 4:00 a.m. every cycle (6 years). Weekends and holidays are also considered off-hours periods.} Provisions will be made for qualified personnel from the Licensee, federal, {Commonwealth}, or local governments to observe and critique each exercise as appropriate. The {Commonwealth} should fully participate in the ingestion pathway portion of exercises at least once every six years. {If there is more than one site in the {Commonwealth}, the {Commonwealth} may rotate this participation from site to site.}

2. Drills

In addition to the exercises described above, the Licensee conducts drills for the purpose of testing, developing, and maintaining the proficiency of emergency responders. A schedule of drills is maintained by Emergency Preparedness. The schedule contains provisions for the following drills:

a. Communication Drills

- {Monthly} - The capability of the {Commonwealth} / local notification system to notify the {Commonwealth} and local government warning points and EOCs within the plume exposure pathway EPZ are demonstrated. Also, the capability to notify the NRC is demonstrated monthly using the Emergency Notification System (ENS) and the Health Physics Network (HPN) where available.

- {Quarterly} - The capability to notify the NRC Region, FEMA Region, American Nuclear Insurers (ANI) and federal emergency response organizations as listed in the Emergency Telephone Directory are demonstrated from the EOF. Also, computer and critical communications equipment shall be functionally tested.

- {Annually} - The emergency communications systems outlined in Section F are fully tested. This includes (1) communications between the plant and the {Commonwealth} and local EOCs and Monitoring Teams, and (2) communications between the CR, the TSC, and the EOF.

Each of these drills includes provisions to ensure that all participants in the test are able to understand the content of the messages. Communications drills may be included as part of other drills or exercises.

b. Fire Drills: Fire drills shall be conducted in accordance with the Fire Protection Plan and/or Site procedures.

c. Medical Emergency Drills: A medical emergency drill, involving a simulated contaminated individual, and containing provisions for participation by local support services organizations (i.e., ambulance and support hospital) are conducted {annually}. Local support service organizations, which support more than one plant, shall only be required to participate {once each calendar year}. The offsite portions of the medical drill may be performed as part of the required biennial exercise.

d. Radiological Monitoring Drills: Plant environs and radiological monitoring drills (onsite and offsite) are conducted {annually}. These drills include collection and analysis of all sample media (such as, water, vegetation, soil, and air), and provisions for communications and record keeping.

e. Health Physics Drills: Health Physics Drills involving a response to, and analysis of, simulated airborne and liquid samples and direct radiation measurements within the plant are conducted semi-annually. {At least annually}, these drills shall include a demonstration of the sampling system capabilities, or the core damage assessment objectives as applicable.

f. Augmentation Drills: Augmentation drills serve to demonstrate the capability of the process to augment the on-shift staff with a TSC, OSC and EOF in a short period after declaration of an emergency. These drills are conducted using the following methods:

- {Quarterly} an unannounced off-hours ERO augmentation drill where no actual travel is required.
- {At least once per drill cycle (every 6 years)} an off-hours unannounced activation of the ERO notification system with actual response to the emergency facilities is conducted.

g. Accountability Drills: Accountability drills are conducted {once per drill cycle (every 6 years)}. The drill includes identifying the locations of all individuals within the protected area.

3. Conduct of Drills and Exercises

Advance knowledge of the scenario will be kept to a minimum to allow "free-play" decision making and to ensure a realistic participation by those involved. Prior to the drill or exercise, a package will be distributed to the controllers and evaluators that will include the scenario, a list of performance objectives, and a description of the expected responses.

For each emergency preparedness exercise or drill conducted, a scenario package or lesson plan is developed that includes at least the following:

a. The basic objective(s) of the drill or exercise and the appropriate evaluation criteria.

b. The date(s), time period, place(s), and participating organizations.

c. The simulated events.

d. A master scenario events list.

e. A narrative summary describing the conduct of the scenario to include such things as simulated casualties, offsite fire department assistance, rescue of personnel, use of protective clothing, deployment of radiological monitoring teams, and public information activities.

f. A list of qualified participants.

Prior approval by the appropriate unit management is obtained for all drills and exercises conducted in support of the Emergency Preparedness Program. {BBNPP} should enable any {Commonwealth} or local government located within the plume exposure pathway EPZ to participate in drills when requested by such {Commonwealth} or local government.

4. Critique and Evaluation

Drill and exercise performance objectives are evaluated against measurable demonstration criteria. As soon as possible following the conclusion of each drill or exercise, a critique is conducted to evaluate the ability of the ERO to implement the E-Plan and procedures.

A formal written critique report is prepared by Emergency Preparedness following a drill or exercise involving the evaluation of designated objectives or following the final simulator set with ERO participation. The report will evaluate the ability of the ERO to respond to a simulated emergency situation. The report will also contain corrective actions and recommendations.

Biennially, representatives from the NRC observe and evaluate the licensee’s ability to conduct an adequate self-critical critique. For partial and full offsite participation exercises both the NRC and FEMA will observe, evaluate, and critique.

Critique comments identified by participants during a training drill where objectives are not formally being evaluated will be reviewed and dispositioned by Emergency Preparedness, but do not require a formal report.

5. Resolution of Drill and Exercise Findings

The critique and evaluation process is used to identify areas of the Emergency Preparedness Program that require improvement. The Emergency Preparedness Manager is responsible for evaluation of recommendations and comments to determine which items will be incorporated into the program or require corrective actions, and for the scheduling, tracking, and evaluation of the resolution to the items.

Whenever exercises and/or drills indicate deficiencies in the E-Plan or corresponding implementing procedures, such documents will be revised as necessary.

If required, {BBNPP} will support remedial exercises if the E-Plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency.

Section O: Emergency Response Training

This section describes the emergency response training that is provided to those who may be called upon in an emergency. It outlines the training provided by the Licensee to both its employees and offsite support personnel requiring site access.

1. Assurance of Training

The E-Plan training program assures the training, qualification, and requalification of individuals who may be called on for assistance during an emergency. Specific emergency response task training, prepared for each E-Plan position, is described in lesson plans and study guides. The lesson plans, study guides, and written tests are contained in the ERO Training Program. Responsibilities for implementing the training program are contained in plant procedures. {A description of the content of the training courses is given in an approved station training manual}.

Offsite training is provided to support organizations that may be called upon to provide assistance in the event of an emergency. The following outlines the training received by these organizations:

a. Emergency Preparedness shall {annually train, or document an annual written offer to train}, those non-Licensee organizations that may provide specialized services during a nuclear plant emergency (e.g., local law enforcement, fire-fighting, medical services, transport of injured, etc.). The training made available is designed to acquaint the participants with the special problems potentially encountered during a nuclear plant emergency, notification procedures and their expected roles. Those organizations that must enter the site shall also receive site-specific emergency response training and be instructed as to the identity (by position and title) of those persons in the onsite organization who will control their support activities.

b. Training of offsite emergency response organizations is described in their respective radiological emergency plans, with support provided by the Licensee as requested.

2. Functional Training of the ERO

In addition to general and specialized classroom training, members of the Licensee ERO receive periodic performance based emergency response training. Performance based training is provided using one or more of the following methods:

- Familiarization Sessions: A familiarization session is an informal, organized tabletop discussion of predetermined objectives.
- Walk Throughs: Consists of a facility walk through to familiarize plant ERO personnel with procedures, communications equipment, and facility layout. Walk throughs also provide the opportunity to discuss facility activities, responsibilities and procedures with an instructor.

- Drills: A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular operation. Drills described in Section N of this plan are a part of training. These drills allow each individual to demonstrate the ability to perform their assigned emergency functions. During drills, on-the-spot correction of erroneous performance may be made and a demonstration of the proper performance offered by the Controller.

3. First Aid Response

Selected site personnel are trained in accordance with the Licensee approved First Aid program. First-Aid teams will likely be augmented with additional personnel such as Fire Brigade Members and other personnel qualified to assist in the rescue.

4. Emergency Response Organization Training Program

The Licensee ERO personnel who are responsible for implementing this plan receive specialized training. The training program for emergency response personnel is developed based on the requirements of 10 CFR 50, Appendix E and position specific responsibilities as defined in this document.

On-Shift emergency response personnel perform emergency response activities as an extension of their normal duties and are trained {annually} as part of their duty specific training. Additional Emergency Preparedness information is provided as part of the site General Employee Training.

New ERO personnel receive an initial overview course that familiarizes them with the E-Plan by providing basic information in the following areas as well as specific information as delineated in the sections below:

- Planning Basis
- Emergency Classifications
- Emergency Response Organization and Responsibilities
- Call-out of Emergency Organization
- Emergency Response Facilities
- Communications Protocol/Emergency Public Information
- Offsite Organizations

Emergency response personnel in the following categories receive knowledge and/or performance based training initially and retraining thereafter on a {calendar year} basis:

a. Directors, Managers and Coordinators within the ERO: Personnel identified by the Emergency Telephone Directory as Directors, Managers and Coordinators for the EROs receive training appropriate to their position in accordance with the approved ERO training program. These personnel receive specialized training in the areas of:

- Notifications
- Emergency Classifications
- Protective Action Recommendations
- Emergency Action Levels
- Emergency Exposure Control

Selected Directors, Managers, Coordinators and {Shift Supervisors} receive training in accordance with the approved ERO Training Program. Training in accident assessment sufficient to classify an event and to mitigate the consequences of an event is also covered.

b. Personnel Responsible for Accident Assessment:

The skills and knowledge required to perform plant stabilization and mitigation are a normal function of operations specific positions, as identified in Section B of this plan. Power changes and planned and unplanned reactor shutdowns are handled on a normal operation basis. Subsequent plant stabilization and restoration is pursued utilizing normal operating procedures. Licensed Operators receive routine classroom and simulator training to ensure proficiency in this area.

1) Active Senior Licensed Control Room Personnel shall have training conducted in accordance with the approved ERO training program such that proficiency is maintained on the topics listed below. These subjects shall be covered as a minimum on an annual basis.

- Event Classification.
- Protective Action Recommendations.
- Radioactive Release Rate Determination.
- Notification form completion and use of the {Commonwealth} / local notification system.

- Federal, {Commonwealth} and local notification procedures as appropriate.
- Site specific procedures for activating the onsite and offsite ERO.

To remove peripheral duties from the Operations shift, those positions responsible for accident assessment, corrective actions, protective actions, and related activities receive training.

2) Core Damage Assessment Personnel: During an emergency when core/cladding damage is suspected, a specialized group of trained individuals perform core damage assessment. At a minimum, personnel responsible for core damage assessment receive classroom and hands-on training in the following areas:

- Available Instrumentation and Equipment
- Isotopic Assessment and Interpretation
- Computerized core damage assessment methodology and/or proceduralized assessment methods.

c. Radiological Monitoring Teams and Radiological Analysis Personnel

1) Offsite Radiological Monitoring: Offsite radiological monitoring is performed by trained individuals who provide samples and direct readings for dose assessment calculations and dose projection comparisons.

Personnel identified as members of Monitoring Teams receive training in accordance with the approved training program. Monitoring Team members receive classroom and hands-on training in the following areas:

- Equipment and Equipment Checks
- Communications
- Plume Tracking Techniques

2) Personnel Monitoring: Personnel monitoring is performed by trained individuals who monitor site personnel and their vehicles for contamination during an emergency. Personnel Monitoring Team members receive classroom and hands-on training in the following areas:

- Personnel Monitoring Equipment and Techniques
- Decontamination Techniques for Personnel
- Decontamination Techniques for Vehicles

3) Dose Assessment: Dose Assessment training includes the skills and knowledge necessary for calculation and interpretation of an offsite release and its impact on the environment under varying meteorological conditions. Individuals responsible for performing dose assessment are trained in the following areas:

- Computerized Dose Assessment
- Protective Action Recommendations
- Monitoring Team Interface
- Protective Action Guidelines associated with offsite plume exposure doses
- Basic Meteorology

d. Police, Security, and Fire Fighting Personnel

1) Local Police and Fire Fighting Personnel: The local Police and Fire Departments are invited to receive training as outlined in Part 1.a of this section.

2) Security Personnel: Site security personnel are trained in accordance with training defined by the General Employee Training (GET) and the Licensee Security Plan.

3) Fire Control Teams (fire brigades): Site fire brigades are trained in accordance with training defined by the Licensee Fire Protection Program. Fire Brigade personnel are considered the primary members of rescue teams and will receive the appropriate EP training as part of their training program. Training also includes rescue of personnel from hazardous environments.

e. Repair Teams: Operations, Maintenance and Radiation Protection personnel are trained as part of their normal job specific duties to respond to both normal and abnormal plant operations.

Operations personnel are trained to: (1) recognize and to mitigate degrading conditions in the plant, (2) mechanically and electrically isolate damaged or malfunctioning equipment, (3) isolate fluid leaks, and (4) minimize transients.

Maintenance personnel are trained to troubleshoot and repair damaged or malfunctioning electrical, mechanical, or instrumentation systems as appropriate to their job classification.

Radiation Protection personnel are trained to assess the radiological hazards associated with equipment repair and instruct personnel as to the appropriate protective clothing requirements, respiratory protection requirements, stay times, and other protective actions specific to the conditions present.

{At least 50%} of personnel from those departments, who are potential responders to the OSC as repair team members, are required to be qualified in the use of full face respirators. This includes in-plant supervision and craft/technicians for the following departments:

- Operations
- Radiation Protection
- Chemistry
- Maintenance (mechanical, electrical and I&C)

f. First Aid and Rescue Personnel: First aid and rescue team members receive training as outlined in Part 3 of this section.

g. Local Support Service Personnel: Local support service personnel providing assistance during an emergency are invited to receive training as outline in Parts 1.a and 1.b of this section.

h. Medical Support Personnel: Onsite medical personnel receive specialized training in the handling of contaminated victims and hospital interface. Offsite ambulance and hospital personnel are offered annual training in accordance with a program provided by Emergency Preparedness.

i. Public Information Personnel: Corporate and station personnel responsible for disseminating emergency public information and responding to media and public information requests receive specialized public information training.

j. Communications Personnel: ERO personnel receive training on communications protocol as a part of the initial Emergency Response Overview Course. Personnel using specialized communications equipment that is not part of their normal daily function receive initial and requalification training on the equipment. Personnel involved in notifications to offsite agencies receive specialized training in the notification process.

5. General, Initial, and Annual Training Program Maintenance

a. Station departments and Emergency Preparedness share the responsibility for ensuring that the ERO receives all necessary training and retraining. In order to carry this out, responsibilities are assigned as follows:

Responsibilities for Emergency Preparedness

- Scheduling and conducting initial, retraining, and make-up classes.
- Acting as the contact point for ensuring attendance.
- Record keeping for the training courses, including dates of scheduled classes and non-attendance information.

- Verifying that all emergency response personnel training records are current.
- Ensure instructional materials are prepared and reviewed every two years.

Responsibilities for other Plant ERO Personnel

- Site management shall ensure the attendance of onsite personnel for training, including required E-Plan courses.
- The Site shall conduct onsite emergency personnel initial and retraining for site Emergency Response Personnel using approved lesson plans.
- The Site Training Department(s) shall provide those shift personnel included in a continuing training program an annual review of the following items as a minimum:
  - Assembly Areas
  - Emergency Response Facility assignment
  - Potential Hazards (radiological and non-radiological)
  - Anticipated actions including assembly requirements, protective equipment requirements (clothing, masks, SCBA, etc.), the use of KI, emergency exposure limits and accountability requirements.

b. Initial and Requalification ERO Training: The proficiency of emergency response personnel (as defined in 10 CFR 50 Appendix E) is ensured by the following means:

- Assigning persons to emergency duties that are similar to those performed as a part of their regular work assignment or experience.
- Initial training and annual retraining on applicable generic and site-specific portions of the E-Plan and the corresponding implementing procedures. Individuals not demonstrating the required level of knowledge in initial or retraining classes receive additional training on the areas requiring improvement. {Annual retraining is conducted on a calendar year basis.}
- Participation in exercises and/or drills as developed or authorized by the Emergency Preparedness Department and designed to sharpen those skills that they are expected to use in the event of a nuclear emergency.

All personnel assigned position specific responsibilities in the ERO are documented by inclusion in the Emergency Telephone Directory listing of positions and personnel.

c. General Employee Training (GET): All personnel with unescorted site access are provided with initial orientation training on the notification and instruction methods used in the event of an emergency. Additionally, all badged individuals also receive initial orientation on the basic principles of radiological safety including the effects of radiation and the theory and use of radiation detection devices. Appropriate actions for escorted individuals shall be the responsibility of the escort. GET provides initial and annual requalification training on the basic elements of the E-Plan for all personnel working at the plant. Specifically, these elements include:

- Site emergency alarms and their meaning
- Assembly areas
- Site and Exclusion Area Evacuation procedures
- Special precautions and limitations during an emergency
- Purpose of the E-Plan

Section P: Responsibility for the Maintenance of the Planning Effort

This section describes the responsibilities for development, review and distribution of the E-Plan and actions that must be performed to maintain the emergency preparedness program. It also outlines the criteria for insuring that personnel who perform the planning are properly trained.

1. Emergency Preparedness Staff Training

The Emergency Preparedness staff is involved in maintaining an adequate knowledge of state of the art planning techniques and the latest applications of emergency equipment and supplies. {At least once each calendar year each member of the Emergency Preparedness staff is involved in one of the following activities:}

- {Training courses specific or related to emergency preparedness.}
- {Observation of or participation in drills and/or exercises at other stations.}
- {Participation in industry review and evaluation programs.}
- {Participation in regional or national emergency preparedness seminars, committees, workshops or forums.}

2. Authority for the Emergency Preparedness Effort

The {Site Vice President} is responsible for the safe and reliable operation of the {BBNPP} unit. The issuance and control of this plan and the activities associated with emergency preparedness at {BBNPP} shall be the overall responsibility of the {Site Vice President}. These individuals are assigned the responsibility for overall implementation of the Licensee E-Plan and Unit Annex for {BBNPP}.

3. Responsibility for Development and Maintenance of the Plan

The {Emergency Preparedness Manager} is responsible for the overall radiological emergency preparedness program associated with the operation of the nuclear power plant and to administer the program to ensure availability of resources in the event of an emergency.

The {Emergency Preparedness Manager} is assisted by an Emergency Preparedness Staff. Specific responsibilities include the following:

Program Administration

- Develop and maintain the E-Plan, Unit Annex, implementing procedures and administrative documents.
- Develop and maintain 10 CFR 50.54(q) evaluations for changes to EP documents.

- Develop and maintain working relationships and coordinate meetings with Federal, {Commonwealth} and Local agencies.
- Ensure integration of plans between the Licensee and offsite agencies.
- Provide an opportunity to discuss Emergency Action Levels and the availability of {quality assurance} audit results relating to interface with governmental agencies.
- Coordinate, negotiate and maintain agreements and contracts with offsite agencies and support organizations.
- Obtain Letters of Agreement with major medical facilities, and medical consultants specifically skilled in the medical aspects of radiation accidents and other medical consultants as might be necessary for the case of a person involved in a radiation incident.
- Coordinate the development and annual distribution of the {BBNPP} public information publication.
- Coordinate and support EP Self-Assessments, Audits and Inspections.
- Ensure the documentation and resolution of adverse conditions in the emergency preparedness program discovered through drills, audits, etc. in accordance with the Licensee Corrective Action Program.
- Coordinate and develop Operational Experience responses.
- Coordinate, document and review Performance Indicator data and reports.
- Provide oversight of Drill and Exercise Performance (DEP) evaluations during License Operator Requalification (LOR) Training.
- Coordinate and conduct EP Event reviews and reports.
- Maintain adequate documentation/files to support EP activities.
- Develop and manage the EP budget.
- Maintain the Emergency Telephone Directory.

<u>Inter-Unit Coordination</u>

Coordinate with {Susquehanna Steam Electrical Station (SSES) Unit 1 and 2} Emergency Preparedness Staff to ensure:

- Consistency in planning with offsite authorities.
- Consistency in providing Emergency Preparedness information to the public.
- Operations and Maintenance of shared Emergency Plan equipment / facilities.

- Site wide protective actions (notifications, assembly, evacuation, etc) including Security's actions.
- Proper scheduling of Full Participation Exercises.

Drills and Exercises

- Coordinate and maintain the EP Drill and Exercise Schedule.
- Coordinate and conduct exercises and drills.
- Coordinate NRC, FEMA, {Commonwealth}, and local exercise scheduling and development activities.
- Coordinate drill and exercise scenario development activities.
- Develop and publish drill and exercise scenario manuals.
- Coordinate and perform controller and evaluator functions for drills and exercises.
- Coordinate response cells for drills and exercises.
- Develop and issue drill and exercise reports.

Facilities and Equipment

- Provide maintenance and administration of the {Public Notification System (PNS)}.
- Provide maintenance of the ERO call-out system.
- Ensure the Emergency Response Facilities are maintained in a constant state of readiness.
- Coordinate and review the EP equipment inventories.
- Coordinate and conduct maintenance and testing of the communications systems.
- Maintain the EP computer applications.

ERO Qualification and Administration

- Develop and maintain ERO Lesson Plans, Examinations, and Qualification Cards.
- Maintain EP GET training content.
- Coordinate, schedule and conduct ERO qualification and requalification training.

- Oversee the maintenance of ERO training records.
- Maintain and coordinate publishing of the ERO Duty Rosters.
- Provide adequate oversight and support for the training of offsite response personnel.
- Coordinate conduct of Emergency Medical Assistance Program training.
- Coordinate annual training for the media.

4. Emergency Plan and Agreement Revisions

The E-Plan, its Unit Annex, and supporting Agreements are reviewed on an annual basis. This review may also include applicable {Commonwealth} and local emergency response agencies based on established agreements.

The {annual} E-Plan review/update includes required changes identified during audits, assessments, training, drills, and exercises. The Emergency Preparedness Manager is responsible for determining which recommended changes are incorporated into a plan or emergency procedure revision. {In those years when the review does not warrant a revision, a letter to that affect will be issued.}

The E-Plan and its Annex shall be revised as needed and the most current approved revisions shall remain in effect so long as they are certified as current. Revisions to the E-Plan are reviewed by the Sites' {plant oversight review committee/independent review committee} prior to approval. Changes to the plan are made without NRC approval only if such changes do not decrease the effectiveness of the plan per 10 CFR 50.54(q) and the plan as changed continues to meet the standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E. Proposed changes that decrease or have a potential to decrease the effectiveness of the approved plan are not implemented without prior approval by the NRC.

- Proposed revisions to the E-Plan and Unit Annex shall be completed in accordance with the Licensee review and approval processes.
- E-Plan and Unit Annex changes shall be categorized as (1) minor/ administrative or (2) significant programmatic changes. Minor/administrative changes shall be implemented {within 30 days} of approval. Significant programmatic changes shall be implemented as soon as practical and {within 60 days} of final approval.
- After review and approval, the E-Plan and Unit Annex shall be:

    a) Reviewed by the {Emergency Preparedness Manager} or designee, and

    b) Approved for use by the {Site Vice President}, or designee.

- The Implementing Procedures shall be developed and revised concurrent with the E-Plan and Unit Annex, and reviewed every {two years}.

{Annually}, each Letter of Agreement is reviewed and verified current in order to assure the availability of assistance from each supporting organization not already a party to the individual {Commonwealth} and/or local emergency plan.

5. Emergency Plan Distribution

E-Plan manuals, Unit Annex and implementing procedures are distributed as necessary on a controlled basis to the Emergency Response Facilities. All controlled documents holders are issued revision changes upon approval. Selected Federal, {Commonwealth}, and local agencies, and other appropriate locations requiring them are also issued copies. Procedures are in place that control the revision of the E-Plan and {require the use of revision bars and individual page identifications (i.e. section of plan, revision number, date of revision, etc.)}.

6. Supporting Emergency Response Plans

Other plans that support this E-Plan are:

- NUREG-1471, US Nuclear Regulatory Commission, "Concept of Operations: NRC Incident Response"
- National Response Plan
- {10 Mile (16 Kilometer) EPZ State Plan(s), see section A.1 of this plan for detailed listing of state/commonwealth plans.}
- {10 Mile (16 Kilometer) EPZ Local Community Plan(s), see section A.1 of this plan for detailed listing of local plans.}
- {50 Mile (80 Kilometer) EPZ State Plan(s), see section A.1 of this plan for detailed listing of state/commonwealth plan(s).}
- Department of Energy, Region 1, “Radiological Assistance Plan"
- INPO Emergency Resources Manual.
- {Bell Bend Nuclear Power Plant Security Plan} - Note: The Security Plan contains safeguards information that must be protected from unauthorized disclosure under provisions of 10 CFR 73.21.

7. Implementing and Supporting Procedures

Appendix 2 of this plan contains a listing, by number and title, of those procedures that implement this plan during an emergency. Additionally, administrative procedures that outline the steps taken to maintain the {BBNPP} Emergency Preparedness Program have been developed and are listed in Appendix 2.

8. Cross Reference to Planning Criteria

The Plan contains a table of contents and is formatted in the same manner as NUREG-0654, FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in support of Nuclear Power Plants." The use of this format lends itself to uncomplicated comparison of the criteria set forth in NUREG-0654, FEMA-REP-1.

Appendix 1, References provides cross references of other planning standards to section of the plan.

9. Audit/Assessment of the Emergency Preparedness Program

To meet the requirements of 10 CFR 50.54(t), the Licensee shall coordinate an independent review of the Emergency Preparedness Program {at least every 12 months} to examine conformance with 10 CFR 50.47, 10 CFR 50.54, and 10 CFR 50 Appendix E. Included in the audit/assessment are the following:

- The E-Plan and associated implementing procedures.
- The Emergency Preparedness training program including drills and exercises.
- The readiness of the {BBNPP} ERO(s) to perform its function.
- The readiness of facilities and equipment to perform as outlined in the plan and procedures.
- The interfaces between the Licensee, the {Commonwealth}, and local governmental agencies pertaining to the overall Emergency Preparedness Program.

Results of this audit are submitted for review to Site Management and the {Site Vice President}. The {Emergency Preparedness Manager} ensures that any findings that deal with offsite interfaces are reviewed with the appropriate agencies. Written notification will be provided to the appropriate {Commonwealth} and local authorities of the performance of the audit and the availability of the audit records for review at the Licensee facilities. Management controls shall be implemented for evaluation and correction of review findings. Records of the audit are maintained for {at least five years}.

10. Maintenance of Emergency Telephone Directory

Names and phone numbers of the Emergency Response Organization and support personnel shall be reviewed and updated at least quarterly.

PART III: Appendices

Appendix 1: References

References consulted in the writing of this E-Plan are listed in this section. With exception of regulatory requirements, inclusion of material on this list does not imply adherence to all criteria or guidance stated in each individual reference.

Guidance	Cross Reference / Use
1. 10 CFR 50.47, Emergency Plans	Entire Plan
2. 10 CFR 50.54, Conditions of Licenses	Plan Section P-4
3. 10 CFR 50.72, Immediate Notification Requirements for Operating Nuclear Power Reactors	Plan Section E
4. 10 CFR 50.73, Licensee Event Report System	Plan Section D-2
5. 10 CFR 50 Appendix E, Emergency Planning and Preparedness for Production and Utilization Facilities	See Table App1-1 at end of this section
6. 10 CFR 20, Standards for Protection Against Radiation	Section K
7. 10 CFR 73.21, Requirements for Protection of Safeguards Information.	Plan reviewed to ensure no Safeguards Information improperly included.
8. NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, November, 1980.	This plan is formatted to match NUREG-O654 numbering.
9. NUREG-0654, Supplement 3, "Criteria for Protective Action Recommendations for Severe Accidents," July 1996.	Section J
10. NUREG-0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," December 1978.	Section A-2 and Section B-7
11. NUREG-0696, Revision 1, Functional Criteria for Emergency Response Facilities, February 1981.	Section H

Guidance	Cross Reference / Use
12. US NRC Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," Revision 4, July, 2003.	Section D-2
13. U.S. NRC Response Technical Manual (RTM-96), 1996.	Section C
14. EPA 400-R-92-001, October 1991, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents."	Section J-7 through J-10
15. FEMA-REP-10, “Guide for Evaluation of Alert and Notification Systems for Nuclear Power Plants,” November, 1985.	Section E-6
16. FEMA-REP-14, “Exercise Evaluation Methodology,” 1991.	Section N-4
17. FEMA-Guidance Memorandum, “MS-1 "Medical Services," November, 1986.	Section L-1
18. INPO Emergency Resources Manual	Section P-6
19. "Maintaining Emergency Preparedness Manual," dated December, 1996 INPO 96-009.	Section P
20. Comprehensive Environmental Response, Compensation and Liability Act of 1980.	Section B-8
21. American Nuclear Insurers Bulletin #5B (1981), "Accident Notification Procedures for Liability Insureds".	Section B-8
22. ANI/MAELU Engineering Inspection Criteria For Nuclear Liability Insurance, Section 6.0, Rev. 1, "Emergency Planning."	Section B-8
23. "Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency: Final Recommendations on Use," Federal Register Vol. 47, No. 125, June 29, 1982.	Section J-6

Guidance	Cross Reference / Use
24. INPO Coordination agreement on emergency information among USCEA, EPRI, INPO, NUMARC and their member utilities, dated April (1988).	Section A-3
25. EPPOS No. 2, Rev. 0, “Timeliness of Classification of Emergency Condition,” August 1, 1995.	Section D
26. EPPOS No. 3, Rev. 0, “Requirement for Onshift Dose Assessment Capability, November 8, 1995.	{ Annex} Table B-1a
27. EPPOS No. 5, Rev. 0, “Emergency Planning Information Provided to the Public,” December 4, 2002.	Section G
28. Regulatory Issue Summary (RIS) 2000-08, “Voluntary Submission of Performance Indicator Data,” March 29, 2000 (ADAMS Accession No. ML003685821).	Section P-3
29. RIS 2000-11, “NRC Emergency Telecommunications System,” June 30, 2000 (ADAMS Accession No. ML003727812).	Section F-1
30. RIS 2000-11, Supp. 1, “NRC Emergency Telecommunications System,” March 22, 2001 (ADAMS Accession No. ML010570103).	Section F-1
31. RIS 2001-16, “Update of Evacuation Time Estimates,” August 1, 2001 (ADAMS Accession No. ML012070310).	Section J-8
32. RIS 2003-12, “Clarification of NRC Guidance for Modifying Protective Actions,” June 24, 2003 (ADAMS Accession No. ML031680611).	Section J-10
33. RIS 2003-18, “Use of NEI 99-01, “Methodology for Development of Emergency Action Levels,” Revision 4, Dated January 2003,” October 8, 2003 (ADAMS Accession No. ML032580518).	Section D

Guidance	Cross Reference / Use
34. RIS 2003-18, Supp. 1, “Supplement 1, Use of Nuclear Energy Institute (NEI) 99-01, “Methodology for Development of Emergency Action Levels,” Revision 4, Dated January 2003,” July 13, 2004 (ADAMS Accession No. ML041550395).	Section D
35. RIS 2003-18, Supp. 2, “Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, “Methodology for Development of Emergency Action Levels,” Revision 4, Dated January 2003,” December 12, 2005 (ADAMS Accession No. ML051450482).	Section D
36. RIS 2005-02, “Clarifying the Process for Making Emergency Plan Changes,” February 14, 2005 (ADAMS Accession No. ML042580404).	Section P-4
37. RIS 2005-08, “Endorsement of Nuclear Energy Institute (NEI) Guidance “Range of Protective Actions for Nuclear Power Plant Incidents”,” June 6, 2005 (ADAMS Accession No. ML050870432).	Section J-10
38. RIS 2006-03, “Guidance on Requesting an Exemption from Biennial Emergency Preparedness Exercise Requirements,” February 24, 2006 (ADAMS Accession No. ML053390039).	Section N-1
39. RIS 2006-12, “Endorsement of Nuclear Energy Institute Guidance “Enhancements to Emergency Preparedness Programs for Hostile Action”,” July 19, 2006 (ADAMS Accession No. ML061530290).	Section D
40. IN 85-44, “Emergency Communication System Monthly Test,” May 30, 1985.	Section F-1.f
41. IN 86-98, “Offsite Medical Services,” December 2, 1986.	Section L-1
42. IN 87-58, “Continuous Communications Following Emergency Notification,” November 16, 1987.	Section E-4

Guidance	Cross Reference / Use
43. IN 88-15, "Availability of U.S. Food and Drug Administration (FDA)-Approved Potassium Iodide for Use in Emergencies Involving Radioactive Iodine," April 18, 1988.	Section J-6.c
44. IN 93-81, "Implementation of Engineering Expertise on Shift," October 12, 1993.	Section B-1
45. IN 02-14, "Ensuring a Capability to Evacuate Individuals, Including Members of the Public, from the Owner-Controlled Area," April 8, 2002.	Section J-2

Table App 1-1, 10 CFR 50 Appendix E, Cross Reference		
AppE #	**STATEMENT**	**PLAN Section**
IV A.	The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensees emergency organization and the means for notification of such individuals in the event of an emergency.	B
IV A.1	A description of the normal plant operating organization.	B.1
IV A.2.a	A description of the onsite emergency response organization with a detailed discussion of: Authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency;	B.2, B.3, B.4 B.5
IV A2.b	Plant staff emergency assignments;	B.5
IV A2.c	Authorities, responsibilities, and duties on an onsite emergency coordinator who shall be in charge of the exchange of information with offsite authorities responsible for coordinating and implementing offsite emergency measures.	B.5
IV A.3	A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.	B.5.b, B7
IV A.4	Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.	B.5.a.12 B.5.b.7 B.5.b.8
IV A.5	Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The special qualifications of these persons shall be described.	B.5 B.8
IV A.6	A description of the local offsite services to be provided in support of the licensee's emergency organization.	B.9
IV A.7	Identification of, and assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies.	A.1 A.2
IV A.8	Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.	A.1
IV B	The means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. These emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by NRC. They shall also be reviewed with the State and local governmental authorities on an annual basis.	I.4 D { Annex}

Table App 1-1, 10 CFR 50 Appendix E, Cross Reference		
AppE #	**STATEMENT**	**PLAN Section**
IV C	The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described. The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described. Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as the pressure in containment and the response of the Emergency Core Cooling System) for notification of offsite agencies shall be described. The existence, but not the details, of a message authentication scheme shall be noted for such agencies. The emergency classes defined shall include: (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency. These classes are further discussed in NUREG - 0654; FEMA - REP - 1.	E
IV D.1	Administrative and physical means for notifying local, State, and Federal officials and agencies and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary, shall be described. This description shall include identification of the appropriate officials, by title and agency, of the State and local government agencies within the EPZs.	F
IV D.2	Provisions shall be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.	G.1
IV D.3	A licensee shall have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency. The design objective of the prompt public notification system shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this notification capability will range from immediate notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the State and local governmental officials to make a judgment whether or not to activate the public notification system. Where there is a decision to activate the notification system, the State and local officials will determine whether to activate the entire notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public notification system shall remain with the appropriate governmental authorities.	E
IV 4.E.1	Adequate provisions shall be made and described for emergency facilities and equipment, including: Equipment at the site for personnel monitoring;	H
IV 4.E.2	Equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment;	H
IV 4.E.3	Facilities and supplies at the site for decontamination of onsite individuals;	H
IV 4.E.4	Facilities and medical supplies at the site for appropriate emergency first aid treatment;	L.2
IV 4.E.5	Arrangements for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site;	L.3
IV 4.E.6	Arrangements for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary;	L.4
IV 4.E.7	Arrangements for treatment of individuals injured in support of licensed activities on the site at treatment facilities outside the site boundary;	L.1

Table App 1-1, 10 CFR 50 Appendix E, Cross Reference		
AppE #	**STATEMENT**	**PLAN Section**
IV 4.E.8	A licensee onsite technical support center and a licensee near-site emergency operations facility from which effective direction can be given and effective control can be exercised during an emergency;	H.1 H.2
IV 4.E.9	At least one onsite and one offsite communications system; each system shall have a backup power source. All communication plans shall have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and backup means of communication.	F.1
IV 4.E.9.a	Where consistent with the function of the governmental agency, these arrangements will include: Provision for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested monthly.	F.3 N.2.a
IV 4.E.9.b	Provision for communications with Federal emergency response organizations. Such communications systems shall be tested annually.	N.2.a
IV 4.E.9.c	Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.	N.2.a
IV 4.E.9.d	Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations facility. Such communications shall be tested monthly.	N.2.a
IV F.1.i	The program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel: Directors and/or coordinators of the plant emergency organization;	O.4.a
IV F.1.ii	Personnel responsible for accident assessment, including control room shift personnel;	O.4.b
IV F.1.iii	Radiological monitoring teams;	O.4.c
IV F.1.iv	Fire control teams (fire brigades);	O.4.d
IV F.1.v	Repair and damage control teams;	O.4.e
IV F.1.vi	First aid and rescue teams;	O.4.f
IV F.1.vii	Medical support personnel;	O.4.h
IV F.1.viii	Licensee's headquarters support personnel;	O.4.i
IV F.1.ix	Security personnel.	O.4.d
IV F.1	In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/Civil Defense, local law enforcement personnel, local news media persons.	O.4.g

Table App 1-1, 10 CFR 50 Appendix E, Cross Reference		
AppE #	**STATEMENT**	**PLAN Section**
IV F.2	The plan shall describe provisions for the conduct of emergency preparedness exercises as follows: Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, test the public notification system, and ensure that emergency organization personnel are familiar with their duties.	N.1
IV F.2.a	A full participation exercise which tests as much of the licensee, State and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted for each site at which a power reactor is located.	N.1
IV F.2.b	Each licensee at each site shall conduct an exercise of its onsite emergency plan every 2 years. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this section. In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities.	N.1
IV F.2.c	Offsite plans for each site shall be exercised biennially with full participation by each offsite authority having a role under the plan. Where the offsite authority has a role under a radiological response plan for more than one site, it shall fully participate in one exercise every two years and shall, at least, partially participate in other offsite plan exercises in this period.	N.1
IV F.2.d	A State should fully participate in the ingestion pathway portion of exercises at least once every six years. In States with more than one site, the State should rotate this participation from site to site.	N.1
IV F.2.e	Licensees shall enable any State or local Government located within the plume exposure pathway EPZ to participate in the licensee's drills when requested by such State or local Government.	N.1.b
IV F.2.f	Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency. The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.	N.5
IV F.2.g	All training, including exercises, shall provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified shall be corrected.	N.4 O.1
IV F.2.h	The participation of State and local governments in an emergency exercise is not required to the extent that the applicant has identified those governments as refusing to participate further in emergency planning activities, pursuant to 10 CFR 50.47(c)(l). In such cases, an exercise shall be held with the applicant or licensee and such governmental entities as elect to participate in the emergency planning process.	N.1.a
IV G	Provisions to be employed to ensure that the emergency plan, its implementing procedures, and emergency equipment and supplies are maintained up to date shall be described.	P
IV H	Criteria to be used to determine when, following an accident, reentry of the facility would be appropriate or when operation could be resumed shall be described.	M

Appendix 2: Procedure Cross-Reference to NUREG-0654

Criteria	Planning Standard	Procedure/Document
NUREG-0654.II.A	Assignment of Responsibility (Organization Control)	{EPIP-100, Emergency Plan General Response}
NUREG-0654.II.B	Onsite Emergency Organization	{EPIP-200, Control Room Emergency Response}
		{EPIP-210, TSC Activation and Operation}
		{EPIP-220, OSC Activation and Operation}
		{EPIP-230, EOF Activation and Operation}
		{EPIP-240, JIC Activation and Operation}
NUREG-0654.II.C	Emergency Response Support and Resources	Details provided in {EPIP-2xx series, facility procedures. }
NUREG-0654.II.D	Emergency Classification System	{EPIP-300, Emergency Classification}
NUREG-0654.II.E	Notification Methods and Procedures	{EPIP-400, Emergency Notifications}
NUREG-0654.II.F	Emergency Communications	Details provided in {EPIP-2xx series, facility procedures. }
NUREG-0654.II.G	Public Education and Information	{EPIP-901, Emergency Plan Public Information Program}
NUREG-0654.II.H	Emergency Facilities and Equipment	{EPIP-700, Emergency Plan Equipment Operation}
		{EPIP-903, Maintenance of Emergency Response Facilities.}
		{EPIP-906, Siren Maintenance and Testing}
NUREG-0654.II.I	Accident Assessment	{EPIP-500, Core Damage Assessment}
		{EPIP-510, Dose Assessment}
		Position specific details provided in {EPIP-2xx series, facility procedures. }
NUREG-0654.II.J	Protective Response	{EPIP-600, Protective Action Recommendations}
		{EPIP-610, Onsite Protective Actions}
NUREG-0654.II.K	Radiological Exposure Control	{EPIP-620, Emergency Exposure Controls}
NUREG-0654.II.L	Medical and Public Health Support	{EPIP-630, Health Physics Hospital Assistance}
NUREG-0654.II.M	Recovery and Reentry Planning and Post-Accident Operations	{EPIP-800, Reentry and Recovery}

PART III: Appendices

Criteria	Planning Standard	Procedure/Document
NUREG-0654.II.N	Exercises and Drills	{EPIP-905, Exercises, Tests and Drills}
NUREG-0654.II.O	Radiological Emergency Response Training	{EPIP-904, Emergency Response Training}
NUREG-0654.II.P	Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans	{EPIP-900, Emergency Preparedness Administration}
		{EPIP-902, Maintenance of Emergency Plan Records}
		{EPIP-907, Emergency Plan Performance Indicators}

Appendix 3: Letters of Agreements (Certification Letters)

Letters of agreement (Certification Letters) have been established with the following support organizations:

1. {Berwick Ambulance Association
2. Berwick Hospital Center
3. East Berwick Hose Company No. 2
4. The Geisinger Medical Center
5. Hobbie Volunteer Fire Company
6. Hunlock Creek Volunteer Ambulance Association
7. Mocanaqua Volunteer Fire Company
8. Nescopeck Community Ambulance Association
9. Pond Hill-Lily Lake Ambulance Association}
10. PA State Police Troop P Headquarters at Wyoming
11. Reliance Fire Company No. 1
12. Salem Township Fire Company #1
13. Shickshinny Volunteer Ambulance
14. Shickshinny Volunteer Fire Company}

Thomas R. Derby III
Supervisor
2018 North Vine Street
Berwick, PA 18603
(570) 752-5321 – firemedic194@yahoo.com

Berwick Area Ambulance Association

August 15, 2008

Dear Mr. Price,

I have received your letter in regards to the UniStar Nuclear Energy Services LLC and PPL Nuclear Development, LLC proposed U.S. Evolutionary Power Reactor to be located near the existing SSES Units 1 and 2 in Salem Township, PA. This letter is to inform you that Berwick Area Ambulance Association will be committed to responding to any emergency as required by the laws set forth by the PA Department of Health. These responses will include, but not limited to, any response for medical emergencies, traumatic emergencies, or hazardous emergencies provided we are dispatched properly through the local PSAP (911 Centers) and providing that our responding units are not actively on another incident elsewhere in our coverage area. We will also remain active in any training and scenario based training, on site or off, providing our availability and providing we receive advanced notice as we have done in the past. If you have any questions, please feel free to contact me using the information provided above.

Sincerely,

Thomas R. Derby III
Supervisor
Berwick Area Ambulance Association

BERWICK HOSPITAL CENTER

July 30, 2008

John Price – COL Application Coordinator
UniStar Nuclear Energy
100 Constellation Way
Suite 1400P
Baltimore, MD 21202-3106

Reference: UniStar Nuclear Energy Services, LLC and PPL Nuclear Development, LLC Combined License Application Letter of Agreement

Dear Mr. Price,

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Berwick Hospital Center is committed to participating in any further development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities as a designated primary support hospital for providing tentative outpatient and/or inpatient care for station personnel injuries involving radiation exposure or contamination under the existing Letter of Agreement attached.

Sincerely,

John Kristel

John Kristel, CEO

701 E. 16th Street, Berwick, Pennsylvania 18603 (570) 759-5000 FAX (570) 759-3473

East Berwick Hose Co #2

637 East 5th St
Berwick, Pa 18603
Salem Township Luzerne County
Office of the Chief

Dear Mr. Price:

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, Pa, the East Berwick Hose Company No. 2 is committed to participating in any further development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities for providing fire fighting assistance, including personnel and equipment, under the existing Letter of Agreement attached.

Sincerely,

Chief Brice Dalrymple
Station 274, Luzerne County

Security Department
M.C. 01-44
100 North Academy Avenue
Danville, PA 17822
570 271 5631 Tel
570 271 7479 Fax

Scott Bitting, MPA, CHPA
Director, Security & Emergency
Management Services
Geisinger Health System

GEISINGER
HEALTH SYSTEM

September 23, 2008

John Price
Unistar Nuclear Energy
COL Application Coordinator
Baltimore, MD 21202

Dear Mr. Price,

Geisinger Medical Center has a long-standing partnership with our community in disaster / emergency management planning and response. For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Geisinger Medical Center is committed to participating in the further development of emergency management and emergency response plans.

Geisinger Medical Center will work with UNES and PPL to identify any needed changes related to the execution of our responsibilities as a designated back up support medical facility for providing tentative outpatient and/or inpatient care for station personnel injuries involving radiation exposure or contamination under our existing letter of agreement. This commitment includes participation in field and classroom training, emergency drills, and exercises / field demonstrations.

Any questions or requests for additional details concerning our current emergency response plans may be addressed to my attention at the Geisinger Medical Center. It is our desire to continue to maintain and enhance our partnership in emergency management planning and response that exists with our community partners such as UNES and PPL.

Sincerely,

Scott J. Bitting

Scott J. Bitting, MPA, CHPA
Chairman, Emergency Management Committee
Director, Security and Emergency Management Services
September 19, 2008

SJB/kb

HOBBIE VOLUNTEER FIRE CO # 1
655 EAST COUNTY ROAD
WAPWALLOPEN, PA 18660
PHONE: 570-379-3013 FAX: 570-379-3013

August 5, 2008

Dear Mr. Price:

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Hobbie Volunteer Ambulance is committed to participating in any further development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities to transport patients from the station who may have injuries complicated with radioactive contamination or who may have been involved in a radiation incident under the existing Letter of Agreement attached.

Sincerely,
Arthur P. Blake
Arthur P. Blake

Captain, Hobbie EMS

HUNLOCK CREEK VOLUNTEER
AMBULANCE ASSOCIATION
P.O.BOX 35
HUNLOCK CREEK, PA. 18621

PHONE 570-542-7958

FAX 570-542-7865

Dear Mr. Price,

For the UniStar Nuclear Energy Services (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1&2(SSES) in Salem Twp. , PA, the Hunlock Creek Volunteer Ambulance Association is commited to participating in any further development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities to transport patients from the station who may have injuries complicated with radioactive contamination, or who may have been involved in a radiation incident under the existing Letter of Agreement attached.

Sincerely,

George Price

George Price,Business Mgr.

Hunlock Creek Volunteer Ambulance

Mocanaqua Volunteer Fire Company # 1, INC.

Luzerne County Pennsylvania

	Post Office Box 73 Shickshinny, PA 18655	Phone/Fax 570-542-2231 Email: Mocanaquafire@yahoo.com
	Fire Chief Stephen A McDaniels	

Dear Mr. Price:

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evoluntionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Mocanaqua Volunteer Fire Company is commited to participating in any further development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities for providing firefighting assistance, including personnel and equipment, under the existing Letter of Agreement attached.

If you have any questions please feel free to contact me at (570) 760-1246.

Sincerely,

Stephen A McDaniels
Fire Chief
Mocanaqua Volunteer Fire Company

NESCOPECK COMMUNITY AMBULANCE ASSOCIATION

P O BOX 159 • 99 Warren Street • Nescopeck, PA 18635

July 31, 2008

Dear Mr. Price;

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units l and 2 (SSES) in Salem Township, Pa. the Nescopeck Community Ambulance Assoc. is committed to participating in any further development of the emergency response plans, including any required training and field demonstrations, and work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities to transport patients from the station who may have injuries complicated with radioactive contamination or who may have been involved in a radiation incident under the existing Letter of Agreement attached.

Sincerely,

John Kertesz, President

John Kertesz, President

UniStar
NUCLEAR ENERGY

100 Constellation Way, Suite 1400P
Baltimore, MD 21202
(410) 470-5531

July 16, 2008

Pond Hill-Lily Lake Ambulance Association
56 Cemetery Road
Wapwallopen, PA 18660

Reference: UniStar Nuclear Energy Services, LLC and PPL Nuclear Development, LLC Combined License Application Letter of Agreement

Dear Mr. Stettler:

UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) are submitting a Combined License (i.e., COL) application for a U.S. EPR nuclear power plant to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, Pennsylvania. Submittal of this application does not mean that a decision to build another nuclear power plant at the SSES site has been made. As part of the COL application process, the U.S. Nuclear Regulatory Commission (NRC) requires that the application include copies of letters of agreement (or other form of communication) from the State and local governmental agencies with possible emergency planning responsibilities for the proposed new plant.

UNES and PPL are expecting to complete our submittal of the COL application by the third quarter of this year. Therefore, we respectfully request your response acknowledging your commitment to participate in any further development of the emergency response plans, including any required training and field demonstrations, and to work with UNES and PPL to identify any needed changes to the attached current Letters of Agreement with the SSES site. We request your response by August 15, 2008.

If you have any questions regarding this request, please feel free to contact me at (410) 470-5531.

Thank you.

Sincerely,

John Price
UniStar Nuclear Energy
COL Application Coordinator

Attachment: Current Letters of Agreement

SAMPLE LETTER FOR THE POND HILL-LILY LAKE AMBULANCE ASSOCIATION

Dear Mr. Price:

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Pond Hill-Lily Lake Ambulance Association is committed to participating in any further development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities to transport patients from the station who may have injuries complicated with radioactive contamination or who may have been involved in a radiation incident under the existing Letter of Agreement attached.

Sincerely,

Mark Stettler

SP 3-354P (10-97)

PENNSYLVANIA STATE POLICE
TROOP P - AREA II
475 WYOMING AVENUE
WYOMING, PA 18644-1898

PHONE: (570) 697-2000
(570) 697-2004
FAX: (570) 697-2010

August 4, 2008

John Price
UniStar Nuclear Energy
COL Application Coordinator
100 Constellation Way, Suite 1400P
Baltimore, Maryland 21202

Dear Mr. Price,

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Pennsylvania State Police is committed to participating in any futher development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities for providing law enforcement services – including traffic control and notification and/or movement of people – under the existing Letter of Agreement.

Sincerely,

Captain Donald C. Peters
Commanding Officer
Troop P, Wyoming

clb

Reliance Fire Company, No. 1
"Berwick's Oldest Fire Company"
Chartered August 11, 1900
501 West Third Street
Berwick, Pennsylvania 18603
PHONE (570) 752-5621
fax (570) 752-5199

July 30, 2008

Re: SSES Potential Unit 3

Dear Mr. Price,

For the UniStar Nuclear Energy Services LLC (UNES and PPL Nuclear Development, LLC (PPL) proposed US Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, Luzerne County, Pennsylvania, the Reliance Fire Company, No. 1, is committed to participating in any further further developments of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities for providing fire fighting/suppression assistance, including personnel and equipment, under the existing Letter of Agreement attached.

Sincerely,

William R Coolbaugh

William R Coolbaugh
Berwick Fire Chief

August 2, 2008

SALEM TWP. VOL. FIRE CO. #1
1316 Salem Blvd.
P.O. box 75, Beach Haven PA. 18601
Phone/fax: (570) 759-0020

Dear Mr. Price:

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Salem Township Fire Company #1 is committed to participating in any further development of the emergency response plans, including and required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities for providing fire fighting assistance, including personnel and equipment , under the existing Letter of Agreement attached.

Sincerely,

Stephen L Bodnar

Stephen L. Bodnar
Acting Fire Chief

SHICKSHINNY AREA VOLUNTEER AMBULANCE ASSOC., INC.
7 MAIN STREET
MOCANAQUA, PA 18655
PHONE: (570)542-7707
FAX: (570)542-7858

July 30, 2008

Dear Mr. Price:

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U. S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Shickshinny Area Volunteer Ambulance Association, Inc. is committed to participating in any further development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities to transport patients from the station who may have injuries complicated with radioactive contamination or who may have been involved in a radiation incident under the existing Letter of Agreement attached.

Sincerely

Stephen McDaniels, President

Shickshinny
Fire - Rescue

Shickshinny Volunteer Fire Co.
36 West Union Street
Shickshinny PA 18655

Phone: 570-542-5281
Fax: 570-572-5992
Email: firechief175@hotmail.com

August 1, 2008

UniStar Nuclear Energy
100 Constellation Way
Suite 1400P
Baltimore, MD 21202

Dear Mr. Price

For the UniStar Nuclear Services LLC (UNES) and PPL Nuclear Development LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, PA, the Shickshinny Volunteer Fire Company is committed to participating in any further development of the emergency response plans, including any required training and field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities for providing fire fighting assistance, including personnel and equipment, under the existing Letter of Agreement attached.

Sincerely,

Kevin T. Morris
Fire Chief

The Professional Volunteers!

Appendix 4: Glossary of Terms and Acronyms

Accident	An unforeseen and unintentional event which may result in an emergency.
Accident Assessment	Accident assessment consists of a variety of actions taken to determine the nature, effects and severity of an accident and includes evaluation of reactor operator status reports, damage assessment reports, meteorological observations, seismic observations, fire reports, radiological dose projections, in plant radiological monitoring, and environmental monitoring.
Activation	(1) {"ERO Activation" is the process of initiating actions to notify and mobilize Emergency Response Organization (ERO) personnel following an event classification under the emergency plan.} (2) {"Facility Activation" refers to the decision to consider a facility fully operational based on the minimum staffing required under Table B-1 of the emergency plan and the ability of facility staffing and equipment to perform its designed function(s)}.
Affecting Safe Shutdown	Event in progress has adversely affected functions that are necessary to bring the plant to and maintain it in the applicable HOT or COLD SHUTDOWN condition. Plant condition applicability is determined by Technical Specification LCOs in effect. Example 1: Event causes damage that results in entry into an LCO that requires the plant to be placed in HOT SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event **is not** “AFFECTING SAFE SHUTDOWN.” Example 2: Event causes damage that results in entry into an LCO that requires the plant to be placed in COLD SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event **is** “AFFECTING SAFE SHUTDOWN.

Appendix 4: Glossary of Terms and Acronyms

Alert	Events are in process 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 EPA Protective Action Guideline exposure levels.
Annual	{Frequency of occurrence equal to once per calendar year, January 1 to December 31}.
Assembly/Accountability	A procedural or discretionary protective action taken for all persons within the security "Protected Area", which involves the gathering of personnel into pre-designated areas, and the subsequent verification that the location of these personnel is known.
Assessment Actions	Those actions taken during or after an emergency to obtain and process information that is necessary to make decisions to implement specific emergency measures.
Biennial	Frequency of occurrence equal to once per two calendar year periods.
Biennial Exercise	An event that tests the integrated capability and a major portion of the basic elements existing within an emergency plan. An exercise usually involves participation of personnel from {Commonwealth} and local governments, licensee personnel, and may involve participation of Federal government personnel. These exercise are evaluated by the NRC and DHS-FEMA.
Biweekly	Occurring on alternate weeks, with the 7-day week.
Classification	The classification of emergencies is divided into Five (5) categories or conditions, covering the postulated spectrum of emergency situations. The first four (4) emergency classifications are characterized by Emergency Action Levels (EALs) or event initiating conditions and address emergencies of increasing severity. The fifth, the Recovery classification, is unique in that it may be viewed as a phase of the emergency, requiring specific criteria to be met and/or considered prior to its declaration.

Appendix 4: Glossary of Terms and Acronyms

{Columbia County Department of Public Safety (CCDPS)	Emergency response coordinating agency for Columbia County, responsible for implementing off-site action upon direct notification from Susquehanna SES or PEMA.}
Command and Control	When in Command and Control, the designated Emergency Response Facility (ERF) has overall responsibility for the Licensee's emergency response efforts, including the non-delegable responsibilities of Command and Control.
Committed Dose Equivalent (CDE)	The Dose Equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.
{Corporate Leadership Council (CLC)	PPL Bell Bend LLC Management group which determines major policy commitments for the company. The CLC membership includes the President of the company and other senior executives}.
Corrective Action	Those emergency measures taken to lessen or terminate an emergency situation at or near the source of the problem, to prevent an uncontrolled release of radioactive material, or to reduce the magnitude of a release. Corrective actions include, equipment repair or shutdown, installation of emergency structures, fire fighting, repair, and damage control.
Damage Assessment	Estimates and descriptions of the nature and extent of damages resulting from an emergency or disaster; of actions that can be taken to prevent or mitigate further damage; and of assistance required in response and recovery efforts based on actual observations by qualified engineers and inspectors.
Decontamination	The reduction or removal of contaminated radioactive material from a structure, area, material, object, or person. Decontamination may be accomplished by (1) treating the surface so as to remove or decrease the contamination; (2) letting the material stand so that the radioactivity is decreased as a result of natural decay; and (3) covering the contamination.

Appendix 4: Glossary of Terms and Acronyms

{Department of Environmental Protection/Bureau of Radiation Protection (DEP/BRP)}	State agency responsible to provide guidance and recommendations for specific off-site protective measures.
Department of Homeland Security – Federal Emergency Management Agency (DHS-FEMA)	Within the context of this plan, serves as the primary contact for requests for Federal assistance; lead coordinator all non-technical federal response.
Dedicated Communications	A communications link between two or more locations, access to which is limited to designated locations, and used only for the purpose intended. The communications link may be either telephone or radio.
Deep Dose Equivalent (DDE)	The dose equivalent at a tissue depth of 1 cm (1000 mg/cm^2); applies to external whole body exposure.
Dose	A generic term that means absorbed dose, dose equivalent, effective dose equivalent, deep dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent.
Dose Equivalent (DE)	The product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The unit of dose equivalent is the Rem (Sv).
Dose Projection	The calculated estimate of a radiation dose to individuals at a given location (normally off-site), determined from the source term/quantity of radioactive material (Q) released, and the appropriate meteorological dispersion parameters (X/Q).
Dose Rate	The amount of ionizing (or nuclear) radiation to which an individual would be exposed per unit of time. As it would apply to dose rate to a person, it is usually expressed as rems per hour or in submultiples of this unit, such as millirems per hour. The dose rate is commonly used to indicate the level of radioactivity in a contaminated area.
Dosimeter	An instrument such as a thermoluminescent dosimeter (TLD), self-reading pocket dosimeter (SRPD), or electronic dosimeter (ED) for measuring, registering, or evaluating total accumulated dose or exposure to ionizing radiation.

Appendix 4: Glossary of Terms and Acronyms

Drill	A supervised instruction period aimed at testing, developing and maintaining skills in a particular operation.
Early Phase	The period at the beginning of a nuclear incident when immediate decisions for effective use of protective actions are required and must be based primarily on predictions of radiological conditions in the environment. This phase may last from hours to days. For the purposes of dose projections it is assumed to last four days.
Effective Dose Equivalent (EDE)	The sum of the products of the dose equivalent to the organ or tissue and the weighting factors applicable to each of the body organs or tissues that are irradiated.
Emergency Actions	Steps taken, as a result of exceeding an Emergency Action Level in the Emergency Plan, to ensure that the situation is assessed and that the proper corrective and/or protective actions are taken.
Emergency Action Levels (EALs)	A pre-determined, site-specific, observable threshold for a plant Initiating Condition that places the plant in a given emergency class. An EAL can be an instrument reading; an equipment status indicator; a measurable parameter (onsite or offsite); a discrete, observable event; or another phenomenon which, if it occurs, indicates entry into a particular emergency class.
Emergency Alert System (EAS)	A network of broadcast stations and interconnecting facilities which have been authorized by the Federal Communications Commission to operate in a controlled manner during a war, state of public peril or disaster, or other national or local emergency. In the event of a nuclear reactor accident, instructions/notifications to the public on conditions or protective actions would be broadcast by {commonwealth} or local government authorities on the EAS.
{Emergency Director}	The Director of the facility in Command and Control. One of the following: the {Interim Emergency Director} (Control Room), {Emergency Plant Manager} (TSC) or the {Emergency Director} (EOF).
Emergency Notification System (ENS)	The NRC Emergency Notification System hot line is a dedicated telephone system that connects the plant with NRC headquarters in White Flint, Maryland. It is directly used for reporting emergency conditions to NRC personnel.

Appendix 4: Glossary of Terms and Acronyms

Emergency Operating Procedures (EOPs)	EOPs are step-by-step procedures for direct actions taken by licensed reactor operators to mitigate and/or correct an off normal plant condition through the control of plant systems.
Emergency Operations Center (EOC)	A facility designed and equipped for effective coordination and control of emergency operations carried out within an organization's jurisdiction. The site from which civil government officials (municipal, local, {Commonwealth}, and Federal) exercise direction and control in a civil defense emergency.
Emergency Operations Facility (EOF)	An emergency response facility designed and equipped for effective communication, coordination and control of emergency operations carried out by the Site and communicated to the offsite emergency response organizations.
Emergency Personnel	Those organizational groups that perform a functional role during an emergency condition. Within the Licensee, emergency personnel include the Managers and Directors of the Emergency Response Organization, accident assessment personnel, radiological monitoring teams, fire brigades, first aid teams and security personnel.
Emergency Plan Implementing Procedures (EPIP)	Specific procedures defining in detail the action to be taken in the event of an emergency condition. The Emergency Plan Implementing Procedures will be separate from, but may incorporate and refer to, normal plant operating procedures and instructions, Emergency Plan Position Specific Procedures and Emergency Plan Technical Procedures.
Emergency Planning Zones (EPZ)	That area surrounding a nuclear station in which emergency planning is conducted for the protection of the public. With respect to protecting the public from the plume exposure resulting from an incident, the EPZ is usually an area with a radius of about 10 miles (16 kilometers) surrounding the facility. With respect to the ingestion exposure pathway, the EPZ is usually an area with a radius of about 50 miles (80 kilometers).
Emergency Preparedness	A state of readiness that provides reasonable assurance that adequate protective measures can and will be taken upon implementation of the emergency plan in the event of a radiological emergency.

Appendix 4: Glossary of Terms and Acronyms

Emergency Response Data System (ERDS)	ERDS is a direct near real-time electronic data link between the licensee's onsite computer system and the NRC Operations Center that provides for the automated transmission of a limited data set of selected parameters.
Environmental Monitoring	The use of radiological instruments or sample collecting devices to measure and assess background radiation levels and/or the extent and magnitude of radiological contamination in the environment around the plant. This may be done in various stages such as pre-operational, operational, emergency, and post operational.
Essential Personnel	Essential personnel are those needed to achieve the goals and tasks as deemed necessary by the {Emergency Plant Manager}.
Evacuation	The urgent removal of people from an area to avoid or reduce high level, short-term exposure usually from the plume or from deposited activity.
Exclusion Area	An Exclusion Area is an area specified for the purpose of reactor site evaluation in accordance with 10 CFR 100. It is an area of such size that an individual located at any point on its boundary for two hours immediately following onset of the postulated release would not receive a total radiation dose to the whole body in excess of 25 rem (0.25 Sv) or a total radiation dose of 300 rem (3 Sv) to the thyroid from iodine exposure.
Exercise	An event that tests the integrated capability of a major portion of the basic elements existing within emergency preparedness plans and organizations.
Exercise Cycle	A six-year period of time.
Fission Product Barrier	The fuel cladding, reactor coolant system boundary, or the containment boundary.
General Emergency	Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Appendix 4: Glossary of Terms and Acronyms

Hazardous Material	A substance or material which has been determined by the United States Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated in 49 CFR 172.
Health Physics Network (HPN) Line	In the event of a Site Area Emergency, the NRC HPN line will be activated by the NRC Operations center in White Flint, Maryland. This phone is part of a network that includes the NRC Regional Office and the NRC Operations Headquarters in White Flint, Maryland. This system is dedicated to the transmittal of radiological information by plant personnel to NRC Operations Center and the Regional office. HPN phones are located in the TSC and EOF.
Hostile Action	An act toward a Nuclear Power Plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the plant to achieve an end. This includes attack by air, land, or water using weapons, 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 power plant. Non-terrorism based EALs should be used to address such activities, (e.g. violent acts between individuals in the owner controlled area).
Immediately Dangerous to Life and Health (IDLH)	A condition that either poses an immediate threat to life and health or an immediate threat of severe exposure to contaminants which are likely to have adverse delayed effects on health.
Imminent	Mitigation actions have been ineffective and trended information indicates that the event or condition will occur {within 2 hours}.
Ingestion Exposure Pathway	The potential pathway of radioactive materials to the public through consumption of radiologically contaminated water and foods such as milk or fresh vegetables. Around a nuclear power plant this is usually described in connection with the 50-mile (80-kilometer) radius Emergency Planning Zone (50 mile (80-kilometer) EPZ).

Appendix 4: Glossary of Terms and Acronyms

Initiating Condition	A predetermined Unit condition where either the potential exists for a radiological emergency or such an emergency has occurred.
Intermediate Phase	The period beginning after the source and releases have been brought under control and reliable environmental measurements are available for use as a basis for decisions on additional protective actions.
Independent Spent Fuel Storage Facility (ISFSI)	– A series of adjacent concrete structures located within the SSES Protected Area that contain spent fuel storage canisters.
Joint Information Center (JIC)	An Emergency Response Facility activated by the Licensee and staffed by Licensee, {Commonwealth}, and Federal Public Information personnel. This facility serves as the single point of contact for the media and public to obtain information about an emergency.
Late Phase	The period beginning when recovery action designed to reduce radiation levels in the environment to acceptable levels for unrestricted use are commenced and ending when all recovery actions have been completed. This period may extend from months to years (also referred to as the recovery phase).
Lens Dose Equivalent (LDE)	The external exposure to the lens of the eye.
Lower Flammability Limit (LFL)	The minimum concentration of a combustible substance that is capable of propagating a flame through a homogenous mixture of the combustible and a gaseous oxidizer.
{Luzerne County Emerg ency Management Agency (LCEMA)	The host county emergency response coordinating agency, responsible for implementing off-site action upon either direct notification from the Susquehanna SES or from PEMA.}
Local Evacuation	The evacuation of personnel from a particular area, such as a room or building.
Main Control Room	The operations center of a nuclear power plant from which the plant can be monitored and controlled.
Monthly	Frequency of occurrence equal to once per calendar month.

Appendix 4: Glossary of Terms and Acronyms

Non-Essential Site Personnel	Those personnel not needed for the continuing existence or functioning of the ERO. They are personnel not required to fill certain positions in the ERO. Identification of non-essential personnel is circumstance-oriented as determined by the {Emergency Plant Manager}.
Notification, Public	Public notification means to communicate instructions on the nature of an incident that prompted the public alerting/warning and on protective or precautionary actions that should be taken by the recipients of the alert. A {commonwealth} and local government process for providing information promptly to the public over radio and TV at the time of activating the alerting (warning) signal (sirens). Initial notifications of the public might include instructions to stay inside, close windows, and doors, and listen to radio and TV for further instructions. Commercial broadcast messages are the primary means for advising the general public of the conditions of any nuclear accident. (See Emergency Alert System.)
Notification of Unusual Event (Unusual Event)	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 offsite response or monitoring are expected unless further degradation of safety systems occurs.
Off-Site	The area around a nuclear generating station that lies outside the station's "site boundary".
Offsite Dose Calculation Manual (ODCM)	The ODCM presents a discussion of the following: 1. The ways in which nuclear power plants can affect their environment radiologically 2. The regulations which limit radiological effluents from the nuclear power plants; and 3. The methodology used by the nuclear power plants to assess radiological impact on the environment and compliance with regulations.
On-Site	The area around a nuclear generating plant that lies within the plant's "site boundary".

Appendix 4: Glossary of Terms and Acronyms

Owner Controlled Area	Company owned property on which a Nuclear Station is located and may include Licensee leased lands adjacent to that Nuclear Station.
Operations Support Center (OSC)	An emergency response facility at the Plant to which support personnel report and stand by for deployment in an emergency situation.
Owner Controlled Area	Includes the area within the expanded security perimeter, i.e. the areas that are bordered by the Vehicle Barrier System. The OWNER CONTROLLED AREA encompasses the Security Owner Controlled Area (SOCA) and Monitored Owner Controlled Area (MOCA) as defined in Security Procedures.
{Pennsylvania Emergency Management Agency (PEMA) }	Within the context of this plan, the lead state-agency for radiological emergency planning, response and recovery and for providing guidance to local government for development of radiological emergency plans and programs.
Personnel Monitoring	The determination of the degree of radioactive contamination on individuals, using standard survey meters, and/or the determination of dosage received by means of dosimetry devices.
Puff Release	A controlled containment vent that will be terminated prior to exceeding 60 minutes in duration **AND** exceeds either the EPA-400 TEDE or CDE Thyroid PAG.
Plume Exposure Pathway	The potential pathway of radioactive materials to the public through: (a) whole body external exposure from the plume and from deposited materials, and (b) inhalation of radioactive materials.
Population-at-Risk	Those persons for whom protective actions are being or would be taken. In the 10-mile (16-kilometer) EPZ the population-at-risk consists of resident population, transient population, special facility population, and industrial population.
Potassium Iodide	(Symbol KI) A chemical compound that readily enters the thyroid gland when ingested. If taken in a sufficient quantity prior to exposure to radioactive iodine, it can prevent the thyroid from absorbing any of the potentially harmful radioactive iodine-131.

Appendix 4: Glossary of Terms and Acronyms

{PPL Bell Bend, LLC	Subsidiary company of PPL Corporation that owns and operates Bell Bend Nuclear Power Plant.}
Potential	Mitigation actions are not effective and trended information indicates that the parameters are outside desirable bands and not stable or improving.
Projected Dose	That calculated dose that some individuals in the population group may receive if no protective actions are implemented. Projected doses are calculated to establish an upper limit boundary.
Protected Area	That onsite area within the security boundary as defined in each site's Security Plan.
Protection Factor (PF)	The relation between the amount of radiation that would be received by a completely unprotected person compared to the amount that would be received by a protected person such as a person in a shielded area. PF = Unshielded dose rate X shielded dose rate.
Protective Action	Those emergency measures taken for the purpose of preventing or minimizing radiological exposures to affected population groups.
Protective Action Guide (PAG)	Projected radiological dose values to individuals in the general population that warrant protective action. Protective Action Guides are criteria used to determine if the general population needs protective action regarding projected radiological doses, or from actual committed (measured) dose values.
Protective Action Recommendations (PARs)	Recommended actions to the States for the protection of the offsite public from whole body external gamma radiation, and inhalation and ingestion of radioactive materials. The PAR issued may be to evacuate or shelter-in-place. Access control and other recommendations concerning the safeguards of affected food chain processes may be issued by the States as PARs.
Public Alerting/Warning	The process of signaling the public, as with sirens, to turn on their TV's or radios and listen for information or instructions broadcast by {commonwealth} or local government authorities on the Emergency Alert System (EAS).

Appendix 4: Glossary of Terms and Acronyms

Quarterly	Frequency of occurrence equal to once in each of the following four periods: January 1 through March 31; April 1 through June 30; July 1 through September 30; October 1 through December 31.
Recovery	The process of reducing radiation exposure rates and concentrations of radioactive material in the environment to levels acceptable for unconditional occupancy or use.
Release	{A 'Release in Progress' is defined as ANY radioactive release that is a result of, or associated with, the emergency event.}
Restricted Area	Any area, access to which is controlled by {BBNPP} for purposes of protection of individuals from exposure to radiation and radioactive materials.
Safety Analysis Report, Final (FSAR)	The FSAR is a comprehensive report that the licensee is required to submit to the NRC as a prerequisite and as part of the application for an operating license for a nuclear power plant. The multi-volume report contains detailed information on the plant's design and operation, with emphasis on safety-related matters.
Semi-Annual	Frequency of occurrence equal to once in each of the following periods: January 1 through June 30; July 1 through December 31.
Shielding	Any material or barrier that attenuates (stops or reduces the intensity of) radiation.
Site Area Emergency	Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels that exceed EPA Protective Action Guideline exposure levels beyond the site boundary.
Site Boundary	The Nuclear Plant's Site Boundary is described in detail in the ODCM.

Appendix 4: Glossary of Terms and Acronyms

Site Evacuation	The evacuation of non-essential personnel from the plant site.
Source Term	Radioisotope inventory of the reactor core, or amount of radioisotope released to the environment, often as a function of time.
Technical Support Center (TSC)	An emergency response facility outside of the Control Room in which information is supplied on the status of the plant to those individuals who are knowledgeable or responsible for engineering and management support of reactor operations in the event of an emergency, and to those persons who are responsible for management of the on-site emergency response.
Total Effective Dose Equivalent (TEDE)	Integrated doses consisting of the sum of external doses from plume shine, 50 year committed effective dose equivalent from inhalation (CEDE), and 4 day ground shine doses.
Threshold Value	Measurable, observable detailed conditions which must be satisfied to determine an EAL applicability.
Thyroid Blocking Agent	An agent which when properly administered to an individual will result in sufficient accumulation of stable iodine in the thyroid to prevent significant uptake of radioiodine. Potassium Iodide is such an agent.
Thyroid Dose	Radiation exposure to the thyroid through inhalation or ingestion of radioactive materials.
Total Effective Dose Equivalent (TEDE)	The sum of the deep dose equivalent (for external exposure) and the committed effective dose equivalent (for internal exposure) and – for offsite dose projections - 4 days of deposition exposure.
Unrestricted Area	Any area to which access is not controlled by the licensee for protecting individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.

Appendix 4: Glossary of Terms and Acronyms

Safety Analysis Report, Updated (UFSAR)	The UFSAR is a comprehensive report that the licensee is required to submit to the NRC as part of the application for an operating license for a nuclear power plant. The multi-volume report contains detailed information on the plant's design and operation, with emphasis on safety-related matters. The UFSAR contains updated information to the FSAR.
Vital Areas	{Areas within the site security fence which contain vital equipment.}
Vital Equipment	{Any equipment, system, device or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation. Equipment or systems which would be required to function to protect public health and safety following such failure, destruction, or release are also considered to be vital.}
Weekly	Frequency occurrence equal to once per calendar week: Sunday through Saturday.
Whole Body Exposure	Direct radiation exposure to the body from external sources.

Appendix 4: Glossary of Terms and Acronyms

Acronyms

Note: Any abbreviation followed by a lower case 's' denotes the plural form of the term.

ac .... alternating current

ALARA .... as low as reasonably achievable

ANI .... American Nuclear Insurers

ANS .... Alert Notification System

ANSI .... American National Standards Institute

ARM .... Area Radiation Monitor

ASLB .... Atomic Safety Licensing Board

BWR .... Boiling Water Reactor

CB .... citizen band

cc .... cubic centimeter

CEOC .... County Emergency Operation Center

CFR .... Code of Federal Regulations

CHRMS .... Containment High Range Monitoring System

cm^2 .... square centimeter

CR .... Control Room

Cs .... Cesium

dc .... direct current

DEQ .... Department of Environmental Quality

DHFS .... Department of Health and Family Services

DHS .... Department of Homeland Security

DOE .... U. S. Department of Energy

DOT .... U. S. Department of Transportation

DPH .... Department of Public Health

DHS .... Department of Homeland Security

dpm .... disintegration per minute

EAL .... Emergency Action Level

Appendix 4: Glossary of Terms and Acronyms

Acronyms

EAS .... Emergency Alerting System

EMA .... Emergency Management Agency

ENS .... Emergency Notification System (NRC)

EOC .... Emergency Operations (or Operating) Center

EOF .... Emergency Operations Facility

EOP .... Emergency Operating Procedure

EPA .... U. S. Environmental Protection Agency

EPDS .... Emergency Preparedness Data System

EPZ .... Emergency Planning Zone

ERF .... Emergency Response Facility

ESF .... Engineered Safety Feature

FEMA .... Federal Emergency Management Agency

FRERP .... Federal Radiological Emergency Response Plan

FRMAP .... Federal Radiological Monitoring and Assessment Plan

FRPCC .... Federal Radiological Preparedness Coordinating Committee

FSAR .... Final Safety Analysis Report

Ge .... Germanium

GET .... General Employee Training

HEPA .... high efficiency particulate air

HPN .... Health Physics Network (NRC)

hr .... hour

I .... Iodine

IRAP .... Interagency Radiological Assistance Plan

Appendix 4: Glossary of Terms and Acronyms

Acronyms

INPO .... Institute of Nuclear Power Operations

JIC .... Joint Information Center

LGEOC .... Local Government Emergency Operations Center

Li .... Lithium

LOCA .... Loss of Coolant Accident

MAELU .... Mutual Atomic Energy Liability Underwriters

MCP .... Municipal Command Post

mR .... milliroentgen

NCRP .... National Council on Radiation Protection

NOP .... Nuclear Organization Procedure

NRC .... U. S. Nuclear Regulatory Commission

NRP .... National Response Plan

OSC .... Operations Support Center

PAG .... Protective Action Guide

{PNS .... Public Notification System}

PAR .... Protective Action Recommendation

{PEMA .... Pennsylvania Emergency Management Agency}

PASS .... Post Accident Sampling System

{PPL .... Pennsylvania Power and Light}

PWR .... Pressurized Water Reactor

QAPD .... Quality Assurance Program Description

R .... Roentgen

RAC .... Regional Advisory Committee (FEMA)

RAP .... Radiological Assistance Plan

Appendix 4: Glossary of Terms and Acronyms

Acronyms

REAC ....Radiological Emergency Assessment Center

REP...Radiological Emergency Plan

Rx...Reactor

SAMG...Severe Accident Management Guidelines

SCBA .... self contained breathing apparatus

SEOC ....State Emergency Operations Center

SFCP... State Forward Command Post

SHL ....State Hygienic Laboratory

SPCC .... Spill Prevention Control and Countermeasure

SPDS ....Safety Parameter Display System

Sr..Strontium

Sv..Sievert

STA ....Shift Technical Advisor

TDD...Telecommunications Device for the Deaf

TLD ....Thermoluminescent Dosimeter

TSC ....Technical Support Center

μCi...microcurie

UFSAR ....Updated Final Safety Analysis Report

Appendix 5: Evacuation Time Estimates

{The results of the “Susquehanna Steam Electric Station (SSES)/Bell Bend Development of Evacuation Time Estimates”, Revision 2, dated November, 2008 is provided separately in Part 5 of the COL Application.}

{BELL BEND NUCLEAR POWER PLANT}
EMERGENCY PLAN
ANNEX

{PPL Bell Bend, LLC}

Revision 0

Approved by ____ Date ___________
Senior Vice President, PPL Bell Bend, LLC

Table of Contents

Section 1: Introduction

This {Bell Bend Nuclear Power Station (BBNPP)} Emergency Plan Annex provides unit specific details for {BBNPP}.

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

1.1 Unit Description

{BBNPP} is an AREVA U.S. Evolutionary Power Reactor (EPR) is an evolutionary Pressurized Water Reactor (PWR) designed by Framatome ANP, Inc., a jointly-owned subsidiary of AREVA and Siemens. It is a four-loop plant with a rated thermal power of 4,590 MWt. The primary system design, loop configuration, and main components are similar to those of currently operating PWRs.

The U.S. EPR safety design features include four redundant trains of emergency core cooling, containment and Shield Building, and a core melt retention system for severe accident mitigation, which meet applicable regulatory and commercial requirements.

The safety design of the U.S. EPR is based primarily on deterministic analyses complemented by probabilistic analyses. The deterministic approach is based on the "defense-in-depth" concept which comprises four levels:

1. A combination of conservative design, quality assurance, and surveillance activities to prevent departures from normal operation
2. Detection of deviations from normal operation and protection devices and control systems to cope with them (This level of protection is provided to ensure the integrity of the fuel cladding and of the Reactor Coolant Pressure Boundary (RCPB) in order to prevent accidents.)
3. Engineered safety features and protective systems that are provided to mitigate accidents and consequently to prevent their evolution into severe accidents
4. Measures to preserve the integrity of the containment and enable control / mitigation of severe accidents

Low probability events with multiple failures and coincident occurrences up to the total loss of safety-grade systems are considered in addition to the deterministic design basis. Representative scenarios are defined for preventing both core melt and large releases in order to develop parameters for risk reduction features. A probabilistic approach is used to define these events and assess the specific measures available for their management. Consistent with international and U.S. probabilistic safety objectives, the frequency of core melt is less than 10-5/reactor-year including all events and all reactor states.

Design provisions for the reduction of the residual risk, core melt mitigation, and the prevention of large releases are:

- Prevention of high pressure core melt by high reliability of decay heat removal systems, complemented by primary system Overpressure Protection (OPP)

- Primary system discharge into the containment in the event of a total loss of secondary side cooling

- Features for corium spreading and cooling

- Prevention of hydrogen detonation by reducing the hydrogen concentration in the containment at an early stage with catalytic hydrogen recombiners

- Control of the containment pressure increase by a dedicated Severe Accident Heat Removal System (SAHRS) consisting of a spray system with recirculation through the cooling structure of the melt retention device

External events such as an aircraft hazard, Explosion Pressure Wave (EPW), seismic events, missiles, tornado, and fire have been considered in the design of Safeguard Buildings and the hardening of the Shield Building.

A. Overview of the U.S. EPR Design

The U.S. EPR is furnished with a four-loop, pressurized water, Reactor Coolant System (RCS) composed of a reactor vessel that contains the fuel assemblies, a pressurizer including control systems to maintain system pressure, one Reactor Coolant Pump (RCP) per loop, one SG per loop, associated piping, and related control and protection systems.

The RCS is contained within a concrete containment building. The containment building is enclosed by a Shield Building with an annular space between the two buildings. The post-tensioned concrete shell of the Containment Building is furnished with a steel liner and the Shield Building wall is reinforced concrete. The Containment and Shield Buildings comprise the Reactor Building. The Reactor Building is surrounded by four Safeguard Buildings and a Fuel Building. The internal structures and components within the Reactor Building, Fuel Building, and two Safeguard Buildings (including the plant Control Room) are protected against aircraft hazard and external explosions. The other two Safeguard Buildings are not protected against aircraft hazard or external explosions. However, they are separated by the Reactor Building, which restricts damage from these external events to a single safeguards building.

Redundant capacity safety systems for certain major safety systems are separated into four divisions. With four divisions, one division can be out-of-service for maintenance and one division can fail to operate, while the remaining two divisions are available to perform the necessary safety functions, even if one is ineffective due to the initiating event.

In the event of a loss of off-site power, each safeguard division is powered by a separate Emergency Diesel Generator (EDG). In addition to the four safety-related diesels that power various safeguards, two independent diesel generators are available to power essential equipment during a postulated Station Blackout (SBO) event—loss of off-site AC power with coincident failure of all four EDGs.

Water storage for safety injection is provided by the In-containment Refueling Water Storage Tank (IRWST). Also inside containment, below the Reactor Pressure Vessel (RPV), is a dedicated spreading area for molten core material following a postulated worst-case severe accident.

The fuel pool is located outside the Reactor Building in a dedicated building to simplify access for fuel handling during plant operation and handling of fuel casks. The Fuel Building is protected against aircraft hazard and external explosions. Fuel pool cooling is assured by two redundant, safety-related cooling trains.

Section 2: Organizational Control of Emergencies

Section B of the {BBNPP} Emergency Plan describes the station's Emergency Response Organization (ERO). When the ERO is fully activated it will be staffed as described in the plan. This section of the Unit Annex describes the Shift ERO staffing and their responsibilities to implement the emergency plan.

2.1 Normal Station Management Overview

A. Corporate Organization and Functions

The {PPL Bell Bend, LLC} is the owner and operator of {BBNPP}. {PPL Bell Bend, LLC} is responsible for siting, design and construction of {BBNPP} in accordance with its Quality Assurance Program. A detailed description of the Organizational Structure of {PPL Bell Bend, LLC} can be found in Section 13.1 of the FSAR.

2.2 Normal Shift Staffing

The makeup of the normal shift is controlled by the unit's Technical Specifications and 10 CFR 50.54(m). Section B.1 of the {BBNPP} Emergency Response Plan describes the normal responsibilities of shift personnel.

2.3 Shift Emergency Response Positional Responsibilities

Table B-1a outlines Shift ERO positions required to meet minimum staffing and the major tasks assigned to each position

Table B-1a
Shift Emergency Response Organization

Functional Area	Major Tasks	Emergency Positions	Minimum Shift Size
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	{Shift Supervisor} (CR)	1
		Control Room Supervisor (CR)	1
		Reactor Operator (CR)	2
		Equipment Operator	2
2. Emergency Direction and Control	Command and Control /Emergency Operations	{Shift Supervisor (Interim Emergency Director)} (CR)	1[(a)]
3. Notification & Communication	Emergency Communications	{Shift Communicator} [(e)] (CR)	1
4. Radiological Accident Assessment and Support of Operational Accident Assessment	In-plant Surveys	RP Technicians	1
	Chemistry	Chemistry Personnel	1
5. Plant System Engineering, Repair and Corrective Actions	Technical Support	{Shift Technical Assistant (STA)} [(e)] (CR)	1
	Repair and Corrective Actions	Mechanical Maintenance	1[(b)]
		Electrical / Instrument & Control	1[(b)]
6. In-Plant Protective Actions	Radiation Protection	RP Personnel	2[(b)]
7. Fire Fighting	--	Fire Brigade	(c)
8. First Aid and Rescue Operations	--	Plant Personnel	2[(b)]
9. Site Access Control and Personnel Accountability	Security & Accountability	Security Team Personnel	(d)
		TOTAL:	**10**

(a) The {Shift Supervisor} shall function as the {Interim Emergency Director} prior to TSC activation.

(b) May be provided by personnel assigned other functions. Personnel can fulfill multiple functions.

(c) Per Station Fire Protection Plan

(d) Per Station Security Plan

(e) An Individual shall be designated as {Shift Communicator} and an Individual shall be designated as {STA} for a classified event. Once assigned these individuals shall not be assigned other responsibilities.

Section 3: Classification of Emergencies

Section D of the {BBNPP} Emergency Plan describes the classification of emergencies into four levels of Emergency Class. They are the UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY. These classification levels are entered by meeting the criteria of Emergency Action Levels (EALs) provided in this section of the U.S. EPR Annex.

3.1 Emergency Action Levels (EALs)

An Emergency Action Level scheme based on Revision 5 of NEI 99-01, “Methodology for Development of Emergency Action Levels,” currently under review by the Nuclear Regulatory Commission is used for {BBNPP}. Specific items not applicable to the U.S. EPR design are identified and alternate initiating conditions used as appropriate. Table 3-1, Emergency Action Level Initiating Conditions, provides a list of conditions considered for classification.

Emergency Action Level Threshold Values for each of the Initiating Conditions are provided in an EAL Technical Basis Document with appropriate basis and references.

An emergency is classified by assessing plant conditions and comparing abnormal conditions to Initiating Conditions and Threshold Values for each Emergency Action Level. Individuals responsible for the classification of events will refer to the Initiating Condition and Threshold Values in an Emergency Plan Implementing Procedure (EPIP). This EPIP contains Initiating Conditions, EAL Threshold Values, Mode Applicability Designators, appropriate EAL numbering system, and additional guidance necessary to classify events.

The EALs are set up in Recognition Categories. The first relates to Abnormal Radiological Conditions / Abnormal Radiological Effluent Releases. The second relates to Fission Product Barrier Degradation. The third relates to Hot Condition System Malfunctions. The fourth relates to Hazards and Other Conditions. The fifth related to Cold Shutdown System Malfunctions.

Emergency Action Levels are the measurable, observable detailed conditions that must be met in order to classify the event. Classification is not to be made without referencing, comparing and satisfying the Threshold Values specified in the Emergency Action Levels.

Mode Applicability provides the unit conditions when the Emergency Action Levels represent a threat. The Basis contains explanations and justification for including the Initiating Condition and Emergency Action Level.

A list of definitions is provided as part of this document for terms having specific meaning to the Emergency Action Levels. Site specific definitions are provided for terms with the intent to be used for a particular Initiating Condition/Threshold Value and may not be applicable to other uses of that term at other sites, the Emergency Plan or procedures.

An EAL Technical Basis Document provides references to documents which were used to develop the EAL Threshold Values.

References to the {Emergency Director} means the person in Command and Control as defined in the Emergency Plan. Classification of emergencies is a non-delegable responsibility of the {Emergency Director}.

Classifications are based on evaluation of the U.S. EPR Unit condition. All classifications are to be based upon VALID indications, reports or conditions. Indications, reports or conditions are considered VALID when they are verified by (1) an instrument channel check, or (2) indications on related or redundant indications, or (3) by direct observation by plant personnel, such that doubt related to the indication's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

EALs are for unplanned events. A planned evolution involves preplanning to address the limitations imposed by the condition, the performance of required surveillance testing, and the implementation of specific controls prior to knowingly entering the condition. Planned evolutions to test, manipulate, repair, perform maintenance or modifications to systems and equipment that result in an EAL Threshold Value being met or exceeded are not subject to classification and activation requirements as long as the evolution proceeds as planned. However, these conditions may be subject to the reporting requirements of 10 CFR 50.72 and/or 10 CFR 50.73.

When two or more Emergency Action Levels are determined, declaration will be made on the highest classification level for the unit. {When all station units are affected, the highest classification for the Station will be used for notification purposes and specific units' classification levels will be noted}.

3.2. Emergency Action Levels Categories

The EAL Scheme is broken into the following five major categories and numerous sub-categories as appropriate. Each major initiating condition described in Table 3-1, Emergency Action Level Initiating Conditions may be broken into additional sub conditions based on actual threshold values.

A. Category F – Fission Product Barriers

EALs in this category represent threats to the defense in depth design concept that precludes the release of highly radioactive fission products to the environment. This concept relies on multiple physical barriers any one of which, if maintained intact, precludes the release of significant amounts of radioactive fission products to the environment. The primary fission product barriers are:

1. Reactor Fuel Clad (FC): The zirconium tubes which house the ceramic uranium oxide pellets along with the end plugs which are welded into each end of the fuel rods comprise the Fuel Clad.

2. Reactor Coolant System (RC): The Reactor Vessel shell, vessel head, vessel nozzles and penetrations and all primary systems directly connected to the Reactor Vessel up to the first Containment isolation valve comprise the RCS.

3. Containment (CT): The vapor Containment structure and all isolation valves required to maintain Containment integrity under accident conditions comprise the Containment barrier.

The EALs in this category require evaluation of the Loss and Potential Loss thresholds listed in the fission product barrier matrix of Table 3-1. "Loss" and "Potential Loss" signify the relative damage and threat of damage to the barrier. "Loss" means the barrier no longer assures containment of radioactive materials. "Potential Loss" means integrity of the barrier is threatened and could be lost if conditions continue to degrade.

The number of barriers that are lost or potentially lost and the following criteria determine the appropriate emergency classification level:

<u>Unusual Event:</u> Any loss or any potential loss of Containment

<u>Alert:</u> Any loss or any potential loss of either Fuel Clad or RCS

<u>Site Area Emergency:</u> Loss or potential loss of any two barriers

<u>General Emergency</u>: Loss of any two barriers and loss or potential loss of third barrier

The logic used for emergency classification based on fission product barrier monitoring should reflect the following considerations:

The ability to escalate the emergency classification as an event deteriorates must be maintained. For example, RCS leakage steadily increasing would represent an increasing risk to public health and safety.

Fission product barrier monitoring must be capable of addressing dynamic conditions. If reaching a loss or potential loss threshold is imminent (i.e., within 1 to 2 hours) while an event or multiple events occur, judgment dictates that the imminent situation deserves classification as if the thresholds were actually exceeded.

B. Category R – Radiological Effluent / Abnormal Rad Levels

Many EALs are based on actual or potential degradation of fission product barriers because of the elevated potential for offsite radioactivity release. Degradation of fission product barriers though is not always apparent via non-radiological symptoms. Therefore, direct indication of elevated radiological effluents or area radiation levels are appropriate symptoms for emergency classification.

At lower levels, abnormal radioactivity releases may be indicative of a failure of containment systems or precursors to more significant releases. At higher release rates, offsite radiological conditions may result which require offsite protective actions.

Elevated area radiation levels in plant may also be indicative of the failure of containment systems or preclude access to plant vital equipment necessary to ensure plant safety.

Events of this category pertain to the following subcategories:

1. Radiological Effluents

   Direct indication of effluent radiation monitoring systems provides a rapid assessment mechanism to determine releases in excess of classifiable limits. Projected offsite doses, actual offsite field measurements or measured release rates via sampling indicate doses or dose rates above classifiable limits.

2. Abnormal Radiation Levels

   Sustained general area radiation levels in excess of those indicating loss of control of radioactive materials or those levels which may preclude access to vital plant areas also warrant emergency classification.

C. Category H – Hazards

Hazards are non-plant, system-related events that can directly or indirectly affect plant operation, reactor plant safety or personnel safety.

The events of this category pertain to the following subcategories:

1. Security

   Unauthorized entry attempts into the Protected Area, bomb threats, sabotage attempts, and actual security compromises threatening loss of physical control of the plant.

2. Control Room Evacuation

   Events that are indicative of loss of Control Room habitability. If the Control Room must be evacuated, additional support for monitoring and controlling plant functions is necessary through the emergency response facilities.

3. Natural & Destructive Phenomena

   Natural events include hurricanes, earthquakes or tornados that have potential to cause plant structure or equipment damage of sufficient magnitude to threaten personnel or plant safety. Non-naturally occurring events that can cause damage to plant facilities and include vehicle crashes, missile impacts from turbine failure, etc. are included.

4. Fire or Explosion

   Fires can pose significant hazards to personnel and reactor safety. Appropriate for classification, are fires within the site Protected Area or which may affect operability of vital equipment.

5. Toxic / Flammable Gas

   Non-naturally occurring events that can cause damage to plant facilities and include toxic or flammable gas leaks.

6. Judgment

   The EALs defined in other categories specify the predetermined symptoms or events that are indicative of emergency or potential emergency conditions and thus warrant classification. While these EALs have been developed to address the full spectrum of possible emergency conditions which may warrant classification and subsequent implementation of the Emergency Plan, a provision for classification of emergencies based on operator/management experience and judgment is still necessary. The EALs of this category provide the {Interim Emergency Director}, {Emergency Plant Manager} and/or {Emergency Director} the latitude to classify emergency conditions consistent with the established classification criteria based upon their judgment.

D. Category S – System Malfunction

Numerous system-related equipment failure events that warrant emergency classification have been identified in this category. They may pose actual or potential threats to plant safety.

The events of this category pertain to the following subcategories:

1. Loss of AC Power

   Loss of vital plant AC electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity. This category includes total losses of vital plant power sources.

2. Loss of DC Power

   Loss of vital plant DC electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity.

3. Failure of Protection System

   Events related to failure of the Protection System (PS) to initiate and complete reactor trips. In the plant licensing basis, postulated failures of the PS to complete a reactor trip comprise a specific set of analyzed events referred to as Anticipated Transient Without Scram (ATWS) events. For EAL classification however, ATWS is intended to mean any trip failure event that does not achieve reactor shutdown. If RPS actuation fails to assure reactor shutdown, positive control of reactivity is at risk and could cause a threat to Fuel Clad, RCS and Containment integrity.

4. Plant Monitoring

   Certain events that degrade plant operator ability to effectively assess plant conditions within the plant warrant emergency classification. Losses of annunciators are in this subcategory.

5. Technical Specification Limits

   System malfunctions may lead to loss of capability to remove heat removal the reactor core and RCS.

   Only one EAL falls into this subcategory. It is related to the failure of the plant to be brought to the required plant operating condition required by technical specifications if a limiting condition for operation (LCO) is not met.

6. Communications

   Certain events that degrade plant operator ability to effectively communicate with essential personnel within or external to the plant warrant emergency classification.

7. RCS Leakage

   The Reactor Vessel provides a volume for the coolant that covers the reactor core. The Reactor Vessel and associated pressure piping (reactor coolant system) together provide a barrier to limit the release of radioactive material should the reactor Fuel Clad integrity fail.

   Excessive RCS leakage greater than Technical Specification limits are utilized to indicate potential pipe cracks that may propagate to an extent threatening Fuel Clad, RCS and Containment integrity.

9. Fuel Clad Degradation (Note: Fuel Clad Degradation is number 9, 8 is a RCS leakage in Category C)

   During normal operation, reactor coolant fission product activity is very low. Small concentrations of fission products in the coolant are primarily from the fission of tramp uranium in the Fuel Clad or minor perforations in the clad itself. Any significant increase from these base-line levels (2% - 5% clad failures) is indicative of fuel failures and is covered under the Fission Product Barriers category. However, lesser amounts of clad damage may result in coolant activity exceeding Technical Specification limits. These fission products will be circulated with the reactor coolant and can be detected by coolant sampling.

E. Category C – Cold Shutdown / Refueling System Malfunction

Category C EALs are directly associated with cold shutdown or refueling system safety functions. Given the variability of plant configurations (e.g., systems out-of-service for maintenance, containment open, reduced AC power redundancy, time since shutdown) during these periods, the consequences of any given initiating event can vary greatly. For example, a loss of decay heat removal capability that occurs at the end of an extended outage has less significance than a similar loss occurring during the first week after shutdown. Compounding these events is the likelihood that instrumentation necessary for assessment may also be inoperable. The cold shutdown and refueling system malfunction EALs are based on performance capability to the extent possible with consideration given to RCS integrity, containment closure, and Fuel Clad integrity for the applicable operating modes (5 - Cold Shutdown, 6 - Refueling, D – Defueled).

The events of this category pertain to the following subcategories:

1. Loss of AC Power

   Loss of vital plant AC electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity. This category includes total losses of vital plant power sources.

2. Loss of DC Power

   Loss of vital plant DC electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity.

3. Failure of Protection System

   If PS actuation fails to assure positive control of reactivity it could cause a threat to Fuel Clad, RCS and Containment integrity.

6. Communications

   Certain events that degrade plant operator ability to effectively communicate with essential personnel within or external to the plant warrant emergency classification.

7 and 8. RCS Leakage (Note: Categories 7 and 8 are both RCS Leakage in NEI guidance document.)

   The Reactor Vessel provides a volume for the coolant that covers the reactor core. The Reactor Vessel and associated pressure piping (reactor coolant system) together provide a barrier to limit the release of radioactive material should the reactor Fuel Clad integrity fail.

   Excessive RCS leakage greater than Technical Specification limits are utilized to indicate potential pipe cracks that may propagate to an extent threatening Fuel Clad, RCS and containment integrity. This EAL, for Cold Shutdown and Refueling, will be based on RCS leakage limits that are applicable during the operational modes unless other mode specific limits have been established.

10. Heat Sink

   Loss of the ability to remove decay heat could lead to fuel clad degradation.

3.3 Maintenance of Emergency Action Levels

The details of EAL development are documented in an Emergency Action Level Technical Basis Document. Revision of the Technical Basis Document is controlled the same way as the {BBNPP} Emergency Plan, requiring the same reviews including a review in accordance with 50.54(q).

Table 3-1, Emergency Action Levels

FISSION PRODUCT BARRIER DEGRADATION

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
FG1 1 2 3 4 1. Loss of any two barriers and loss or potential loss of the third barrier.	**FS1** 1 2 3 4 1. Loss or potential loss of any two barriers.	**FA1** 1 2 3 4 1. Any loss or any potential loss of either Fuel Clad or RCS.	**FU1** 1 2 3 4 1. Any loss or any potential loss of Containment.

RADIOLOGICAL EFFLUENT / ABNORMAL RADIATION LEVELS

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Radiological Effluents			
RG1 1 2 3 4 5 6 D Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mRem (10 mSv) TEDE or 5000 mRem (50 mSv) Thyroid CDE for the actual or projected duration of the release using actual meteorology.	**RS1** 1 2 3 4 5 6 D Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 100 mRem (1 mSv) TEDE or 500 mRem (5 mSv) Thyroid CDE for the actual or projected duration of the release.	**RA1** 1 2 3 4 5 6 D Any release of gaseous or liquid radioactivity to the environment greater than 200 times the ODCM limit for 15 minutes or longer.	**RU1** 1 2 3 4 5 6 D Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM limit for 60 minutes or longer.
Abnormal Radiation Levels			
		RA2 1 2 3 4 5 6 D Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the reactor vessel.	**RU2** 1 2 3 4 5 6 D UNPLANNED rise in plant radiation levels.
		RA3 1 2 3 4 5 6 D Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions.	

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Security			
HG1 1 2 3 4 5 6 D HOSTILE ACTION resulting in loss of physical control of the facility.	**HS1** 1 2 3 4 5 6 D HOSTILE ACTION within the PROTECTED AREA.	**HA1** 1 2 3 4 5 6 D HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat.	**HU1** 1 2 3 4 5 6 D Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant.
Control Room Evacuation			
	HS2 1 2 3 4 5 6 D Control Room evacuation has been initiated and plant control cannot be established.	**HA2** 1 2 3 4 5 6 D Control Room evacuation has been initiated.	
Natural or Destructive Phenomena			
		HA3 1 2 3 4 5 6 D Natural or destructive phenomena affecting VITAL AREAS.	**HU3** 1 2 3 4 5 6 D Natural or destructive phenomena affecting the PROTECTED AREA.
Fire / Explosion			
		HA4 1 2 3 4 5 6 D FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown.	**HU4** 1 2 3 4 5 6 D FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA.
Toxic / Flammable Gas			
		HA5 1 2 3 4 5 6 D Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize the ability to safely operate or shutdown the reactor.	**HU5** 1 2 3 4 5 6 D Release of toxic, corrosive, asphyxiant or flammable gases deemed detrimental to NORMAL PLANT OPERATIONS.
Judgment			
HG6 1 2 3 4 5 6 D Other conditions exist which in the judgment of the {Emergency Director} warrant declaration of General Emergency.	**HS6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the {Emergency Director} warrant declaration of Site Area Emergency.	**HA6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the {Emergency Director} warrant declaration of an Alert.	**HU6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the {Emergency Director} warrant declaration of an Unusual Event.

SYSTEM MALFUNCTIONS - HOT

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Loss of AC Power			
SG1 1 2 3 4 Prolonged loss of all offsite and all onsite AC power to emergency busses.	**SS1** 1 2 3 4 Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer.	**SA1** 1 2 3 4 AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses.	**SU1** 1 2 3 4 Loss of all offsite AC power to emergency busses for 15 minutes or longer.
Loss of DC Power			
	SS2 1 2 3 4 Loss of vital DC power for 15 minutes or longer.		
Failure of Protection System			
SG3 1 2 Automatic trip and all manual actions failed to shutdown the reactor and indication of an extreme challenge to the ability to cool the core exists.	**SS3** 1 2 Automatic trip failed to shutdown the reactor and manual actions taken from the reactor control console failed to shutdown the reactor.	**SA3** 1 2 Automatic trip failed to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor.	**SU3** 3 4 Inadvertent criticality.
Plant Monitoring			
	SS4 1 2 3 4 Loss of all monitoring functions for 15 minutes or longer with a SIGNIFICANT TRANSIENT in progress.	**SA4** 1 2 3 4 Loss of all monitoring functions for 15 minutes or longer.	**SU4** 1 2 3 4 Degradation of monitoring functions for 15 minutes or longer.
Technical Specification Limits			
			SU5 1 2 3 4 Inability to reach required operating mode within Technical Specification limits.
Communications			
			SU6 1 2 3 4 Loss of all onsite or offsite communications capabilities.
Reactor Coolant System Leakage			
			SU7 1 2 3 4 RCS leakage.
Fuel Clad Degradation			
			SU9 1 2 3 4 Fuel clad degradation.

SYSTEM MALFUNCTIONS - COLD

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Loss of AC Power			
		CA1 5 6 D Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer.	**CU1** 5 6 AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses.
Loss of DC Power			
			CU2 5 6 Loss of required DC power for 15 minutes or longer.
Failure of Protection System			
			CU3 5 6 Inadvertent criticality.
Communications			
			CU6 5 6 D Loss of all onsite or offsite communications capabilities.
Reactor Coolant System Leakage			
CG7 5 6 Loss of RPV inventory affecting fuel clad integrity with containment challenged.	**CS7** 5 6 Loss of RPV inventory affecting core decay heat removal capability.	**CA7** 5 6 Loss of RPV inventory.	**CU7** 5 RCS leakage.
			CU8 6 UNPLANNED Loss of RCS inventory.
Heat Sink			
		CA10 5 6 Inability to maintain plant in cold shutdown.	**CU10** 5 6 UNPLANNED Loss of decay heat removal capability.

Section 4: Emergency Response Facilities and Equipment

4.1 Unit Specific Emergency Response Facilities

A. Control Room

Plant operations are directed from the Control Room. Nuclear plant Instrumentation, Area and Process Radiation Monitoring System Instrumentation, Controls and Instrumentation for Reactor and Turbine Generator operation are provide here. The Control Room is located in Safeguards Building 2 - 53' Elevation. A description of the Control Room is contained in the Final Safety Analysis Report. Emergency equipment available to the Control Room is listed and maintained in accordance with Emergency Response Plan Implementation Procedures and/or Administrative procedures.

B. Technical Support Center

The Technical Support Center (TSC) is located on the Control Rooms floor level outside the Main Control Room and has a separate access. It is located in the fully hardened Safeguards Building. Thus the TSC is protected against radiological hazards, internal and external missiles, and seismic activity. Also, this arrangement ensures suitable ambient environmental conditions.

The TSC is sized to provide:

- Working space, without crowding, for the personnel assigned to the TSC at the maximum level of occupancy;
- Space for the TSC data system equipment needed to acquire, process, and display data used in the TSC;
- Sufficient space to perform repair, maintenance, and service of equipment, displays, and instrument;
- Space for data transmission equipment needed to transmit data originating in the TSC to other locations;
- Space for personnel access to functional displays of TSC data;
- Space for unhindered access to communications equipment by all TSC personnel who need communications capabilities to perform their functions;
- Space for storage of and/ or access to plant records and historical data; and
- A separate room adequate for at least three persons to be used for private NRC consultations.

In summary, the minimum size of working space of the TSC shall be 1875 square feet (174 square meters). This includes space for 25 personnel (5 which are NRC personnel) at 75 square feet (7 square meters)/person.

The TSC has the same protection from radiological hazards, including direct radiation and airborne radioactivity under accident conditions as the Control Room.

The TSC is provided with several means of communications within and outside the plant. Communications shall be established between the Control Room and the TSC, The EOF, the principle state and local EOCs, the monitoring teams and a general line throughout the site in accordance with the requirements of 10 CFR Part 50, Appendix E: Section (E)(9)(d).

Communications will also be established with NRC Headquarters and the appropriate Regional Office Operations Center, from the Control Room, TSC and EOF in accordance with 10 CFR, Appendix E: Section (E)(9)(d).

C. Operations Support Center

The Operations Support Center (OSC) is located in the Access Building within the Protected Area separate from Control Room and TSC. Both the Control Room and TSC shall have diverse means of communication with various plant locations including the OSC.

D. Onsite Laboratories

Chemistry laboratories located in the Nuclear Auxiliary Building are available for emergency response during an accident. The on-site laboratory sampling system is designed to provide gas and liquid samples of the containment atmosphere following an accident.

All modules, the sampling box and the local control cabinet are located in the Fuel Building. To ensure protection of the operating staff while taking a sample, in the sampling box, all modules and pipes which convey highly contaminated fluids are located behind a biological shield.

E. Decontamination Facilities

The personnel decontamination facility is located the Access Building and contains provisions for radiological decontamination of personnel, their wounds, supplies, instruments and equipment. This facility has extra clothing and decontaminants suitable for the type of contamination expected, including radioiodine skin contamination.

F. First Aid

The First Aid station located in the Access Building facilitates medical treatment and initial assessment of radiation exposure and uptake.

4.2 Assessment Resources

A. Onsite Meteorological Monitoring Instrumentation

{Section H.5.a of the Emergency Plan describes the BBNPP Meteorological instrumentation.}

B. Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area radiation monitoring system; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and is described in the following subsections.

1. Radiation Monitoring Systems

a. Area Radiation Monitoring

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

b. Radiological Noble Gas Effluent Monitoring

The wide range gas monitors are installed on normal station effluent release points. These monitors have the capability to monitor noble gas activity in the range of postulated accidents and in support of emergency response. Each monitor system has a microprocessor which utilizes digital processing techniques to analyze data and control monitor functions. These monitors provide readout and alarm functions to the Main Control Room.

c. Radioiodine and Particulate Effluent Monitoring

The wide range gas monitor includes a sampling rack for collection of the Auxiliary Building Vent Stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which utilizes a gamma spectrometer system.

d. High Range Containment Radiation Monitors

High range containment radiation monitors are installed for the U.S. EPR. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The monitors are in the range of postulated accidents and in support of emergency response.

e. In-plant Iodine Instrumentation

Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using silver zeolite as a sample media. It is expected that a sample can be obtained, purged, and analyzed for iodine content within a two-hour time frame.

f. Onsite Process Monitors

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

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

C. Onsite Fire Detection Instrumentation

The Plant Fire Alarm System (PFAS) is designed to meet the requirements of the applicable National Fire Protection Association (NFPA) Standards (e.g., NFPA 72, 13, 20, etc.) and detection is generally provided in areas containing safety related components/systems as recommended in Regulatory Guide 1.189, “Fire Protection for Operating Nuclear Power Plants.” The PFAS is furnished with electrically supervised circuits that monitor field input devices including smoke and heat detection, water supply and suppression supervisory devices and output devices such as suppression releasing and alarm notification devices. Instrumentation is provided in the Main Control Room and at the local fire control panels to alert operators of the location of a detected fire, the release of a suppression system, or the annunciation of a trouble condition within a portion of the system.

In the event that a portion of the PFAS is inoperable, compensatory measures may be required for the affected areas.

Further details on the unit’s Plant Fire Alarm system can be found in the unit’s FSAR.

D. Unit Specific Station Parameter Monitoring System

A process and information system provides access to all process information needed to monitor the state of the plant in all plant states, including accident conditions. The system displays information on workstations providing selected data to anyone with authorization to access the data. The system displays are used for:

- Reviewing the accident sequence,
- Determining appropriate mitigating actions,
- Evaluating the extent of any damage, and
- Determining plant status during recovery operations.

The ERO shall use the information obtained from the system to monitor plant parameters and provide recommendations to the operators.

Section 5: Emergency Measures

5.1 Unit Assembly Areas

Unit assembly areas have been identified at the Access Building, Radiation Protection Lab area, the clean hallways on the ground level of the Radioactive Waste Processing Building, and the shop areas of the Switchgear Building. Evacuation of non-essential personnel is usually conducted immediately after accountability if a Site Area Emergency or General Emergency has been declared and conditions permit.

If it is determined that the prearranged Assembly Area is unfit for personnel, the {Shift Supervisor} or the {Emergency Plant Manager} may designate an alternative Assembly Area and direct personnel using appropriate communication systems that are available.

5.2 Unit Evacuation Routes

Unit and Station Evacuation Routes will normally be via normal site egress routes. Alternate egress routes may be considered and are determined based on the event in progress and provided to evacuees over the unit's public address system. {The BBNPP alternate egress route is through a gate located on the west side of the BBNPP Protected Area where evacuees would proceed onto North Market Street.}

Enclosure A

{Bell Bend Nuclear Power Plant}
Summary Explanation
of
Emergency Action Levels

1.0 INTRODUCTION

On October 8, 2003, the Nuclear Regulatory Commission (NRC) issued Regulatory Issue Summary (RIS) 2003-18, “Use of NEI 99-01, Methodology for Development of Emergency Action Levels” as guidance in developing or changing a standard emergency or action level scheme. NEI 99-01, "Methodology for Development of Emergency Action Levels" (Revision 5, February 2008), represents the latest Emergency Action Level (EAL) methodology. Revision 5 was approved for use by the NRC in February 2008.

RIS 2003-18 and its two supplements provide guidance on information to be included for EAL submittals to the NRC. The following information is contained in this submittal package:

- Enclosure A: Summary Explanation
- Enclosure B: Detailed Justification

  Attachment 1, Description of Changes and Technical Basis

  Attachment 2, EAL Comparison Table
- Enclosure C: New EALs and Bases Manual
- Enclosure D: State/Local Government Agreement Documentation

An enclosure providing a list of supporting technical information as recommended by the RIS is not provided separately with this EAL submittal package. The information applicable to this enclosure is referenced as part of the COL application.

This enclosure (Enclosure A) provides a general explanation of the considerations applicable to the {Bell Bend Nuclear Power Plant (BBNPP)} EALs and an outline of the contents in this submittal package.

2.0 DISCUSSION

An initial set of Emergency Action Levels (EALs) for the {Bell Bend Nuclear Power Plant (BBNPP)}, a U.S. Evolutionary Power Reactor (U.S. EPR) has been developed. This initial set of EALs is based on NEI 99-01 Rev 5 with appropriate changes added to include plant design characteristics unique to the U.S. EPR. The intent of this initial set of {BBNPP} EALs is to provide consistent emergency classifications internally and between the U.S. EPR plants to the greatest extent possible, limited only by plant specific design or location.

2.1 EAL Cross References

As discussed above, the {BBNPP} EALs are primarily based on NEI 99-01 Rev 5. However, the addition and deletion of Initiating Conditions (ICs) and EALs since endorsement of the original guidance document has led to an inconsistent sequencing of the identification codes. To correct this for human factors consideration, the {BBNPP} IC and EAL sequence has been developed to provide a consistent code progression associated with each recognition category sub-group. Attachment 1 of Enclosure B provides cross reference tables for simple association of the NEI and {BBNPP} IC identification codes.

2.1 Differences and Deviations

RIS 2003-18, Supplement 1, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels," was issued by the NRC on July 13, 2004. The RIS included definitions of what is considered an EAL difference and deviation.

> *A <u>difference</u> is where the site specific EAL, as compared to the basis scheme guidance, differs in wording but agrees in meaning and intent such that classification of the event would be the same.*
>
> *A <u>deviation</u> is where the site specific EAL, as compared to the basis scheme guidance, differs in wording and is altered in meaning or intent such that classification of the event could be different.*

An EAL comparison table is given in Attachment 1 of Enclosure B to provide simple method for contrasting and assessing the differences and deviations between the {BBNPP} and NEI EAL sets.

Any {BBNPP} EAL (or IC, Fuel Product Barrier (FPB) threshold value or bases statement) that has been evaluated as not meeting the meaning and intent of the NEI 99-01 Rev 5 guidelines are identified as deviations and are listed as such in Attachment 1 of Enclosure B. The basis for each deviation has been documented in the technical evaluation section to describe the rational for not adopting the specific NEI guidance wording. Deviations in this evaluation have been separated to include comparisons with the endorsed NEI 99-01 Rev 5 version. The deviations identified and presented in this submittal provide justification that the proposed EAL revisions in aggregate do not constitute a decrease in effectiveness and alternative methods, where appropriate, are in place to ensure the intent of the NEI 99-01 EAL is maintained. The proposed EALs will continue to satisfy the criteria of Appendix E to 10 CFR Part 50 as well as 10 CFR 50.47(b).

An EAL comparison table, Attachment 2 of Enclosure B, is provided in the format given below to allow easy comparison between the wording for NEI 99-01 Rev 5 against the {BBNPP} EALs:

NEI 99-01, Rev 5	{BBNPP} EALs	Difference/Deviation
EAL Identifier: Initiating Condition: Mode Applicability: EAL(s):	EAL Identifier: Initiating Condition: Mode Applicability: EAL(s):	Rev 4/Rev 5 Differences: Rev 4/Rev 5 Deviations:

RIS 2003-18, Supplement 2, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels," was issued by the NRC on December 12, 2005. This RIS included expanded clarification on differences and deviations, as well as administrative changes that are neither differences nor deviations. Examples of global differences and administrative changes utilized in the {BBNPP} EALs include the following:

- Use of a different numbering scheme than the NEI 99-01 scheme without changing the intent of the overall EAL scheme.
- Transfer of information from the basis section into the actual EAL that does not change the intent of the EAL.
- Use of synonymous wording.
- EAL format written to conform to site specific writers guides.
- Use of the phrase "Unusual Event" versus "Notification of Unusual Event" to sustain common terminology.

2.3 Operational Modes

The {BBNPP} operational modes are contained in the {BBNPP} EAL Technical Bases Manual provided in Enclosure C. Operational mode values are as follows:

Mode	Reactivity Condition, K_{eff}	% Rated Thermal Power*	Average Reactor Coolant Temperature
1) Power Operation	≥ 0.99	> 5%	N/A
2) Startup	≥ 0.99	≤ 5%	N/A
3) Hot Standby	< 0.99	N/A	≥ 350° F
4) Hot Shutdown	< 0.99	N/A	350° F > T_{AVG} > 200° F
5) Cold Shutdown	< 0.99	N/A	≤ 200° F
6) Refueling	One or more vessel head closure bolts less than fully tensioned.		
D) Defueled	All reactor fuel removed from reactor pressure vessel (full core off load during refueling or extended outage).		

* Excluding decay heat.

2.4 {BBNPP} EALs and Technical Bases

The {BBNPP} EAL Technical Bases Manual is provided in Enclosure C. Its sections provide the following content:

- Emergency Classification Level (ECL) discussion
- Initiating Condition (IC) discussion
- Emergency Action Level (EAL) and Fission Product Barrier (FPB) discussion
- Operating Mode Applicability
- Definitions for terms having specific meaning to the EALs.
- EAL Matrix Table designed as an evaluation tool used by qualified ERO members to determine, classify and declare emergency events.
- Technical Bases documentation for each EAL and FPB.

2.5 State/Local Government Agreement Documentation

Per 10 CFR Part 50, Appendix E, Section IV.B, initial EALs developed by licensees must be agreed on by offsite emergency response authorities and approved by the NRC prior to implementation.

The applicant worked closely with the state and local government agencies in accordance with the regulatory requirements and guidance. Since a standard EAL scheme for the U.S. EPR has yet to be endorsed by the NRC, state and local agencies have agreed with the scheme used in the development of the EALs. Copies of these agreements are provided in Enclosure D.

3.0 APPLICABLE REGULATIONS AND GUIDANCE

The applicable regulations and guidance that must be met for the Emergency Plans, and changes to EALs, are described below:

3.1 Regulations

Paragraph (a)(1) to Section 10 CFR 50.47, “Emergency Plans,” states that no operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. §50.47 establishes onsite and offsite emergency response plan standards that must met for the NRC staff to make a positive finding that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. One of these standards, §50.47(b)(4), stipulates that Emergency Plans include a standard emergency classification and action level scheme.

Section IV.B to 10 CFR 50 Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities,” provides that Emergency Plans include EALs, which are to be used as criteria for determining the need for notification and participation of local and State agencies, and for determining when and what type of protective measures should be considered to protect the health and safety of individuals both onsite and offsite. EALs are to be based on plant conditions and instrumentation, as well as onsite and offsite radiological monitoring. Appendix E Section IV.B provides that initial EALs shall be discussed and agreed on by the applicant and State and local authorities, be approved by the NRC, and reviewed annually thereafter with State and local authorities.

3.2 Guidance

Revision 4 to Regulatory Guide 1.101 endorsed the guidance contained in NEI 99-01, Revision 4, and is acceptable to the NRC staff as an alternative method to that described in the following guidance for developing EALs required in Section IV.B to Appendix E of 10 CFR Part 50 and 10 CFR 50.47(b)(4):

- Appendix 1 to NUREG-O654/FEMA-REP-I, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants” (November 1980)
- Nuclear Utilities Management Council (NUMARC) document, entitled NESP-007, “Methodology for Development of Emergency Action Levels” (Revision 2, January 1992).

Regulatory Issue Summary (RIS) 2003-18, “Use of NEI 99-01, Methodology for Development of Emergency Action Levels,” dated October 8, 2003, provides guidance for developing or changing a standard emergency classification and action level scheme. In addition, RIS 2003-18 provides recommendations to assist licensees, consistent with Section IV.B to Appendix E of Part 50, in determining whether to seek prior NRC approval of deviations from the new guidance. Supplement 1 to RIS 2003-18, dated July 13, 2004, and Supplement 2 to RIS 2003-18, dated December 12, 2005, were issued to clarify various technical positions regarding EAL revisions.

Enclosure B

{Bell Bend Nuclear Power Plant}

EAL Comparisons
and
Technical Bases for Changes

BBNPP TO NEI 99-01 Rev 5 IC CROSS REFERENCE TABLES

The following tables provide cross-references between the NEI 99-01 IC identification number and the BBNPP IC identification number:

NEI Rev 5 to BBNPP

NEI	BBNPP	NEI	BBNPP
FU1	FU1	SU1	SU1
FA1	FA1	SU2	SU5
FS1	FS1	SU3	SU4
FG1	FG1	SU4	SU9
		SU5	SU7
FC1	N/A	SU6	SU6
FC2	FC7	SU8	SU3
FC3	FC3	SA2	SA3
FC4	FC4	SA4	SA4
FC6	FC2	SA5	SA1
FC7	N/A	SS1	SS1
FC8	FC10	SS2	SS3
		SS3	SS2
RC1	N/A	SS6	SS4
RC2	RC5	SG1	SG1
RC4	RC6	SG2	SG3
RC6	RC2		
RC7	N/A	CU1	CU7
RC8	RC10	CU2	CU8
		CU3	CU1
CT1	N/A	CU4	CU10
CT2	CT8	CU6	CU6
CT3	CT3	CU7	CU2
CT4	CT6	CU8	CU3
CT5	CT9	CA1	CA7
CT6	CT2	CA3	CA1
CT7	N/A	CA4	CA10
CT8	CT10	CS1	CS7
		CG1	CG7
AU1	RU1		
AU2	RU2	HU1	HU3
AA1	RA1	HU2	HU4
AA2	RA2	HU3	HU5
AA3	RA3	HU4	HU1
AS1	RS1	HU5	HU6
AG1	RG1	HA1	HA3
		HA2	HA4
		HA3	HA5
		HA4	HA1
		HA5	HA2
		HA6	HA6
		HS2	HS2
		HS3	HS6
		HS4	HS1
		HG1	HG1
		HG2	HG6

BBNPP to NEI Rev 5

BBNPP	NEI	BBNPP	NEI
FG1	FG1	SG1	SG1
FS1	FS1	SS1	SS1
FA1	FA1	SA1	SA5
FU1	FU1	SU1	SU1
		SS2	SS3
N/A	FC1	SG3	SG2
FC2	FC6	SS3	SS2
FC3	FC3	SA3	SA2
FC4	FC4	SU3	SU8
FC7	FC2	SS4	SS6
N/A	FC7	SA4	SA4
FC10	FC8	SU4	SU3
		SU5	SU2
N/A	RC1	SU6	SU6
RC2	RC6	SU7	SU5
RC5	RC2	SU9	SU4
RC6	RC4		
N/A	RC7	CA1	CA3
RC10	RC8	CU1	CU3
		CU2	CU7
N/A	CT1	CU3	CU8
CT2	CT6	CU6	CU6
CT3	CT3	CG7	CG1
CT6	CT4	CS7	CS1
N/A	CT7	CA7	CA1
CT8	CT2	CU7	CU1
CT9	CT5	CU8	CU2
CT10	CT8	CA10	CA4
		CU10	CU4
RG1	AG1		
RS1	AS1	HG1	HG1
RA1	AA1	HS1	HS4
RU1	AU1	HA1	HA4
RA2	AA2	HU1	HU4
RU2	AU2	HS2	HS2
RA3	AA3	HA2	HA5
		HA3	HA1
		HU3	HU1
		HA4	HA2
		HU4	HU2
		HA5	HA3
		HU5	HU3
		HG6	HG2
		HS6	HS3
		HA6	HA6
		HU6	HU5

SUMMARY OF DEVIATIONS FROM NEI 99-01

The following tables identify EAL changes that have been evaluated as deviations from the NEI guidance documents and will require prior NRC approval before implementation. A detailed description of the changes and basis for the changes are contained in a following section.

Deviations from NEI 99-01 Rev 5

#	NEI	BBNPP	NEI Guidance	Deviation
1	CT2	CT8	Includes PL threshold for loss of containment depressurization equipment.	U.S. EPR design is such that this threshold is not applicable.
2	SS6 SA6 SU6	SS4 SA4 SU4	Specifies loss of approximately greater than 75% of plant monitoring instruments in the control room.	U.S. EPR design includes digital monitoring system. Compensatory indication is not applicable to U.S. EPR. Removed significant transient from the Alert to provide progression to SAE EAL.

Deviation 1

NEI EAL: CT2 **U.S. EPR EAL:** CT8

Operational Modes: 1, 2, 3, 4

Description of the Deviation

NEI potential loss threshold 3 specifies containment pressure at the depressurization actuation setpoint with insufficient equipment (sprays and coolers) in operation.

U.S. EPR containment design is such that the design basis accidents do not reach containment design pressure, and therefore there is no automatic depressurization actuation setpoint.

Technical Basis

The U.S. EPR containment volume, condensation surface area, and heat capacities are such that the containment design pressure is not exceeded during design basis Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) events, In addition, the containment pressure decreases to less than 50% of the accident analysis values in less than 24 hours thus ensuring that radiological dose consequences are acceptable. Mass and energy releases to the containment during LOCA and MSLB events were calculated using RELAP5/MOD2 (B&W), which is an NRC approved methodology. Containment pressure responses were calculated using the GOTHIC code, also an NRC approved methodology. An automatically actuated containment spray system is therefore not required to mitigate the consequences of a Design Basis Accident, so no automatic actuation setpoint exists for this EAL threshold to be based.

Supporting Information

U.S. EPR FSAR – Section 6.2.1

U.S. EPR FSAR – Section 6.2.2

U.S. EPR FSAR – Section 6.5.2

U.S. EPR FSAR – Section 15.0.3

U.S. EPR FSAR – Section 19.2.3.3

Deviation 2

NEI EAL: SS6, SA6, SU6 **U.S. EPR EAL:** SS4, SA4 and SU4

Operational Modes: 1, 2, 3, 4

Description of the Deviation

NEI specified plant annunciation and safety indication EALs to be set at a loss of *all or most* (*approximately greater than 75%*).

U.S. EPR specified the EALs to involve a complete loss of the systems that provide annunciation and safety indication (PICS and SICS). Additionally, it removed the Alert significant transient condition to provide progression to the SAE EAL.

Technical Basis

<u>Annunciation/Indication:</u>

The operator-managed control system of the U.S. EPR consists of two integrated subsystems (Process Information Control System (PICS) and Safety Information and Control System (SICS)) each having a substantial degree of redundancy. The U.S. EPR design provides redundant safety system indications powered from separate uninterruptible power supplies. Being one integrated system managing multiple redundant inputs, the availability of annunciation (alarms) and indication are not separable. Therefore, the loss of annunciation will occur only concurrent with the loss of indication. The loss of safety system indicators impacts the determination of the operability status of that specific system or component. System operability status will be further addressed by the system-based EALs directly impacted by those systems.

<u>Quantification of Failure:</u>

Quantification of percentage failure is not useful in a digital control system. The digital control system is an integrated set of fault-tolerant components as compared to an analog control system, which is an assembly of multiple unrelated independent circuits. The failure of fault-tolerant components will likely not show degraded performance in an escalating manner. Failure is anticipated to be a step change (functional to non-functional) instead of a gradual degradation. Once the step change in performance has occurred, the system will likely no longer be operational. This contrasts with the gradual degradation of analog systems as individual circuits are lost.

<u>Compensatory Indicators:</u>

Each subsystem (PICS or SICS) is designed to be independently capable of providing necessary alarms and indications. The total loss of annunciators or indications would therefore require the loss of both PICS and SICS subsystems. The loss of either a PICS or SICS subsystem alone would leave one fully operable subsystem which would continue to provide all indication and annunciation necessary to manage transients.

This exceeds the typical "compensatory indications" which would still be burdened by the loss of alarms/annunciation.

PICS Operability:

PICS will be considered inoperable if:

a. Less than two PICS workstations operable (a workstation is considered operable if 3 or more screens are fully functional)

OR

b. Data on the PICS is unreliable (e.g. system froze due to common mode application software failure)

SICS Operability:

Based on the fact that the SICS includes a reduced inventory of alarms and indications, one operator should be able to manage all alarms and indications for the safety related parameters on the SICS. Therefore, a loss of all four divisions on both workstations would constitute this loss because the qualified display system monitors of the SICS have the capability to display all four divisions of SICS indications on a single qualified display system monitor.

EAL Comparison

UNUSUAL EVENT - This Initiating Condition (IC) and its associated EAL are intended to recognize the difficulty associated with monitoring plant conditions with degradation of a major portion of the annunciation/indication equipment.

Each subsystem (PICS or SICS) is designed to be fully capable of providing alarms and indications of key safety-related parameters. The total loss of annunciators or indications would require the loss of both PICS and SICS subsystems. The loss of both PICS and SICS subsystems would necessarily include loss of compensatory indications which would meet Alert EAL SA4 criteria (therefore no NOUE could be declared).

Total failure of a single subsystem is a highly unlikely event and establishing an escalation pathway from Unusual Event to Alert to Site Area Emergency is desirable. Therefore, the U.S. EPR has chosen to conservatively establish the total failure of either subsystem (PICS or SICS) as an Unusual Event.

ALERT - This IC and its associated EALs are intended to recognize the difficulty associated with monitoring plant conditions with loss of a major portion of the annunciation/indication equipment.

Two distinct EAL combinations exists under this NEI EAL:

1. NEI EAL 1A and 1B Bullet 1 (Loss of Annunciation/Indication and Transient)

Each subsystem (PICS or SICS) is designed to be fully capable of providing key safety-related alarms and indications for detecting and managing the transient. Since the total loss of annunciator/indications (Loss of both PICS and SICS) excludes the availability compensatory indications (Operability of either PICS or SICS), there is no equivalent condition to loss of annunciator/indications and transient WITH compensatory indicators available. Conditions meeting NEI EAL Criteria 1A , 1B Bullet 1, and 1B Bullet 2 would instead meet the criteria for a Site Area Emergency under EAL SS4.

The U.S. EPR therefore takes exception to this combination of EAL criteria.

2. NEI EAL 1A and 1B Bullet 2 (Loss of Annunciation/Indication and Compensatory Indication)

U.S. EPR condition 1A and 1B (Loss of PICS and Loss of SICS) is equivalent to NEI conditions 1A and 1B bullet 2 (Loss of annunciation/indication and Loss of compensatory indication).

While there is a difference due to the inherent integration of compensatory indication into each of the two digital subsystems (PICS and SICS), there is no deviation from the intent of this EAL threshold combination.

SITE AREA EMERGENCY - This IC is intended to recognize the threat to plant safety associated with the complete loss of capability of the control room staff to monitor plant response to a SIGNIFICANT TRANSIENT.

A Site Area Emergency is considered to exist if the control room staff cannot monitor safety functions needed for protection of the public while a significant transient is in progress. Quantification is arbitrary; however, if most or all safety system annunciators or indicators are fully lost, there is an increased risk that a degraded plant condition could go undetected.

The U.S. EPR is designed to survive a full offsite load rejection and maintain onsite house loads. Although actions will automatically occur, the inability of the operators to verify proper response increases risk and justifies escalation of emergency classification. A 50% change in power/electrical load was chosen as a reasonable value, less than the design criteria, which was still a substantial challenge to the systems as the threshold criteria.

U.S. EPR deviation in the definition of a significant transient is appropriate for this type of design and is consistent with the conditions warranting an SAE for other reactor design types.

Supporting Information

None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
UNPLANNED: A parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.	**UNPLANNED:** A parameter change or an event, the reasons for which may be known or unknown, that is not the result of an intended evolution and requires corrective or mitigative actions.	**Differences** Added words to allow the term 'unexplained' to fall within the broader context of unplanned. **Deviations** None
Fission Product Barrier Degradation		
FG1 Loss of ANY two barriers AND Loss or Potential Loss of the third barrier. **Operating Mode Applicability:** Power Operation, Hot Standby, Startup, Hot Shutdown	**FG1** **Initiating Condition:** Loss of any two barriers and loss or potential loss of the third barrier. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** Refer to fission product barrier loss and potential loss threshold values to determine barrier status.	**Differences** None **Deviations** None
FS1 Loss or Potential Loss of ANY two barriers. **Operating Mode Applicability:** Power Operation, Hot Standby, Startup, Hot Shutdown	**FS1** **Initiating Condition:** Loss or potential loss of any two barriers. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** Refer to fission product barrier loss and potential loss threshold values to determine barrier status.	**Differences** None **Deviations** None
FA1 ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS. **Operating Mode Applicability:** Power Operation, Hot Standby, Startup, Hot Shutdown	**FA1** **Initiating Condition:** Any loss or any potential loss of either fuel clad or RCS. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** Refer to fission product barrier loss and potential loss threshold values to determine barrier status.	**Differences** None **Deviations** None
FU1 ANY Loss or ANY Potential Loss of Containment. **Operating Mode Applicability:** Power Operation, Hot Standby, Startup, Hot Shutdown	**FU1** **Initiating Condition:** Any loss or any potential loss of containment. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** Refer to fission product barrier loss and potential loss threshold values to determine barrier status.	**Differences** None **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
Fuel Clad Barrier		
1. Critical Safety Function Status **Loss** A. Core Cooling - Red Entry Conditions Met. **Potential Loss** A. Core Cooling - Orange Entry Conditions Met. **OR** B. Heat Sink - Red Entry Conditions Met.	N/A	**Note:** U.S. EPR does not use CSFST for plant operations. **Differences** N/A **Deviations** N/A
6. Containment Radiation Monitoring **Loss** A. Containment radiation monitor reading greater than (site specific value). **Potential Loss** Not Applicable	**FC2: Containment Radiation Monitoring** **Loss** 1. Containment radiation monitor ({JYK15 CR101}) **> {Graph FC2(L)1}**. **Potential Loss** None	**Differences** Removed the word 'reading' for human factors considerations (minimize extraneous words). **Deviations** None
3. Core Exit Thermocouple Readings **Loss** A. Core exit thermocouples reading greater than (site specific degree F). **Potential Loss** A. Core exit thermocouples reading greater than (site specific degree F).	**FC3: Core Temperature** **Loss** 1. **{**Calculated Clad Temperature in **Region 3 or higher}**. **Potential Loss** 1. **{**Calculated Clad Temperature in **Region 2}**.	**Differences** Used a generalized FPB category title as U.S. EPR does not use CETCs. U.S. EPR uses in-core TCs to develop calculated clad temps which are approximately equivalent to the generic bases. **Deviations** None
4. Reactor Vessel Water Level **Loss** Not Applicable **Potential Loss** A. RCS/RPV level less than (site specific level for TOAF).	**FC4: RPV Level** **Loss** None **Potential Loss** 1. a. RCS level ({JEF10 CL081}) **< {FC4(PL)1.a}**. **AND** b. **{**Calculated Clad Temperature in **Region 2 or higher}**.	**Differences** U.S. EPR cannot measure to TOAF in hot modes. Level indicates lowest measurable value in these modes and includes a threshold for loss of subcooling. This combination is consistent with the meaning and intent of NEI 99-01. **Deviations** None
2. Primary Coolant Activity Level **Loss** A. Coolant activity greater than (site specific value). **Potential Loss** Not Applicable	**FC7: RCS Activity** **Loss** 1. Coolant activity **> 300 µCi/gm** Dose Equivalent I-131. **Potential Loss** None	**Differences** None **Deviations** None
7. Other Site Specific Indications **Loss** A. (Site specific) as applicable. **Potential Loss** A. (Site specific) as applicable.	N/A	**Note:** U.S. EPR does not have any additional FPB thresholds in this category. **Differences** N/A **Deviations** N/A

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
8. Emergency Director Judgment **Loss** A. Any condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier. **Potential Loss** A. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.	**FC10: Emergency Director Judgment** **Loss** 1. Any condition in the opinion of the Emergency Director that indicates loss of the fuel clad barrier. **Potential Loss** 1. Any condition in the opinion of the Emergency Director that indicates potential loss of the fuel clad barrier.	**Differences** None **Deviations** None
RCS Barrier		
1. Critical Safety Function Status **Loss** Not Applicable **Potential Loss** A. RCS Integrity - Red Entry Conditions Met. **OR** B. Heat Sink - Red Entry Conditions Met.	N/A	**Note:** U.S. EPR does not use CSFST for plant operations. **Differences** N/A **Deviations** N/A
6. Containment Radiation Monitoring **Loss** A. Containment radiation monitor reading greater than (site specific value). **Potential Loss** Not Applicable	**RC2: Containment Radiation Monitoring** **Loss** 1. Containment radiation monitor ({JYK15 CR101}) **> {RC2(L)1} R/hr**. **Potential Loss** None	**Differences** Removed the word 'reading' for human factors considerations (minimize extraneous words). **Deviations** None
2. RCS Leak Rate **Loss** A. RCS leak rate greater than available makeup capacity as indicated by a loss of RCS subcooling. **Potential Loss** A. RCS leak rate greater than (site specific capacity of one charging pump in the normal charging mode) with Letdown isolated.	**RC5: RCS Leak Rate** **Loss** 1. RCS leak rate greater than available makeup capacity as indicated by **{**Calculated Clad Temperature in **Region 2 or higher}**. **Potential Loss** 1. RCS leak rate requires operation of second charging pump to maintain pressurizer level.	**Differences** None **Deviations** None
4. SG Tube Rupture **Loss** A. RUPTURED SG results in an ECCS (SI) actuation. **Potential Loss** Not Applicable	**RC6: SG Tube Leakage / Rupture** **Loss** 1. RUPTURED SG results in an MHSI actuation. **Potential Loss** None	**Differences** Added leakage to FPB category title to allow for consistent numbering with CT6 (NEI CT4). **Deviations** None
7. Other Site Specific Indications **Loss** A. (site specific) as applicable. **Potential Loss** A. (site specific) as applicable.	N/A	**Note:** U.S. EPR does not have any additional FPB thresholds in this category. **Differences** N/A **Deviations** N/A

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
8. Emergency Director Judgment **<u>Loss</u>** A. Any condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier. **<u>Potential Loss</u>** A. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.	**RC10: Emergency Director Judgment** **<u>Loss</u>** 1. Any condition in the opinion of the Emergency Director that indicates loss of the RCS barrier. **<u>Potential Loss</u>** 1. Any condition in the opinion of the Emergency Director that indicates potential loss of the RCS barrier.	**<u>Differences</u>** None **<u>Deviations</u>** None
Containment Barrier		
1. Critical Safety Function Status **<u>Loss</u>** Not Applicable **<u>Potential Loss</u>** A. Containment - Red Entry Conditions Met.	N/A	**<u>Note:</u>** U.S. EPR does not use CSFST for plant operations. **<u>Differences</u>** N/A **<u>Deviations</u>** N/A
6. Containment Radiation Monitoring **<u>Loss</u>** Not Applicable **<u>Potential Loss</u>** A. Containment radiation monitor reading greater than (site specific value).	**CT2: Containment Radiation Monitoring** **<u>Loss</u>** None **<u>Potential Loss</u>** 1. Containment radiation monitor ({JYK15 CR101}) **> {Graph CT2(L)1}**.	**<u>Differences</u>** Removed the word 'reading' for human factors considerations (minimize extraneous words). **<u>Deviations</u>** None
3. Core Exit Thermocouple Readings **<u>Loss</u>** Not Applicable **<u>Potential Loss</u>** A. a. Core exit thermocouples in excess of (site specific)º F. **AND** b. Restoration procedures not effective within 15 minutes. **OR** B. a. Core exit thermocouples in excess of (site specific)º F. **AND** b. Reactor vessel level below (site specific level). **AND** c. Restoration procedures not effective within 15 minutes.	**CT3: Core Temperature** **<u>Loss</u>** None **<u>Potential Loss</u>** 1. a. **{**Calculated Clad Temperature in **Region 4}**. **AND** b. Restoration procedures not effective within **15 minutes**. **OR** 2. a. **{**Calculated Clad Temperature in **Region 3}**. **AND** b. RCS level ({JEF10 CL081}) **< {CT3(PL)2.b}**. **AND** c. Restoration procedures not effective within **15 minutes**.	**<u>Differences</u>** Used a generalized FPB category title as U.S. EPR does not use CETCs. U.S. EPR uses in-core TCs to develop calculated clad temps which are approximately equivalent to the generic bases. **<u>Deviations</u>** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
4. SG Secondary Side Release with P to S Leakage **Loss** A. RUPTURED SG is also FAULTED outside of containment. **OR** B. a. Primary-to-Secondary leak rate greater than 10 gpm. **AND** b. UNISOLABLE steam release from affected SG to the environment. **Potential Loss** Not Applicable	**CT6: SG Tube Leakage / Rupture** **Loss** 1. RUPTURED SG is also FAULTED outside of containment. **OR** 2. a. Primary-to-Secondary leak rate **> 10 gpm**. **AND** b. UNISOLABLE steam release from affected SG to the environment. **Potential Loss** None	**Differences** Revised FPB category title to allow for consistent numbering with RC6 (NEI RC4). **Deviations** None
2. Containment Pressure **Loss** A. A containment pressure rise followed by a rapid unexplained drop in containment pressure. **OR** B. Containment pressure or sump level response not consistent with LOCA conditions. **Potential Loss** A. Containment pressure greater than (site specific value) and rising. **OR** B. Explosive mixture exists inside containment. **OR** C. a. Pressure greater than containment depressurization actuation setpoint. **AND** b. Less than one full train of depressurization equipment operating.	**CT8: Containment Pressure** **Loss** 1. A containment pressure rise followed by a rapid UNPLANNED drop in containment pressure. **OR** 2. Containment pressure or IRWST level response not consistent with LOCA conditions. **Potential Loss** 1. Containment pressure **> 62 psig** and rising. **OR** 2. Containment Hydrogen **> 4%.**	**Differences** Replace 'unexplained' with unplanned to prevent potential confusion in the use of separate terms. **Deviations (Deviation #1)** (PL)C: This FPB threshold was not used. Containment spray and coolers are not safety related or credited for emergency depressurization actuation conditions at U.S. EPR.
5. CNMT Isolation Failure or Bypass **Loss** A. a. Failure of all isolation valves in any one line to close. **AND** b. Direct downstream pathway to the environment exists after containment isolation signal. **Potential Loss** Not Applicable	**CT9: Containment Isolation Failure or Bypass** **Loss** 1. a. Failure of **ALL** isolation valves in any one line to close. **AND** b. Direct downstream pathway to the environment exists after containment isolation signal. **Potential Loss** None	**Differences** None **Deviations** None
7. Other Site Specific Indications **Loss** A. (site specific) as applicable. **Potential Loss** A. (site specific) as applicable.	N/A	**Note:** U.S. EPR does not have any additional FPB thresholds in this category. **Differences** N/A **Deviations** N/A

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
8. Emergency Director Judgment **Loss** A. Any condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier. **Potential Loss** A. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.	**CT10: Emergency Director Judgment** **Loss** 1. Any condition in the opinion of the Emergency Director that indicates loss of the containment barrier. **Potential Loss** 1. Any condition in the opinion of the Emergency Director that indicates potential loss of the containment barrier.	**Differences** None **Deviations** None
Abnormal Radiological Condition / Abnormal Rad Effluent Releases		
AG1 **Initiating Condition - GENERAL EMERGENCY** Off-site dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mrem TEDE or 5000 mrem Thyroid CDE for the actual or projected duration of the release using actual meteorology. **Operating Mode Applicability:** All **Example Emergency Action Levels:** (1 or 2 or 3 or 4) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results. 1. VALID reading on **ANY** of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site specific monitor list and threshold values) 2. Dose assessment using actual meteorology indicates doses greater than 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond the site boundary. 3. VALID perimeter radiation monitoring system reading greater than 1000 mR/hr for 15 minutes or longer. {for sites having telemetered perimeter monitors} 4. Field survey results indicate closed window dose rates greater than 1000 mR/hr expected to continue for 60 minutes or longer; or analyses of field survey samples indicate thyroid CDE greater than 5000 mrem for one hour of inhalation, at or beyond site boundary.	**RG1** **Initiating Condition:** Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mRem TEDE or 5000 mRem CDE Child Thyroid for the actual or projected duration of the release using actual meteorology. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** **Note:** If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results. 1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RG1.1} μCi/hr** for **15 minutes** or longer. **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER** of the following: • **> 1000 mRem** TEDE • **> 5000 mRem** CDE Child Thyroid **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER** of the following: • Gamma (closed window) dose rate **> 1000 mR/hr** for **60 minutes** or longer. • Air samples analysis **> 5000 mRem** CDE Child Thyroid for one hour of inhalation.	**Note:** Changes to the nesting format of EALs RG1.2 and RG1.3 are considered administrative. **Differences** Revised PAG to CDE Child Thyroid for provide consistency with the State of Pennsylvania. The first note sentence has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. Removed 'VALID'. All EALs and FBPs presume valid indications, reports or conditions as explained in the classification description and instructions section. Valid is a fundamental instruction for classification, not a threshold criterion. Removed the word 'reading' for human factors considerations (minimize extraneous words). NEI AG1.3 is N/A for BBNPP because the site is not equipped with a perimeter radiation monitoring system. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
AS1 **Initiating Condition - SITE AREA EMERGENCY** Off-site dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 100 mrem TEDE or 500 mrem Thyroid CDE for the actual or projected duration of the release. **Operating Mode Applicability:** All **Example Emergency Action Levels:** (1 or 2 or 3 or 4) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results. 1. VALID reading on **ANY** of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site specific monitor list and threshold values) 2. Dose assessment using actual meteorology indicates doses greater than 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the site boundary. 3. VALID perimeter radiation monitoring system reading greater than 100 mR/hr for 15 minutes or longer. {for sites having telemetered perimeter monitors} 4. Field survey results indicate closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer; or analyses of field survey samples indicate thyroid CDE greater than 500 mrem for one hour of inhalation, at or beyond the site boundary.	**RS1** **Initiating Condition:** Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 100 mRem TEDE or 500 mRem CDE Child Thyroid for the actual or projected duration of the release using actual meteorology. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** **Note:** If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results. 1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RS1.1} µCi/hr** for **15 minutes** or longer. **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER** of the following: • **> 100 mRem** TEDE • **> 500 mRem** CDE Child Thyroid **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER** of the following: • Gamma (closed window) dose rate **> 100 mR/hr** for **60 minutes** or longer. • Air sample analysis **> 500 mRem** CDE Child Thyroid for one hour of inhalation.	**Note:** Changes to the nesting format of EALs RS1.2 and RS1.3 are considered administrative. **Differences** Revised PAG to CDE Child Thyroid for provide consistency with the State of Pennsylvania. Added IC wording "using actual meteorology" to be consistent with the EAL, basis and RG1 IC (NEI AG1). The first note sentence has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. Removed 'VALID'. All EALs and FBPs presume valid indications, reports or conditions as explained in the classification description and instructions section. Valid is a fundamental instruction for classification, not a threshold criterion. Removed the word 'reading' for human factors considerations (minimize extraneous words). NEI AS1.3 is N/A for BBNPP because the site is not equipped with a perimeter radiation monitoring system. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
AA1 **Initiating Condition - ALERT** Any release of gaseous or liquid radioactivity to the environment greater than 200 times the Radiological Effluent Technical Specifications/ODCM for 15 minutes or longer. **Operating Mode Applicability:** All **Example Emergency Action Levels:** (1 or 2 or 3 or 4 or 5) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown. 1. VALID reading on **ANY** of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site specific monitor list and threshold values) 2. VALID reading on any effluent monitor reading greater than 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer. 3. Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates greater than 200 times (site specific RETS values) for 15 minutes or longer. 4. VALID reading on perimeter radiation monitoring system reading greater than 10.0 mR/hr above normal* background for 15 minutes or longer. {for sites having telemetered perimeter monitors} 5. VALID indication on automatic real-time dose assessment capability indicating greater than (site specific value) for 15 minutes or longer. {for sites having such capability} * Normal can be considered as the highest reading in the past twenty-four hours excluding the current peak value.	**RA1** **Initiating Condition:** Any release of gaseous or liquid radioactivity to the environment greater than 200 times the ODCM limit for 15 minutes or longer. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** **Note:** In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown. 1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RA1.1} μCi/hr** for **15 minutes** or longer. **OR** 2. **ANY** of the following effluent monitors **> 200 times the ODCM limit** established by a current radioactivity discharge permit for **15 minutes** or longer: • Rad Waste Building Transfer Tank Discharge Line Activity Monitor ({KPK29 CR001/002}) • Discharge permit specified monitor **OR** 3. Confirmed sample analysis for gaseous or liquid releases **> 200 times the ODCM limit** for **15 minutes** or longer.	**Differences** The first note sentence has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. Removed 'VALID'. All EALs and FBPs presume valid indications, reports or conditions as explained in the classification description and instructions section. Valid is a fundamental instruction for classification, not a threshold criterion. Removed the words 'reading' and 'indicate' for human factors considerations (minimize extraneous words). RU1.2 specifies the ODCM limit as the high alarm is set at a fraction of the ODCM. NEI AA1.4 is N/A for BBNPP because the site is not equipped with a perimeter radiation monitoring system. NEI AA1.5 is N/A for BBNPP because the site is not equipped with an automatic real-time dose assessment system. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
<u>AU1</u> **Initiating Condition - NOTIF OF UNUSUAL EVENT** Any release of gaseous or liquid radioactivity to the environment greater than 2 times the Radiological Effluent Technical Specifications/ODCM for 60 minutes or longer. **Operating Mode Applicability:** All **Example Emergency Action Levels:** (1 or 2 or 3 or 4 or 5) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown. 1. VALID reading on **ANY** of the following radiation monitors greater than the reading shown for 60 minutes or longer: (site specific monitor list and threshold values) 2. VAILD reading on any effluent monitor reading greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer. 3. Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates greater than 2 times (site specific RETS values) for 60 minutes or longer. 4. VAILD reading on perimeter radiation monitoring system reading greater than 0.10 mR/hr above normal* background for 60 minutes or longer. {for sites having telemetered perimeter monitors} 5. VAILD indication on automatic real-time dose assessment capability indicating greater than (site specific value) for 60 minutes or longer. {for sites having such capability} * Normal can be considered as the highest reading in the past twenty-four hours excluding the current peak value.	<u>RU1</u> **Initiating Condition:** Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM limit for 60 minutes or longer. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** **Note:** In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown. 1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RU1.1} µCi/hr** for **60 minutes** or longer. **OR** 2. **ANY** of the following effluent monitors **> 2 times the ODCM limit** established by a current radioactivity discharge permit for **60 minutes** or longer: • Rad Waste Building Transfer Tank Discharge Line Activity Monitor ({KPK29 CR001/002}) • Discharge permit specified monitor **OR** 3. Confirmed sample analysis for gaseous or liquid releases **> 2 times the ODCM limit** for **60 minutes** or longer.	<u>Differences</u> The first note sentence has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. Removed 'VALID'. All EALs and FBPs presume valid indications, reports or conditions as explained in the classification description and instructions section. Valid is a fundamental instruction for classification, not a threshold criterion. Removed the words 'reading' and 'indicate' for human factors considerations (minimize extraneous words). RU1.2 specifies the ODCM limit as the high alarm is set at a fraction of the ODCM. NEI AU1.4 is N/A for BBNPP because the site is not equipped with a perimeter radiation monitoring system. NEI AU1.5 is N/A for BBNPP because the site is not equipped with an automatic real-time dose assessment system. <u>Deviations</u> None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
AU2 **Initiating Condition - ALERT** Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the reactor vessel. **Operating Mode Applicability**: All **Example Emergency Action Levels**: (1 or 2) 1. A water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal that will result in irradiated fuel becoming uncovered. 2. A VALID alarm or (site specific elevated reading) on **ANY** of the following due to damage to irradiated fuel or loss of water level. (site specific radiation monitors)	**RA2** **Initiating Condition:** Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the reactor vessel. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. A water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal that will result in irradiated fuel becoming uncovered. **OR** 2. **>1000 mR/hr** on **ANY** of the following due to damage to irradiated fuel or loss of water level: • Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) • Fuel Building Spent Fuel Mast Bridge Dose Rate Monitor ({JYK28 CR002}) • Fuel Building Fuel Pool Dose Rate Monitor ({JYK28 CR001}) • Transfer Pit Dose Rate Monitor ({JYK23 CR001})	**Differences** Removed 'VALID'. All EALs and FBPs presume valid indications, reports or conditions as explained in the classification description and instructions section. Valid is a fundamental instruction for classification, not a threshold criterion. **Deviations** None
AU2 **Initiating Condition - NOTIF OF UNUSUAL EVENT** UNPLANNED rise in plant radiation levels. **Operating Mode Applicability**: All **Example Emergency Action Levels**: (1 or 2) 1. a. UNPLANNED water level drop in a reactor refueling pathway as indicated by (site specific level or indication). **AND** b. VALID Area Radiation Monitor reading rise on (site specific list). 2. UNPLANNED VALID Area Radiation Monitor readings or survey results indicate a rise by a factor of 1000 over normal* levels. *Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value.	**RU2** **Initiating Condition:** UNPLANNED rise in plant radiation levels. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. a. UNPLANNED water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal as indicated by **ANY** of the following: • Reactor refueling cavity level ({FAK31 CL003 or CL004}) **< {RU2.1.a(b1)} feet**. • Spent fuel pool level ({FAL18 CL001}) **< {RU2.1.a(b2)} feet**. • Fuel transfer canal level ({FAL18 CL004 or CL005}) **< {RU2.1.a(b3)} feet**. • Report of visual observation. **AND** b. Area radiation monitor rise on **ANY** of the following: • Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) • Fuel Building Spent Fuel Mast Bridge Dose Rate Monitor ({JYK28 CR002}) • Fuel Building Fuel Pool Dose Rate Monitor ({JYK28 CR001}) • Transfer Pit Dose Rate Monitor ({JYK23 CR001}) **OR** 2. UNPLANNED area radiation monitor or radiation survey > **1000 times NORMAL LEVELS**.	**Differences** Specified components of 'reactor refueling pathway' to be consistent with RA2 (AA2). Created NORMAL LEVELS as a defined term for consistency within the scheme. Removed 'VALID'. All EALs and FBPs presume valid indications, reports or conditions as explained in the classification description and instructions section. Valid is a fundamental instruction for classification, not a threshold criterion. Removed the words 'reading' and 'indicate' for human factors considerations (minimize extraneous words). **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
AA3 **Initiating Condition - ALERT** Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions. **Operating Mode Applicability**: All **Example Emergency Action Levels**: (1 or 2) 1. Dose rate greater than 15 mR/hr in **ANY** of the following areas requiring continuous occupancy to maintain plant safety functions: (site specific area list)	**RA3** **Initiating Condition:** Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. Dose rate **> 15 mR/hr** in **ANY** of the following areas requiring continuous occupancy to maintain plant safety functions: • Control Room • Central Alarm Station	**Differences** None **Deviations** None
Hazards and Other Conditions Affecting Plant Safety		
HG1 **Initiating Condition - GENERAL EMERGENCY** HOSTILE ACTION resulting in loss of physical control of the facility. **Operating Mode Applicability:** All **Example Emergency Action Level:** (1 or 2) 1. A HOSTILE ACTION has occurred such that plant personnel are unable to operate equipment required to maintain safety functions. 2. A HOSTILE ACTION has caused failure of Spent Fuel Cooling Systems and IMMINENT fuel damage is likely for a freshly off-loaded reactor core in pool.	**HG1** **Initiating Condition:** HOSTILE ACTION resulting in loss of physical control of the facility. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. A HOSTILE ACTION has occurred such that plant personnel are unable to operate equipment required to maintain safety functions. **OR** 2. A HOSTILE ACTION has caused failure of spent fuel cooling systems and IMMINENT fuel damage is likely.	**Differences** Removed 'for a freshly off-loaded reactor core in pool' to eliminate unnecessary complication. Operators do not track days since offload in the control Room and imminent damage will apply to any type of fuel in the pool. **Deviations** None
HS4 **Initiating Condition - SITE AREA EMERGENCY** HOSTILE ACTION within the PROTECTED AREA. **Operating Mode Applicability:** All **Example Emergency Action Level:** 1. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the (site security shift supervision).	**HS1** **Initiating Condition:** HOSTILE ACTION within the PROTECTED AREA. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Shift Supervisor.	**Differences** None **Deviations** None
HA4 **Initiating Condition - ALERT** HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat. **Operating Mode Applicability:** All **Example Emergency Action Level:** (1 or 2) 1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLED AREA as reported by the (site specific security shift supervision). 2. A validated notification from NRC of an airliner attack threat within 30 minutes of the site.	**HA1** **Initiating Condition:** HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the Security Shift Supervisor. **OR** 2. A validated notification from the NRC of a LARGE AIRCRAFT attack threat within **30 minutes** of the site.	**Differences** Changed airliner to large aircraft. Using large aircraft includes non-airline owned large aircraft and is therefore more comprehensive and appropriate, while maintaining the meaning and intent. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
HU4 **Initiating Condition – NOTIF OF UNUSUAL EVENT** Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant. **Operating Mode Applicability:** All **Example Emergency Action Levels:** (1 or 2 or 3) 1. A SECURITY CONDITION that does NOT involve a HOSTILE ACTION as reported by the (site specific security shift supervision). 2. A credible site specific security threat notification. 3. A validated notification from NRC providing information of an aircraft threat.	**HU1** **Initiating Condition:** Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the Security Shift Supervisor. **OR** 2. A credible site specific security threat notification. **OR** 3. A validated notification from the NRC providing information of an aircraft threat.	**Differences** None **Deviations** None
HS2 **Initiating Condition - SITE AREA EMERGENCY** Control room evacuation has been initiated and plant control cannot be established. **Operating Mode Applicability:** All **Example Emergency Action Level:** 1. a. Control room evacuation has been initiated. **AND** b. Control of the plant cannot be established within (site specific minutes).	**HS2** **Initiating Condition:** Control Room evacuation has been initiated and plant control cannot be established. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. a. Control Room evacuation has been initiated. **AND** b. Control of the plant cannot be established within **15 minutes**.	**Differences** None **Deviations** None
HA5 **Initiating Condition - ALERT** Control room evacuation has been initiated. **Operating Mode Applicability:** All **Example Emergency Action Level:** 1. (Site-specific procedure) requires control room evacuation.	**HA2** **Initiating Condition:** Control Room evacuation has been initiated. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. Control Room evacuation has been initiated.	**Differences** Reworded EAL to be consistent with IC and to eliminate the need to rely on a procedure reference as a threshold (human factors). This does not change the meaning or intent. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
<u>**HA1**</u> **Initiating Condition - ALERT** Natural or destructive phenomena affecting VITAL AREAS. **Operating Mode Applicability:** All **Example EALs:** (1 or 2 or 3 or 4 or 5 or 6) 1. a. Seismic event greater than Operating Basis Earthquake (OBE) as indicated by (site specific seismic instrumentation) reading (site-specific OBE limit). **AND** b. Earthquake confirmed by **ANY** of the following: • Earthquake felt in plant • National Earthquake Center • Control Room indication of degraded performance of systems required for the safe shutdown of the plant. 2. Tornado striking or high winds greater than (site specific mph) resulting in VISIBLE DAMAGE to **ANY** of the following structures containing safety systems or components **OR** control room indication of degraded performance of those safety systems: (site specific structure list) 3. Internal flooding in **ANY** of the following areas resulting in an electrical shock hazard that precludes access to operate or monitor safety equipment **OR** control room indication of degraded performance of those safety systems: (site specific area list) 4. Turbine failure-generated PROJECTILES resulting in VISIBLE DAMAGE to or penetration of **ANY** of the following structures containing safety systems or components **OR** control room indication of degraded performance of those safety systems: (site specific structure list) 5. Vehicle crash resulting in VISIBLE DAMAGE to **ANY** of the following structures containing safety systems or components **OR** control room indication of degraded performance of those safety systems: (site specific structure list) 6. (Site specific occurrences) resulting in VISIBLE DAMAGE to **ANY** of the following structures containing safety systems or components **OR** control room indication of degraded performance of those safety systems: (site specific structure list)	<u>**HA3**</u> **Initiating Condition:** Natural or destructive phenomena affecting VITAL AREAS. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. a. Seismic event **> OBE** as indicated by PICS seismic monitoring system. **AND** b. Earthquake confirmed by **ANY** of the following: • Earthquake felt in plant • National Earthquake Center • Control Room indication of degraded performance of systems required for the safe shutdown of the plant. **OR** 2. Tornado or high winds **> {100 mph (45 m/s)}** resulting in **EITHER** of the following: • VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components. • Control Room indication of degraded performance of those safety systems. **OR** 3. Internal flooding in **Table H-1** areas resulting in **EITHER** of the following: • Electrical shock hazard that precludes access to operate or monitor safety equipment. • Control Room indication of degraded performance of those safety systems. **OR** 4. Turbine failure-generated PROJECTILES resulting in **EITHER** of the following: • VISIBLE DAMAGE to or penetration of **ANY** structures in **Table H-1** areas containing safety systems or components. • Control Room indication of degraded performance of those safety systems. **OR** 5. Vehicle crash resulting in **EITHER** of the following: • VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components. • Control Room indication of degraded performance of those safety systems.	<u>**Note:**</u> Changes to the nesting format of EALs HA3.2-6 are considered administrative. <u>**Differences**</u> Removed HA3.2 tornado 'striking' as it is irrelevant whether it strikes or not if it causes visible damage to structures containing safety systems or components. <u>**Deviations**</u> None <u>**Table**</u> **Table H-1: Safe Shutdown Vital Areas** • Control Room • Safeguards Buildings • Containment • Nuclear Auxiliary Building • Emergency Power Generating Buildings • ESW Cooling Towers

<table>
<tr><th>NEI 99-01 Rev. 5</th><th>New EALs</th><th>Difference or Deviation</th></tr>
<tr>
<td>
<u>HU1</u>
Initiating Condition - NOTIF OF UNUSUAL EVENT
Natural or destructive phenomena affecting the PROTECTED AREA.
Operating Mode Applicability: All
Example Emergency Action Level: (1 or 2 or 3 or 4 or 5)
1. Seismic event identified by ANY 2 of the following:
• Seismic event confirmed by (site-specific indication or method)
• Earthquake felt in plant
• National Earthquake Center
2. Tornado striking within the PROTECTED AREA or high winds greater than (site-specific mph).
3. Internal flooding that has the potential to affect safety related equipment required by Technical Specifications for the current operating mode in ANY of the following areas:
(site specific area list)
4. Turbine failure resulting in casing penetration or damage to turbine or generator seals
5. (Site specific occurrences affecting PROTECTED AREA).
</td>
<td>
<u>HU3</u>
Initiating Condition:
Natural or destructive phenomena affecting the PROTECTED AREA.
Operating Mode Applicability: 1, 2, 3, 4, 5, 6, D
EALs:
1. a. Seismic event trigger as indicated by PICS seismic monitoring system.
AND
b. Earthquake confirmed by EITHER of the following:
• Earthquake felt in plant
• National Earthquake Center
OR
2. a. Tornado within the PROTECTED AREA.
OR
b. High winds > {100 mph (45 m/s)}.
OR
3. Internal flooding in Table H-1 areas that has the potential to affect safety related equipment required by Technical Specifications for the current operating mode.
OR
4. Turbine failure resulting in casing penetration or damage to turbine or generator seals.
Table H-1: Safe Shutdown Vital Areas
• Control Room
• Safeguards Buildings
• Containment
• Nuclear Auxiliary Building
• Emergency Power Generating Buildings
• ESW Cooling Towers
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<u>Note:</u> Changes to the nesting format of EAL HU3.2 is considered administrative.
<u>Differences</u>
Nested HU3.1 to match HA3.1. U.S. EPR is capable of measuring ground motion at the UE level.
Removed HU3.2 tornado ‘striking’ as it is irrelevant whether it strikes within the protected area if the tornado itself is within the protected area.
<u>Deviations</u>
None
</td>
</tr>
</table>

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
HU2 **Initiating Condition - ALERT** FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown. **Operating Mode Applicability:** All **Example Emergency Action Level:** 1. FIRE or EXPLOSION resulting in VISIBLE DAMAGE to **ANY** of the following structures containing safety systems or components **OR** control room indication of degraded performance of those safety systems: (site specific structure list)	**HA4** **Initiating Condition:** FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. FIRE or EXPLOSION resulting in **EITHER** of the following: • VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components. • Control Room indication of degraded performance of those safety systems. **Table H-1: Safe Shutdown Vital Areas** • Control Room • Safeguards Buildings • Containment • Nuclear Auxiliary Building • Emergency Power Generating Buildings • ESW Cooling Towers	**Note:** Changes to the nesting format of EAL HA4.1 is considered administrative. **Differences** None **Deviations** None
HU2 **Initiating Condition - NOTIF OF UNUSUAL EVENT** FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA. **Operating Mode Applicability:** All **Example Emergency Action Level:** (1 or 2) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the duration has exceeded, or will likely exceed, the applicable time. 1. FIRE not extinguished within 15 minutes of control room notification or verification of a control room FIRE alarm in **ANY** of the following areas: (site specific area list) 2. EXPLOSION within the PROTECTED AREA.	**HU4** **Initiating Condition:** FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. FIRE not extinguished within **15 minutes** of Control Room notification or verification of a Control Room FIRE alarm in actual contact with or immediately adjacent to **ANY** of the **Table H-1** areas. **Table H-1: Safe Shutdown Vital Areas** • Control Room • Safeguards Buildings • Containment • Nuclear Auxiliary Building • Emergency Power Generating Buildings • ESW Cooling Towers **OR** 2. EXPLOSION within the PROTECTED AREA.	**Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. Added 'in actual contact with or immediately adjacent to' from the basis section to HU4.1 to support the use of table H-1. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
<u>HA3</u> **Initiating Condition - ALERT** Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of operating equipment required to maintain safe operations or safely shutdown the reactor. **Operating Mode Applicability:** All **Example Emergency Action Levels:** Note: If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event. 1. Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of systems required to maintain safe operations or safely shutdown the reactor.	<u>HA5</u> **Initiating Condition:** Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize the ability to safely operate or shutdown the reactor. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** **Note:** If the equipment in the VITAL AREA was inoperable or out of service before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability to safely operate or shutdown the plant beyond that allowed by Technical Specifications at the time of the event. 1. Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize the ability to safely operate or shutdown the reactor.	<u>**Differences**</u> Reworded IC, note and EAL for readability. <u>**Deviations**</u> None
<u>HU3</u> **Initiating Condition – NOTIF OF UNUSUAL EVENT** Release of toxic, corrosive, asphyxiant or flammable gases deemed detrimental to NORMAL PLANT OPERATIONS. **Operating Mode Applicability:** All **Example Emergency Action Levels:** (1 or 2) 1. Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect NORMAL PLANT OPERATIONS. 2. Report by local, county or state officials for evacuation or sheltering of site personnel based on an off-site event.	<u>HU5</u> **Initiating Condition:** Release of toxic, corrosive, asphyxiant or flammable gases deemed detrimental to NORMAL PLANT OPERATIONS. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect NORMAL PLANT OPERATIONS. **OR** 2. Report by local, county or state officials for evacuation or sheltering of site personnel based on an offsite event.	<u>**Differences**</u> None <u>**Deviations**</u> None
<u>HG2</u> **Initiating Condition - GENERAL EMERGENCY** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a General Emergency. **Operating Mode Applicability:** All **Example Emergency Action Level:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area.	<u>HG6</u> **Initiating Condition:** Other conditions exist which in the judgment of the Emergency Director warrant declaration of General Emergency. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	<u>**Differences**</u> None <u>**Deviations**</u> None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
HS3 **Initiating Condition - SITE AREA EMERGENCY** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a Site Area Emergency. **Operating Mode Applicability:** All **Example Emergency Action Level:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.	**HS6** **Initiating Condition:** Other conditions exist which in the judgment of the Emergency Director warrant declaration of Site Area Emergency. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.	**Differences** None **Deviations** None
HA6 **Initiating Condition - ALERT** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert. **Operating Mode Applicability:** All **Example Emergency Action Level:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	**HA6** **Initiating Condition:** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	**Differences** None **Deviations** None
HU5 **Initiating Condition – NOTIF OF UNUSUAL EVENT** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a NOUE. **Operating Mode Applicability:** All **Example Emergency Action Level:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress 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.	**HU6** **Initiating Condition:** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Unusual Event. **Operating Mode Applicability:** 1, 2, 3, 4, 5, 6, D **EALs:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress 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 offsite response or monitoring are expected unless further degradation of safety systems occurs.	**Differences** None **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
System Malfunctions - Hot		
<u>SG1</u> **Initiating Condition - GENERAL EMERGENCY** Prolonged loss of all Off-site and all On-Site AC power to emergency busses. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** 1. a. Loss of all off-site and on-site AC power to (site specific emergency busses). **AND** b. **EITHER** of the following: • Restoration of at least one emergency bus in less than (site specific hours) is not likely. • (Site specific Indication of continuing degradation of core cooling based on Fission Product Barrier monitoring.)	**<u>SG1</u>** **Initiating Condition:** Prolonged loss of all offsite and all onsite AC power to emergency busses. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. a. Loss of **ALL** offsite and **ALL** onsite AC power to 31, 32, 33 and 34 BDA busses. **AND** b. **EITHER** of the following: • Restoration of at least one emergency bus within **2 hours** is not likely. • **{**Calculated Clad Temperature in **Region 4}**.	**<u>Differences</u>** None **<u>Deviations</u>** None
<u>SS1</u> **Initiating Condition - SITE AREA EMERGENCY** Loss of all Off-site and all On-Site AC power to emergency busses for 15 minutes or longer. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. Loss of all Off-Site and all On-Site AC power to (site specific emergency busses) for 15 minutes or longer.	**<u>SS1</u>** **Initiating Condition:** Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. Loss of **ALL** offsite and **ALL** onsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.	**<u>Differences</u>** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **<u>Deviations</u>** None
<u>SA5</u> **Initiating Condition - ALERT** AC power capability to emergency busses reduced to a single power source for 15 minutes or longer such that any additional single failure would result in station blackout. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. a. AC power capability to (site-specific emergency busses) reduced to a single power source for 15 minutes or longer. **AND** b. Any additional single failure will result in station blackout.	**<u>SA1</u>** **Initiating Condition:** AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. a. AC power to 31, 32, 33 and 34 BDA busses is reduced to a single source for **15 minutes** or longer. **AND** b. Any additional single failure will result in a loss of all AC power to 31, 32, 33 and 34 BDA busses.	**<u>Differences</u>** Replaced station blackout with a loss of all AC to emergency busses. The additional loss to emergency bus may not result in a station blackout on U.S. EPR if power is being backfed to non-vital busses. Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **<u>Deviations</u>** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
SU1 **Initiating Condition - NOTIF OF UNUSUAL EVENT** Loss of all Off-site AC power to emergency busses for 15 minutes or longer. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. Loss of all off-site AC power to (site specific emergency busses) for 15 minutes or longer.	**SU1** **Initiating Condition:** Loss of all offsite AC power to emergency busses for 15 minutes or longer. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. Loss of **ALL** offsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.	**Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **Deviations** None
SS3 **Initiating Condition - SITE AREA EMERGENCY** Loss of all vital DC power for 15 minutes or longer. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. Less than (site specific bus voltage indication) on all (site specific Vital DC busses) for 15 minutes or longer.	**SS2** **Initiating Condition:** Loss of required DC power for 15 minutes or longer. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. **< 210 VDC** on the required 31, 32, 33 and 34 BUC busses for **15 minutes** or longer.	**Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **Deviations** None
SG2 **Initiating Condition - GENERAL EMERGENCY** Automatic Scram (Trip) and all manual actions fail to shutdown the reactor and indication of an extreme challenge to the ability to cool the core exists. **Operating Mode Applicability:** Power Operation, Startup **Example Emergency Action Level:** 1. a. An automatic scram (trip) failed to shutdown the reactor. **AND** b. All manual actions do not shutdown the reactor as indicated by (site specific indications of reactor not shutdown). **AND** c. **EITHER** of the following exist or have occurred due to continued power generation: • (Site specific indication that core cooling is extremely challenged.) • (Site specific indication that heat removal is extremely challenged.)	**SG3** **Initiating Condition:** Automatic trip and all manual actions failed to shutdown the reactor and indication of an extreme challenge to the ability to cool the core exists. **Operating Mode Applicability:** 1, 2 **EALs:** 1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**. **AND** b. All manual actions failed to shutdown the reactor as indicated by reactor power **> 5%**. **AND** c. **EITHER** of the following have occurred: • **{**Calculated Clad Temperature **in Region 3 or higher}**. • Loss of all four trains of Emergency Feedwater.	**Differences** Added reactor power threshold to SG3.1.a to provide consistent wording throughout the escalation pathway. Reworded SG3.1.b from 'do not shutdown' to 'failed to shutdown' to match IC and SG3.1.a wording (human factors). This does not change the meaning or intent. Removed the SG3.1.c words 'exist or' for human factors considerations (minimize extraneous words). Removed the SG3.1.c words 'due to continued power generation' since continued power generation will not cause a loss of all four EFW trains. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
<u>SS2</u> **Initiating Condition - SITE AREA EMERGENCY** Automatic Scram (Trip) fails to shutdown the reactor and manual actions taken from the reactor control console are not successful in shutting down the reactor. **Operating Mode Applicability:** Power Operation, Startup **Example Emergency Action Level:** 1. a. An automatic scram (trip) failed to shutdown the reactor. **AND** b. Manual actions taken at the reactor control console do not shutdown the reactor as indicated by (site specific indications of reactor not shutdown).	**<u>SS3</u>** **Initiating Condition:** Automatic trip failed to shutdown the reactor and manual actions taken from the reactor control console failed to shutdown the reactor. **Operating Mode Applicability:** 1, 2 **EALs:** 1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**. **AND** b. Manual actions taken at the reactor control console failed to shutdown the reactor as indicated by reactor power **> 5%**.	**<u>Differences</u>** Added reactor power threshold to SS3.1.a to provide consistent wording throughout the escalation pathway. Reworded IC and SS3.1.b from 'do not shutdown' to 'failed to shutdown' to match SG3 IC and SS3.1.a wording (human factors). This does not change the meaning or intent. **<u>Deviations</u>** None
<u>SA2</u> **Initiating Condition - ALERT** Automatic Scram (Trip) fails to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor. **Operating Mode Applicability:** Power Operation, Startup **Example Emergency Action Level:** 1. a. An automatic scram (trip) failed to shutdown the reactor. **AND** b. Manual actions taken at the reactor control console successfully shutdown the reactor as indicated by (site specific indications of plant shutdown).	**<u>SA3</u>** **Initiating Condition:** Automatic trip failed to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor. **Operating Mode Applicability:** 1, 2 **EALs:** 1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**. **AND** b. Manual actions taken at the reactor control console successfully shutdown the reactor as indicated by reactor power **< 5%**.	**<u>Differences</u>** Added reactor power threshold to SA3.1.a to provide consistent wording throughout the escalation pathway. **<u>Deviations</u>** None
<u>SU8</u> **Initiating Condition - NOTIF OF UNUSUAL EVENT** Inadvertent Criticality. **OPERATING MODE APPLICABILITY:** Hot Standby, Hot Shutdown **Example Emergency Action Level:** 1. UNPLANNED sustained positive period observed on nuclear instrumentation. {*BWR*} 1. UNPLANNED sustained positive startup rate observed on nuclear instrumentation. {*PWR*}	**<u>SU3</u>** **Initiating Condition:** Inadvertent criticality. **Operating Mode Applicability:** 3, 4 **EALs:** 1. UNPLANNED sustained positive startup rate observed on nuclear instrumentation.	**<u>Differences</u>** None **<u>Deviations</u>** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
SS6 **Initiating Condition - SITE AREA EMERGENCY** Inability to monitor a SIGNIFICANT TRANSIENT in progress. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. a. Loss of greater than approximately 75% of the following for 15 minutes or longer: • (Site specific control room safety system annunciation) **OR** • (Site specific control room safety system indication) **AND** b. A SIGNIFICANT TRANSIENT is in progress. **AND** c. Compensatory indications are unavailable.	**SS4** **Initiating Condition:** Loss of all monitoring functions for 15 minutes or longer with a SIGNIFICANT TRANSIENT in progress. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. a. Loss of SICS for **15 minutes** or longer. **AND** b. Loss of PICS for **15 minutes** or longer. **AND** c. **ANY** of the following SIGNIFICANT TRANSIENTS are in progress: • Automatic runback **> 50%** thermal power • Electrical load rejection **> 50%** full electrical load • Reactor trip • MHSI actuation	**Differences** Reworded IC to reflect EAL conditions and provide logical intuitive progression pathway. Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **Deviations (Deviation #2)** Loss of greater than approximately 75% removed to account for U.S. EPR digital monitoring system design. Compensatory indication criterion was removed. Compensatory indication is not applicable U.S. EPR.
SA4 **Initiating Condition - ALERT** UNPLANNED Loss of safety system annunciation or indication in the Control Room with EITHER (1) a SIGNIFICANT TRANSIENT in progress, or (2) compensatory indicators unavailable. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. a. UNPLANNED loss of greater than approximately 75% of the following for 15 minutes or longer: • (Site specific control room safety system annunciation) • (Site specific control room safety system indication) b. **EITHER** of the following: • A SIGNIFICANT TRANSIENT is in progress. • Compensatory indications are unavailable.	**SA4** **Initiating Condition:** Loss of all monitoring functions for 15 minutes or longer. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. a. Loss of SICS for **15 minutes** or longer. **AND** b. Loss of PICS for **15 minutes** or longer.	**Differences** Reworded IC to reflect EAL conditions and provide logical intuitive progression pathway. Removed the unplanned restriction from the IC and EAL since U.S. EPR operations do not allow for the removal of SICS or PICS while in the hot modes. Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **Deviations (Deviation #2)** Loss of greater than approximately 75% removed to account for U.S. EPR digital monitoring system design. Compensatory indication criterion was removed. Compensatory indication is not applicable U.S. EPR. Removed significant transient to provide progression to SAE EAL.

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
SU3 **Initiating Condition - NOTIF OF UNUSUAL EVENT** UNPLANNED loss of safety system annunciation or indication in the control room for 15 minutes or longer. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. UNPLANNED loss of greater than approximately 75% of the following for 15 minutes or longer: a. (Site specific control room safety system annunciation) **OR** b. (Site specific control room safety system indication)	**SU4** **Initiating Condition:** Degradation of monitoring functions for 15 minutes or longer. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. Loss of SICS for **15 minutes** or longer. **OR** 2. Loss of PICS for **15 minutes** or longer.	**Differences** Reworded IC to reflect EAL conditions and provide logical intuitive progression pathway. Removed the unplanned restriction from the IC and EAL since U.S. EPR operations do not allow for the removal of SICS or PICS while in the hot modes. Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **Deviations (Deviation #2)** Loss of greater than approximately 75% removed to account for U.S. EPR digital monitoring system design.
SU2 **Initiating Condition - NOTIF OF UNUSUAL EVENT** Inability to reach required shutdown within Technical Specification limits. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Level:** 1. Plant is not brought to required operating mode within Technical Specifications LCO Action Statement Time.	**SU5** **Initiating Condition:** Inability to reach required operating mode within Technical Specification limits. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. Plant is not brought to required operating mode within Technical Specifications LCO action completion time.	**Differences** Replaced 'shutdown' with 'operating mode' in the IC to more accurately reflect the EAL wording and the intent of the bases. **Deviations** None
SU6 **Initiating Condition - NOTIF OF UNUSUAL EVENT** Loss of all On-site or Off-site communications capabilities. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Levels:** (1 or 2) 1. Loss of all of the following on-site communication methods affecting the ability to perform routine operations. (site specific list of communications methods) 2. Loss of all of the following off-site communication methods affecting the ability to perform offsite notifications. (site specific list of communications methods)	**SU6** **Initiating Condition:** Loss of all onsite or offsite communications capabilities. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. Loss of **ALL** of the following onsite communication methods affecting the ability to perform routine operations: • {Radios} • {Plant Page} • {Internal Telephone Systems} **OR** 2. Loss of **ALL** of the following offsite communications methods affecting the ability to perform offsite notifications: • {Dedicated Offsite Conference Lines} • {Telecopy Transmittal} • NRC Emergency Notification System - ENS • NRC Health Physics Network - HPN • {External Telephone Systems}	**Differences** None **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
SU5 **Initiating Condition - NOTIF OF UNUSUAL EVENT** RCS leakage. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Levels:** (1 or 2) 1. Unidentified or pressure boundary leakage greater than 10 gpm. 2. Identified leakage greater than 25 gpm.	**SU7** **Initiating Condition:** RCS leakage. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. Unidentified or pressure boundary leakage **> 10 gpm**. **OR** 2. Identified leakage **> 25 gpm**.	**Differences** None **Deviations** None
SU4 **Initiating Condition - NOTIF OF UNUSUAL EVENT** Fuel Clad degradation. **Operating Mode Applicability:** Power Operation, Startup, Hot Standby, Hot Shutdown **Example Emergency Action Levels:** (1 or 2) 1. (Site specific radiation monitor readings indicating fuel clad degradation greater than Technical Specification allowable limits.) 2. (Site specific coolant sample activity value indicating fuel clad degradation greater than Technical Specification allowable limits.)	**SU9** **Initiating Condition:** Fuel clad degradation. **Operating Mode Applicability:** 1, 2, 3, 4 **EALs:** 1. Gross Failed Fuel Monitor ({KUA66 CR001}) **> {SU9.1} cpm**. **OR** 2. Coolant sample activity **> 1.0 µCi/gm** dose equivalent I-131.	**Differences** None **Deviations** None
System Malfunctions - Cold		
CA3 **Initiating Condition - ALERT** Loss of all Off-site and all On-Site AC power to emergency busses for 15 minutes or longer. **Operating Mode Applicability:** Cold Shutdown, Refueling, Defueled **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. 1. Loss of all Off-Site and On-Site AC Power to (site specific emergency busses) for 15 minutes or longer.	**CA1** **Initiating Condition:** Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer. **Operating Mode Applicability:** 5, 6, D **EALs:** 1. Loss of **ALL** offsite and **ALL** onsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.	**Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
<u>CU3</u> **Initiating Condition - NOTIF OF UNUSUAL EVENT** AC power capability to emergency busses reduced to a single power source for 15 minutes or longer such that any additional single failure would result in station blackout **Operating Mode Applicability:** Cold Shutdown, Refueling **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. 1. a. AC power capability to (site specific emergency busses) reduced to a single power source for 15 minutes or longer. **AND** b. Any additional single power source failure will result in station blackout.	<u>CU1</u> **Initiating Condition:** AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses. **Operating Mode Applicability:** 5, 6 **EALs:** 1. a. AC power to 31, 32, 33 and 34 BDA busses is reduced to a single source for **15 minutes** or longer. **AND** b. Any additional single failure will result in a loss of all AC power to 31, 32, 33 and 34 BDA busses.	<u>**Differences**</u> Replaced station blackout with a loss of all AC to emergency busses. The additional loss to emergency bus may not result in a station blackout on U.S. EPR if power is being backfed to non-vital busses. Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. <u>**Deviations**</u> None
<u>CU7</u> **Initiating Condition - NOTIF OF UNUSUAL EVENT** Loss of required DC power for 15 minutes or longer. **Operating Mode Applicability:** Cold Shutdown, Refueling **Example Emergency Action Level:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. 1. Less than (site specific bus voltage indication) on required (site specific Vital DC busses) for 15 minutes or longer.	<u>CU2</u> **Initiating Condition:** Loss of required DC power for 15 minutes or longer. **Operating Mode Applicability:** 5, 6 **EALs:** 1. **< 210 VDC** on the required 31, 32, 33 and 34 BUC busses for **15 minutes** or longer.	<u>**Differences**</u> Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. <u>**Deviations**</u> None
<u>CU8</u> **Initiating Condition - NOTIF OF UNUSUAL EVENT** Inadvertent criticality. **Operating Mode Applicability:** Cold Shutdown, Refueling **Example Emergency Action Levels:** 1. UNPLANNED sustained positive period observed on nuclear instrumentation. (BWR) 1. UNPLANNED sustained positive startup rate observed on nuclear instrumentation. (PWR)	<u>CU3</u> **Initiating Condition:** Inadvertent criticality. **Operating Mode Applicability:** 5, 6 **EALs:** 1. UNPLANNED sustained positive startup rate observed on nuclear instrumentation.	<u>**Differences**</u> None <u>**Deviations**</u> None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
<u>CU6</u> **Initiating Condition - NOTIF OF UNUSUAL EVENT** Loss of all On-site or Off-site communications capabilities. **Operating Mode Applicability:** Cold Shutdown, Refueling, Defueled **Example Emergency Action Levels:** (1 or 2) 1. Loss of all of the following on-site communication methods affecting the ability to perform routine operations. (site specific list of communications methods) 2. Loss of all of the following off-site communication methods affecting the ability to perform offsite notifications. (site specific list of communications methods)	**<u>CU6</u>** **Initiating Condition:** Loss of all onsite or offsite communications capabilities. **Operating Mode Applicability:** 5, 6, D **EALs:** 1. Loss of **ALL** of the following onsite communication methods affecting the ability to perform routine operations: • {Radios} • {Plant Page} • {Internal Telephone Systems} **OR** 2. Loss of **ALL** of the following offsite communications methods affecting the ability to perform offsite notifications: • {Dedicated Offsite Conference Lines} • {Telecopy Transmittal} • NRC Emergency Notification System - ENS • NRC Health Physics Network - HPN • {External Telephone Systems}	**<u>Differences</u>** None **<u>Deviations</u>** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
CG1 **Initiating Condition - GENERAL EMERGENCY** Loss of RCS/RPV inventory affecting fuel clad integrity with containment challenged. **Operating Mode Applicability:** Cold Shutdown, Refueling **Example Emergency Action Level:** (1 or 2) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. 1. a. RCS/RPV level less than (site specific level for TOAF) for 30 minutes or longer. **AND** b. **ANY** containment challenge indication (see Table): 2. a. RCS/RPV level cannot be monitored with core uncovery indicated by **ANY** of the following for 30 minutes or longer. • (Site specific radiation monitor) reading greater than (site specific setpoint). • Erratic source range monitor indication. • UNPLANNED level rise in (site specific sump or tank). • {*Other site specific indications*} **AND** b. **ANY** containment challenge indication (see Table): **Table: Containment Challenge Indications** • CONTAINMENT CLOSURE not established. • (Site specific explosive mixture) inside containment. • UNPLANNED rise in containment pressure. • Secondary containment radiation monitor reading above (site specific value). {*BWR only*}	**CG7** **Initiating Condition:** Loss of RPV inventory affecting fuel clad integrity with containment challenged. **Operating Mode Applicability:** 5, 6 **EALs:** 1. a. RPV level **< {96.0 feet (29.3 meters)}** (top of active fuel) for **30 minutes** or longer. **AND** b. **ANY Table C-1** containment challenge indications. **OR** 2. a. RPV level cannot be monitored with core uncovery indicated by **ANY** of the following for **30 minutes** or longer: • Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) **> {CG7.2.a(b1)} mR/hr**. • Erratic source range monitor indication. • UNPLANNED level rise in IRWST. **AND** b. **ANY Table C-1** containment challenge indications. **Table C-1: Containment Challenge Indications** • CONTAINMENT CLOSURE not established. • Hydrogen concentration > 4% inside containment. • UNPLANNED rise in containment pressure.	**Note:** Changes to the nesting format of EAL CG7.2.a is considered administrative. **Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. Removed the word 'reading' CG7.2.a bullet 1 (NEI CG1.2.a bullet 1) for human factors considerations (minimize extraneous words). **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
CS1 **Initiating Condition - SITE AREA EMERGENCY** Loss of RCS/RPV inventory affecting core decay heat removal capability. **Operating Mode Applicability:** Cold Shutdown, Refueling **Example Emergency Action Levels:** (1 or 2 or 3) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. 1. With CONTAINMENT CLOSURE not established, RCS/RPV level less than (site specific level). {*6" below the bottom ID of the RCS loop) (PWR)*} {*6" below the low-low ECCS actuation setpoint) (BWR)*} **OR** 2. With CONTAINMENT CLOSURE established, RCS/RPV level less than (site specific level for TOAF). **OR** 3. RCS/RPV level cannot be monitored for 30 minutes or longer with a loss of RCS/RPV inventory as indicated by **ANY** of the following: • (Site specific radiation monitor) reading greater than (site specific value). • Erratic Source Range Monitor Indication. • Unexplained level rise in (site specific sump or tank).	**CS7** **Initiating Condition:** Loss of RPV inventory affecting core decay heat removal capability. **Operating Mode Applicability:** 5, 6 **EALs:** 1. a. CONTAINMENT CLOSURE not established. **AND** b. Loss of RPV inventory as indicated by RCS level ({JEF10 CL081}) **< {CS7.1.b}**. **OR** 2. a. CONTAINMENT CLOSURE established. **AND** b. RPV level **< {96.0 feet (29.3 meters)}** (top of active fuel). **OR** 3. a. RCS level cannot be monitored for **30 minutes** or longer. **AND** b. Loss of RPV inventory as indicated by **ANY** of the following: • Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) **> {CS7.3.b(b1)} mR/hr**. • Erratic source range monitor indication. • UNPLANNED level rise in IRWST.	**Note:** Changes to the nesting format of EALs CS7.1, CS7.2 and CS7.3 are considered administrative. **Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. The CS7.1 RCS level indication is the lowest accurate reading possible, but is higher than the guidance setpoint. Added wording 'Loss of RPV inventory as indicated by' to CS7.1.b to maintain consistency with CA7.1 wording in the escalation pathway. Removed the word 'reading' CS7.3.a bullet 1 (NEI CS1.3.a bullet 1) for human factors considerations (minimize extraneous words). Replace 'unexplained' with 'unplanned' to match wording of CG7.2 (NEI CG1.2) and to prevent potential confusion in the use of separate terms. **Deviations** None
CA1 **Initiating Condition - ALERT** Loss of RCS/RPV inventory. **Operating Mode Applicability:** Cold Shutdown, Refueling **Example Emergency Action Levels:** (1 or 2) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. 1. Loss of RCS/RPV inventory as indicated by level less than (site specific level). {*Low-Low ECCS actuation setpoint / Level 2 (BWR)*} {*Bottom ID of the RCS loop (PWR)*} 2. RCS/RPV level cannot be monitored for 15 minutes or longer with a loss of RCS/RPV inventory as indicated by an unexplained level rise in (site specific sump or tank).	**CA7** **Initiating Condition:** Loss of RPV inventory. **Operating Mode Applicability:** 5, 6 **EALs:** 1. Loss of RPV inventory as indicated by RCS level ({JEF10 CL081}) **< {CA7.1}**. **OR** 2. a. RCS level cannot be monitored for **15 minutes** or longer. **AND** b. Loss of RPV inventory as indicated by UNPLANNED level rise in IRWST.	**Note:** Changes to the nesting format of EAL CA7.2 is considered administrative. **Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. The CA7.1 RCS level indication is the lowest accurate reading possible, but is higher than the guidance setpoint. Replace 'unexplained' with 'unplanned' to match wording of CG7.2 (NEI CG1.2) and to prevent potential confusion in the use of separate terms. **Deviations** None

NEI 99-01 Rev. 5	New EALs	Difference or Deviation
CU1 **Initiating Condition - NOTIF OF UNUSUAL EVENT** RCS Leakage. **Operating Mode Applicability:** Cold Shutdown **Example Emergency Action Levels:** **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. 1. RCS leakage results in the inability to maintain or restore RPV level greater than (site specific low level RPS actuation setpoint) for 15 minutes or longer. {*BWR*} 1. RCS leakage results in the inability to maintain or restore level within (site specific pressurizer or RCS/RPV level target band) for 15 minutes or longer. {*PWR*}	**CU7** **Initiating Condition:** RCS leakage. **Operating Mode Applicability:** 5 **EALs:** 1. RCS leakage results in the inability to maintain or restore RCS level **> Procedure Established Minimum Level** for **15 minutes** or longer.	**Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. **Deviations** None
CU2 **Initiating Condition - NOTIF OF UNUSUAL EVENT** UNPLANNED Loss of RCS/RPV inventory. **Operating Mode Applicability:** Refueling **Example Emergency Action Levels:** (1 or 2) **Note:** The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. 1. UNPLANNED RCS/RPV level drop as indicated by either of the following: • RCS/RPV water level drop below the RPV flange for 15 minutes or longer when the RCS/RPV level band is established above the RPV flange. • RCS water level drop below the RCS level band for 15 minutes or longer when the RCS/RPV level band is already below the RPV flange. 2. RCS/RPV level cannot be monitored with a loss of RCS/RPV inventory as indicated by an unexplained level rise in (site specific sump or tank).	**CU8** **Initiating Condition:** UNPLANNED loss of RCS inventory. **Operating Mode Applicability:** 6 **EALs:** 1. a. UNPLANNED RCS level drop below the RPV flange for **15 minutes** or longer when the RCS level band is established above the RPV flange. **OR** b. UNPLANNED RCS level drop **< Procedure Established Minimum Level** for **15 minutes** or longer when the RCS level band is established below the RPV flange. **OR** 2. a. RCS level cannot be monitored. **AND** b. Loss of RPV inventory as indicated by UNPLANNED level rise in IRWST.	**Note:** Changes to the nesting format of EAL CU8 is considered administrative. **Differences** Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion. Replace 'unexplained' with 'unplanned' to match wording of CG7.2 (NEI CG1.2) and to prevent potential confusion in the use of separate terms. **Deviations** None

<table>
<tr><th>NEI 99-01 Rev. 5</th><th>New EALs</th><th>Difference or Deviation</th></tr>
<tr>
<td>
<u>CA4</u>
Initiating Condition - ALERT
Inability to maintain plant in cold shutdown.
Operating Mode Applicability: Cold Shutdown, Refueling
Example Emergency Action Levels: (EAL 1 or 2)
1. An UNPLANNED event results in RCS temperature greater than (site specific Technical Specification cold shutdown temperature limit) for greater than the specified duration on table.
<table>
<tr><th colspan="3">Table: RCS Reheat Duration Thresholds</th></tr>
<tr><th>RCS</th><th>Containment Closure</th><th>Duration</th></tr>
<tr><td>Intact (but not RCS Reduced Inventory {PWR}))</td><td>N/A</td><td>60 minutes*</td></tr>
<tr><td rowspan="2">Not Intact or RCS Reduced Inventory (PWR)</td><td>Established</td><td>20 minutes*</td></tr>
<tr><td>Not Established</td><td>0 minutes</td></tr>
</table>
* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, the EAL is not applicable.
2. An UNPLANNED event results in RCS pressure increase greater than 10 psi due to a loss of RCS cooling. (PWR-This EAL does not apply in Solid Plant conditions.)
</td>
<td>
<u>CA10</u>
Initiating Condition:
Inability to maintain plant in cold shutdown.
Operating Mode Applicability: 5, 6
EALs:
1. RCS temperature > 200° F for the specified duration on Table C-2.
<table>
<tr><th colspan="3">Table C-2: RCS Reheat Duration Thresholds</th></tr>
<tr><th>RCS</th><th>Containment Closure</th><th>Duration</th></tr>
<tr><td>Intact with Full RCS Inventory</td><td>N/A</td><td>> 60 minutes*</td></tr>
<tr><td rowspan="2">Not Intact OR Reduced RCS Inventory</td><td>Established</td><td>> 20 minutes*</td></tr>
<tr><td>Not Established</td><td>0 minutes</td></tr>
</table>
* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, this EAL is not applicable.
OR
2. RCS pressure rise > 10 psig due to a loss of RCS cooling (this EAL does not apply in solid plant conditions).
</td>
<td>
<u>Differences</u>
Removed ‘An unplanned event results in’ from CA10.1 as no planned evolutions are conducted that intentionally violate the TS cold shutdown temperature limit (irrelevant wording).
Removed ‘An unplanned event results in’ from CA10.2 as no planned event would include a loss of RCS cooling causing RCS pressure to rise > 10 psi (irrelevant wording).
Modified generic basis wording to reflect ‘intact’ terminology.
<u>Deviations</u>
None
</td>
</tr>
<tr>
<td>
<u>CU4</u>
Initiating Condition - NOTIF OF UNUSUAL EVENT
UNPLANNED loss of decay heat removal capability with irradiated fuel in the RPV.
Operating Mode Applicability: Cold Shutdown, Refueling
Example Emergency Action Levels: (1 or 2)
Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.
1. UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit.
2. Loss of all RCS temperature and RCS/RPV level indication for 15 minutes or longer.
</td>
<td>
<u>CU10</u>
Initiating Condition:
UNPLANNED loss of decay heat removal capability.
Operating Mode Applicability: 5, 6
EALs:
1. RCS temperature > 200° F due to an UNPLANNED loss of decay heat removal capability.
OR
2. Loss of ALL RCS temperature and RCS level indication for 15 minutes or longer.
</td>
<td>
<u>Differences</u>
Removed IC wording ‘with Irradiated Fuel in the RPV’ since it is redundant with mode 5 and 6 and to be consistent with the other C recognition category mode 5 and 6 ICs.
Note content has been moved to the classification description and instructions section as it is applicable to all time imbedded EALs and is a fundamental instruction for classification, not a threshold criterion.
Specified the ‘unplanned event’ as an UNPLANNED loss of decay heat removal capability to match IC wording and basis intent.
</td>
</tr>
</table>

<u>Enclosure C</u>

{Bell Bend Nuclear Power Plant}

EAL Technical Bases Manual

Emergency Classification Levels (ECLs)

Nuclear power plant emergencies are separated into four Emergency Classification Levels (ECLs): Unusual Event, Alert, Site Area Emergency, and General Emergency. The ECLs are escalated from least severe to most severe according to relative threat to the health and safety of the public and emergency workers. An ECL is determined to be met by identifying abnormal conditions and then comparing them to Initiating Conditions (ICs) through Emergency Action Levels (EAL) and Fission Product Barrier (FPB) threshold values as discussed below. When multiple EALs are met, event declaration is based in the highest ECL reached.

UNUSUAL EVENT: Events are in progress 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 offsite response or monitoring are expected unless further degradation of safety systems occurs.

ALERT: 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 EPA Protective Action Guideline exposure levels.

SITE AREA EMERGENCY: Events are in progress or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

GENERAL EMERGENCY: Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

A state or phase called RECOVERY may be entered prior to returning to a normal organization and operation. Recovery provides dedicated resources and organizational structure in support of restoration and communication activities following the termination of the emergency event.

Initiating Conditions (ICs)

The ICs provide a general description emergency conditions that are organized beneath the broader categories of the ECLs. The IC can be a continuous, measurable condition that is outside Technical Specifications, or it can encompass events such as fires or system/equipment failures.

Each IC is given a unique identification code consisting of two letters and one number. The first letter identifies the recognition category, the second letter identifies the ECL, and the number identifies the sequence of the IC within the recognition category. The EAL identification codes are developed as follows:

<u>Recognition Categories</u>

- "F" FISSION PRODUCT BARRIER DEGRADATION
- "R" RADIOLOGICAL EFFLUENT / ABNORMAL RADIATION LEVELS
- "H" HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY
- "S" SYSTEM MALFUNCTIONS - HOT
- "C" SYSTEM MALFUNCTIONS - COLD

<u>Emergency Classification Levels</u>

- “U” UNUSUAL EVENT
- “A” ALERT
- “S” SITE AREA EMERGENCY
- “G” GENERAL EMERGENCY

Emergency Action Levels (EALs) and Fission Product Barriers (FPBs)

EALs are predetermined, site specific, observable conditions below the ICs that place the state of the plant in a given ECL.

EALs are individually identified by the IC identification code followed by the EAL number, such as RG1.1 for a major effluent release or HA3.2 for high winds.

Fission Product Barriers (FPBs) are given unique three character identification codes and are further subdivided into loss and potential loss categories. Since meeting or exceeding a FPB does not necessarily result in an ECL, the first two letters simply identify the particular barrier by abbreviation. The number in the FPB identification code associates it with a particular FPB recognition category. The FPB identification codes are developed as follows:

<u>Barrier Abbreviation</u>

- "FC" FUEL CLAD
- "RC" REACTOR COOLANT
- "CT" CONTAINMENT

<u>FPB Recognition Categories</u>

- "1" CRITICAL SAFETY FUNCTION STATUS
- "2" CONTAINMENT RADIATION MONITORING
- "3" CORE TEMPERATURE
- "4" RPV LEVEL
- "5" RCS LEAK RATE
- "6" SG TUBE LEAKAGE / RUPTURE
- "7" RCS ACTIVITY
- "8" CONTAINMENT CONDITIONS
- "9" CONTAINMENT ISOLATION FAILURE
- "10" ED JUDGMENT

FPBs are treated the same as EALs in that they are applicable only as long as the condition(s) that meet or exceed their thresholds exist. This is in contrast to ECLs which once declared, remain in place until termination or recovery.

For EALs that contain time imbedded criterion, the Emergency Director should not wait until the applicable time period has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.

Equipment used for monitoring and evaluating plant conditions include routine instrumentation, backup or redundant instrumentation, and the use of other parameter instrumentation that can provide indirect indication.

- When an EAL or FPB refers to a specific instrument or indication that is unavailable prior to an event, alternate indication must be identified to compensate for the loss until the primary indication is restored for the applicable operating mode. Instrumentation used to classify events cannot be removed from service without also implementing adequate compensatory measures.

- When an EAL or FPB refers to a specific instrument or indication that is known to be inaccurate or becomes unavailable during an event (such as off scale high or low), other direct or indirect instrumentation must be used whenever possible. If there are no other direct or indirect means available, then the EAL or FPB can be assumed to have been exceeded consistent with its previous valid trend.

EALs and FPBs are predicated on unplanned events. A planned evolution involves actions to address limitations imposed by the evolution, performance of surveillance testing, and implementation of controls prior to knowingly exceeding a threshold. Planned evolutions to test, manipulate, repair, perform maintenance or modifications to systems and equipment that will knowingly result in an EAL or FPB being met or exceeded are not subject to event declaration as long as the planned actions or compensatory measures do not meet an ECL with regard to level of safety and the evolution proceeds as planned.

All EALs and FPBs assume valid indications, reports or conditions. Indications, reports or conditions are considered valid when they are verified by (1) an instrument channel check, or (2) indications on related or redundant indications, or (3) by direct observation by plant personnel, such that doubt related to the indication's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

Operating Mode Applicability

For purposes of event classification, the following operating mode applicability definitions establish the conditions when the EAL or FPB thresholds represent a threat:

Mode	Reactivity Condition, K_{eff}	% Rated Thermal Power*	Average Reactor Coolant Temperature
1) Power Operation	≥ 0.99	> 5%	N/A
2) Startup	≥ 0.99	≤ 5%	N/A
3) Hot Standby	< 0.99	N/A	≥ 350° F
4) Hot Shutdown	< 0.99	N/A	350° F > T_{AVG} > 200° F
5) Cold Shutdown	< 0.99	N/A	≤ 200° F
6) Refueling	One or more vessel head closure bolts less than fully tensioned.		
D) Defueled	All reactor fuel removed from reactor pressure vessel (full core off load during refueling or extended outage).		

* Excluding decay heat.

ICs are based on the operating mode that exists at the time the event occurred, prior to any protective system or operator action initiated in response.

For events that occur in Cold Shutdown or Refueling, escalation is via EALs that have Cold Shutdown or Refueling for mode applicability, even if Hot Shutdown (or a higher mode) is entered during any subsequent heat-up. In particular, the FPB threshold values are applicable only to events that initiate in Hot Shutdown or higher. If there is a change in operating mode following an event declaration, any subsequent events involving EALs outside of the current declaration escalation path will be evaluated on the mode of the plant at the time the subsequent events occur.

EAL Technical Basis Manual Content

Definitions

A list of definitions is provided for terms having specific meaning to the EALs. EAL terminology definitions are provided with the intent to be used for a particular IC or EAL/FPB threshold value and may not be applicable to other uses of that term in other procedures outside the Emergency Preparedness Program.

EAL Matrix Table

The EAL Technical Basis Manual contains five EAL matrix tables based on the different EAL recognition categories

The EAL matrix is designed as an evaluation tool that organizes the ECLs from the highest (General Emergency) on the left to the lowest (Unusual Event) on the right. Evaluating the EALs for each ECL from highest to lowest reduces the possibility that an event will be under classified. All recognition categories are to be reviewed for applicability prior to event declaration.

Other user aids such as wallboards may be developed from the matrix table to support evaluation of abnormal conditions in other human factored formats.

EAL Documentation Format

Each EAL within the technical bases manual is documented in the following manner:

- IC Identification Number
- Initiating Condition
- Operating Mode Applicability
- EALs or FPB Threshold Value(s)
- Basis
  - Generic
  - Site (or U.S. EPR) Specific
- Basis Reference(s)

Definitions

AFFECTING SAFE SHUTDOWN: Event in progress has adversely affected functions that are necessary to bring the plant to and maintain it in the applicable hot or cold shutdown condition. Plant condition applicability is determined by Technical Specification LCOs in effect.

> Example 1: Event causes damage that results in entry into an LCO that requires the plant to be placed in hot shutdown. Hot shutdown is achievable, but cold shutdown is not. This event is not "affecting safe shutdown."
>
> Example 2: Event causes damage that results in entry into an LCO that requires the plant to be placed in cold shutdown. Hot shutdown is achievable, but cold shutdown is not. This event is "affecting safe shutdown."

BOMB: An explosive device suspected of having sufficient force to damage plant systems or structures.

CIVIL DISTURBANCE: A group of persons violently protesting station operations or activities at the site.

CONFINEMENT BOUNDARY: The barrier(s) between areas containing radioactive substances and the environment.

CONTAINMENT CLOSURE: The procedurally defined actions taken to secure primary containment and its associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions.

EXPLOSION: A rapid, violent, unconfined combustion, or catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.

FAULTED: In a steam generator, the existence of secondary side leakage that results in an uncontrolled drop in steam generator pressure or the steam generator being completely depressurized.

FIRE: Combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute fire. Observation of flame is preferred but is not required if large quantities of smoke and heat are observed.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

HOSTILE ACTION: An act toward a nuclear power plant 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 nuclear power plant. Non-terrorism-based EALs should be used to address such activities, (e.g., violent acts between individuals in the owner controlled area).

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

IMMINENT: Mitigation actions have been ineffective, additional actions are not expected to be successful, and trended information indicates that the event or condition will occur. Where IMMINENT timeframes are specified, they shall apply.

INTRUSION / INTRUDER: A person(s) present in a specified area without authorization. Discovery of a bomb in a specified area is indication of intrusion into that area by a hostile force.

LARGE AIRCRAFT: Aircraft as large as or larger than passenger airliners or air cargo / freight planes (for example; 737, DC9, MD80, MD90, 717 or C-130). Examples of aircraft that would not be considered large are general aviation Cessna, Piper and Lear type private planes as well as police, medical and media helicopters.

NORMAL LEVELS: The highest reading in the past twenty-four hours excluding the current peak value.

NORMAL PLANT OPERATIONS: Activities at the plant site associated with routine testing, maintenance, or equipment operations, in accordance with normal operating or administrative procedures. Entry into abnormal or emergency operating procedures, or deviation from normal security or radiological controls posture, is a departure from normal plant operations.

OWNER CONTROLLED AREA: The property associated with the station and owned by the company. Access is normally limited to persons entering for official business.

PROJECTILE: An object directed toward a Nuclear Power Plant that could cause concern for its continued operability, reliability, or personnel safety.

PROTECTED AREA: An area that normally encompasses all controlled areas within the security protected area fence.

RUPTURED: In a steam generator, existence of primary-to-secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection.

SECURITY CONDITION: Any Security Event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel, or a potential degradation to the level of safety of the plant. A SECURITY CONDITION does not involve HOSTILE ACTION.

SIGNIFICANT TRANSIENT: An unplanned event involving one or more of the following: (1) automatic runback >50% thermal reactor power, (2) electrical load rejection >50% full electrical load, (3) reactor trip, or (4) MHSI actuation.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on management. The strike action must threaten to interrupt normal plant operations.

UNISOLABLE: A breach or leak that cannot be isolated from the Control Room.

UNPLANNED: A parameter change or an event, the reasons for which may be known or unknown, that is not the result of an intended evolution and requires corrective or mitigative actions.

VISIBLE DAMAGE: Damage to equipment or structure that is readily observable without measurements, testing, or analysis and is sufficient to cause concern regarding the continued operability or reliability of the affected structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.

VITAL AREA: Any area, normally within the Protected Area that contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

Abbreviations

AC	Alternating Current
BWR	Boiling Water Reactor
CDE	Committed Dose Equivalent
CFR	Code of Federal Regulations
CSFST	Critical Safety Function Status Tree
DC	Direct Current
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
ECL	Emergency Classification Level
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
ESW	Emergency Service Water
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FSAR	Final Safety Analysis Report
GE	General Emergency
IC	Initiating Condition
Keff	Effective Neutron Multiplication Factor
LCO	Limiting Condition of Operation
LOCA	Loss of Coolant Accident
MHSI	Medium Head Safety Injection
MSIV	Main Steam Isolation Valve
mR	milliRoentgen
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NORAD	North American Aerospace Defense Command
NUMARC	Nuclear Management and Resources Council
OBE	Operating Basis Earthquake
OCA	Owner Controlled Area
ODCM	Offsite Dose Calculation Manual
ORO	Offsite Response Organization
PRA	Probabilistic Risk Assessment
PWR	Pressurized Water Reactor
PSIG	Pounds per Square Inch Gauge
R	Roentgen
RCS	Reactor Coolant System
REM	Roentgen Equivalent Man
RPV	Reactor Pressure Vessel
SCBA	Self-Contained Breathing Apparatus
SG	Steam Generator
SI	Safety Injection
SPDS	Safety Parameter Display System
TEDE	Total Effective Dose Equivalent
TOAF	Top of Active Fuel
UE	Unusual Event
U.S. EPR	U.S Evolutionary Power Reactor

FISSION PRODUCT BARRIER DEGRADATION

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
FG1 1 2 3 4	**FS1** 1 2 3 4	**FA1** 1 2 3 4	**FU1** 1 2 3 4
1. Loss of any two barriers and loss or potential loss of the third barrier.	1. Loss or potential loss of any two barriers.	1. Any loss or any potential loss of either fuel clad or RCS.	1. Any loss or any potential loss of containment.

{Add FC2 containment rad graph here (damage curve based on 300 µCi/gm DEI-131)}

{Add CT2 containment rad graph here (damage curve based on 20% fuel clad)}

	FC – Fuel Clad		RC – Reactor Coolant System		CT - Containment	
Sub-Category	**Loss**	**Potential Loss**	**Loss**	**Potential Loss**	**Loss**	**Potential Loss**
2. Containment Radiation Monitoring	1. Containment radiation monitor ({JYK15 CR101}) **> {Graph FC2(L)1}**.	None	1. Containment radiation monitor ({JYK15 CR101}) **> {RC2(L)1} R/hr**.	None	None	1. Containment radiation monitor ({JYK15 CR101}) **> {Graph CT2(PL)1}**.
3. Core Temperature	1. **{**Calculated Clad Temperature in **Region 3 or higher}**.	1. **{**Calculated Clad Temperature in **Region 2}**.	None	None	None	1. a. **{**Calculated Clad Temperature in **Region 4}**. **AND** b. Restoration procedures not effective within **15 minutes**. **OR** 2. a. **{**Calculated Clad Temperature in **Region 3}**. **AND** b. RCS level ({JEF10 CL081}) **< {CT3(PL)2.b}**. **AND** c. Restoration procedures not effective within **15 minutes**.

FISSION PRODUCT BARRIER DEGRADATION

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
FG1 1 2 3 4 Loss of any two barriers and Loss or Potential Loss of the third barrier.	**FS1** 1 2 3 4 Loss or Potential Loss of any two barriers.	**FA1** 1 2 3 4 Any Loss or any Potential Loss of either Fuel Clad or RCS.	**FU1** 1 2 3 4 Any Loss or any Potential Loss of Containment.

	FC – Fuel Clad		RC – Reactor Coolant System		CT - Containment	
Sub-Category	**Loss**	**Potential Loss**	**Loss**	**Potential Loss**	**Loss**	**Potential Loss**
4. RPV Level	None	1. a. RCS level ({JEF10 CL081}) **< {FC4(PL)1.a}**. **AND** b. **{**Calculated Clad Temperature in **Region 2 or higher}**.	None	None	None	None
5. RCS Leak Rate	None	None	1. RCS leak rate greater than available makeup capacity as indicated by **{**Calculated Clad Temperature in **Region 2 or higher}**.	1. RCS leak rate requires operation of second charging pump to maintain pressurizer level.	None	None
6. SG Tube Leakage / Rupture	None	None	1. RUPTURED SG results in an MHSI actuation.	None	1. RUPTURED SG is also FAULTED outside of containment. **OR** 2. a. Primary-to-Secondary leak rate **> 10 gpm**. **AND** b. UNISOLABLE steam release from affected SG to the environment.	None
7. RCS Activity	1. Coolant activity **> 300 µCi/gm** Dose Equivalent I-131.	None	None	None	None	None
8. Containment Pressure	None	None	None	None	1. A containment pressure rise followed by a rapid UNPLANNED drop in containment pressure. **OR** 2. Containment pressure or IRWST level response not consistent with LOCA conditions.	1. Containment pressure **> 62 psig** and rising. **OR** 2. Containment Hydrogen **> 4%.**
9. Containment Isolation Failure	None	None	None	None	1. a. Failure of **ALL** isolation valves in any one line to close. **AND** b. Direct downstream pathway to the environment exists after containment isolation signal.	None
10. ED Judgment	1. Any condition in the opinion of the Emergency Director that indicates loss of the fuel clad barrier.	1. Any condition in the opinion of the Emergency Director that indicates potential loss of the fuel clad barrier.	1. Any condition in the opinion of the Emergency Director that indicates loss of the RCS barrier.	1. Any condition in the opinion of the Emergency Director that indicates potential loss of the RCS barrier.	1. Any condition in the opinion of the Emergency Director that indicates loss of the containment barrier.	1. Any condition in the opinion of the Emergency Director that indicates potential loss of the containment barrier.

RADIOLOGICAL EFFLUENT / ABNORMAL RADIATION LEVELS

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Radiological Effluents	**RG1** 1 2 3 4 5 6 D Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mRem (10mSv) TEDE or 5000 mRem (50 mSv) CDE Child Thyroid for the actual or projected duration of the release using actual meteorology. **<u>EALs:</u>** **Note:** If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results. 1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RG1.1} µCi/hr** for **15 minutes** or longer. **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER** of the following: • **> 1000 mRem** TEDE • **> 5000 mRem** CDE Child Thyroid **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER** of the following: • Gamma (closed window) dose rate **> 1000 mR/hr** for **60 minutes** or longer. • Air sample analysis **> 5000 mRem** CDE Child Thyroid for one hour of inhalation.	**RS1** 1 2 3 4 5 6 D Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 100 mRem (1 mSv) TEDE or 500 mRem (5 mSv) CDE Child Thyroid for the actual or projected duration of the release using actual meteorology. **<u>EALs:</u>** **Note:** If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results. 1. Vent Stack Noble Gas ((KLK90 FR001}) **> {RS1.1} µCi/hr** for **15 minutes** or longer. **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER** of the following: • **> 100 mRem** TEDE • **> 500 mRem** CDE Child Thyroid **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER** of the following: • Gamma (closed window) dose rate **> 100 mR/hr** for **60 minutes** or longer. • Air sample analysis **> 500 mRem** CDE Child Thyroid for one hour of inhalation.	**RA1** 1 2 3 4 5 6 D Any release of gaseous or liquid radioactivity to the environment greater than 200 times the ODCM limit for 15 minutes or longer. **<u>EALs:</u>** **Note:** In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown. 1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RA1.1} µCi/hr** for **15 minutes** or longer. **OR** 2. **ANY** of the following effluent monitors **> 200 times the ODCM limit** established by a current radioactivity discharge permit for **15 minutes** or longer: • Rad Waste Building Transfer Tank Discharge Line Activity Monitor ({KPK29 CR001/002}) • Discharge permit specified monitor **OR** 3. Confirmed sample analysis for gaseous or liquid releases **> 200 times the ODCM limit** for **15 minutes** or longer.	**RU1** 1 2 3 4 5 6 D Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM limit for 60 minutes or longer. **<u>EALs:</u>** **Note:** In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown. 1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RU1.1} µCi/hr** for **60 minutes** or longer. **OR** 2. **ANY** of the following effluent monitors **> 2 times the ODCM limit** established by a current radioactivity discharge permit for **60 minutes** or longer: • Rad Waste Building Transfer Tank Discharge Line Activity Monitor ({KPK29 CR001/002}) • Discharge permit specified monitor **OR** 3. Confirmed sample analysis for gaseous or liquid releases **> 2 times the ODCM limit** for **60 minutes** or longer.

RADIOLOGICAL EFFLUENT / ABNORMAL RADIATION LEVELS Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Abnormal Radiation Levels			**RA2** 1 2 3 4 5 6 D Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the reactor vessel. **EALs:** 1. A water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal that will result in irradiated fuel becoming uncovered. **OR** 2. **>1000 mR/hr** on **ANY** of the following due to damage to irradiated fuel or loss of water level: • Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) • Fuel Building Spent Fuel Mast Bridge Dose Rate Monitor ({JYK28 CR002}) • Fuel Building Fuel Pool Dose Rate Monitor ({JYK28 CR001}) • Transfer Pit Dose Rate Monitor ({JYK23 CR001})	**RU2** 1 2 3 4 5 6 D UNPLANNED rise in plant radiation levels. **EALs:** 1. a. UNPLANNED water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal as indicated by **ANY** of the following: • Reactor refueling cavity level ({FAK31 CL003 or CL004}) **< {RU2.1.a(b1)} feet**. • Spent fuel pool level ({FAL18 CL001}) **< {RU2.1.a(b2)} feet**. • Fuel transfer canal level ({FAL18 CL004 or CL005}) **< {RU2.1.a(b3)} feet**. • Report of visual observation. **AND** b. Area radiation monitor rise on **ANY** of the following: • Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) • Fuel Building Spent Fuel Mast Bridge Dose Rate Monitor ({JYK28 CR002}) • Fuel Building Fuel Pool Dose Rate Monitor ({JYK28 CR001}) • Transfer Pit Dose Rate Monitor ({JYK23 CR001}) **OR** 2. UNPLANNED area radiation monitor or radiation survey > **1000 times NORMAL LEVELS**.
			RA3 1 2 3 4 5 6 D Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions. **EALs:** 1. Dose rate **> 15 mR/hr** in **ANY** of the following areas requiring continuous occupancy to maintain plant safety functions: • Control Room • Central Alarm Station	

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Security	**HG1** 1 2 3 4 5 6 D HOSTILE ACTION resulting in loss of physical control of the facility. **EALs:** 1. A HOSTILE ACTION has occurred such that plant personnel are unable to operate equipment required to maintain safety functions. **OR** 2. A HOSTILE ACTION has caused failure of spent fuel cooling systems and IMMINENT fuel damage is likely.	**HS1** 1 2 3 4 5 6 D HOSTILE ACTION within the PROTECTED AREA. **EALs:** 1. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Shift Supervisor.	**HA1** 1 2 3 4 5 6 D HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat. **EALs:** 1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the Security Shift Supervisor. **OR** 2. A validated notification from the NRC of a LARGE AIRCRAFT attack threat within **30 minutes** of the site.	**HU1** 1 2 3 4 5 6 D Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant. **EALs:** 1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the Security Shift Supervisor. **OR** 2. A credible site specific security threat notification. **OR** 3. A validated notification from the NRC providing information of an aircraft threat.
CR Evacuation		**HS2** 1 2 3 4 5 6 D Control Room evacuation has been initiated and plant control cannot be established. **EALs:** 1. a. Control Room evacuation has been initiated. **AND** b. Control of the plant cannot be established within **15 minutes**.	**HA2** 1 2 3 4 5 6 D Control Room evacuation has been initiated. **EALs:** 1. Control Room evacuation has been initiated.	

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

Natural or Destructive Phenomena

GENERAL EMERGENCY

SITE AREA EMERGENCY

Table H-1: Safe Shutdown Vital Areas
• Control Room
• Safeguards Buildings
• Containment
• Nuclear Auxiliary Building
• Emergency Power Generating Buildings
• ESWS Cooling Towers

ALERT

HA3 1 2 3 4 5 6 D

Natural or destructive phenomena affecting VITAL AREAS.

EALs:

1. a. Seismic event **> OBE** as indicated by PICS seismic monitoring system.

   AND

   b. Earthquake confirmed by **ANY** of the following:
   - Earthquake felt in plant
   - National Earthquake Center
   - Control Room indication of degraded performance of systems required for the safe shutdown of the plant.

   OR

2. Tornado or high winds **> {100 mph (45 m/s)}** resulting in **EITHER** of the following:
   - VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components.
   - Control Room indication of degraded performance of those safety systems.

   OR

3. Internal flooding in **Table H-1** areas resulting in **EITHER** of the following:
   - Electrical shock hazard that precludes access to operate or monitor safety equipment.
   - Control Room indication of degraded performance of those safety systems.

   OR

4. Turbine failure-generated PROJECTILES resulting in **EITHER** of the following:
   - VISIBLE DAMAGE to or penetration of **ANY** structures in **Table H-1** areas containing safety systems or components.
   - Control Room indication of degraded performance of those safety systems.

   OR

5. Vehicle crash resulting in **EITHER** of the following:
   - VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components.
   - Control Room indication of degraded performance of those safety systems.

UNUSUAL EVENT

HU3 1 2 3 4 5 6 D

Natural or destructive phenomena affecting the PROTECTED AREA.

EALs:

1. a. Seismic event trigger as indicated by PICS seismic monitoring system.

   AND

   b. Earthquake confirmed by **EITHER** of the following:
   - Earthquake felt in plant
   - National Earthquake Center

   OR

2. a. Tornado within the PROTECTED AREA.

   OR

   b. High winds **> {100 mph (45 m/s)}**.

   OR

3. Internal flooding in **Table H-1** areas that has the potential to affect safety related equipment required by Technical Specifications for the current operating mode.

   OR

4. Turbine failure resulting in casing penetration or damage to turbine or generator seals.

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Fire / Explosion		**Table H-1: Safe Shutdown Vital Areas** • Control Room • Safeguards Buildings • Containment • Nuclear Auxiliary Building • Emergency Power Generating Buildings • ESWS Cooling Towers	**HA4** 1 2 3 4 5 6 D FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown. **EALs:** 1. FIRE or EXPLOSION resulting in **EITHER** of the following: • VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components. • Control Room indication of degraded performance of those safety systems.	**HU4** 1 2 3 4 5 6 D FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA. **EALs:** 1. FIRE not extinguished within **15 minutes** of Control Room notification or verification of a Control Room FIRE alarm in actual contact with or immediately adjacent to **ANY** of the **Table H-1** areas. **OR** 2. EXPLOSION within the PROTECTED AREA.
Toxic Gas			**HA5** 1 2 3 4 5 6 D Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize the ability to safely operate or shutdown the reactor. **Note:** If the equipment in the VITAL AREA was inoperable or out of service before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability to safely operate or shutdown the plant beyond that allowed by Technical Specifications at the time of the event. **EALs:** 1. Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize the ability to safely operate or shutdown the reactor.	**HU5** 1 2 3 4 5 6 D Release of toxic, corrosive, asphyxiant or flammable gases deemed detrimental to NORMAL PLANT OPERATIONS. **EALs:** 1. Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect NORMAL PLANT OPERATIONS. **OR** 2. Report by local, county or state officials for evacuation or sheltering of site personnel based on an offsite event.
Judgment	**HG6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of General Emergency. **EALs:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	**HS6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of Site Area Emergency. **EALs:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.	**HA6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert. **EALs:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	**HU6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Unusual Event. **EALs:** 1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress 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 offsite response or monitoring are expected unless further degradation of safety systems occurs.

SYSTEM MALFUNCTIONS - HOT

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Loss of AC	**SG1** 1 2 3 4 Prolonged loss of all offsite and all onsite AC power to emergency busses. **EALs:** 1. a. Loss of **ALL** offsite and **ALL** onsite AC power to 31, 32, 33 and 34 BDA busses. **AND** b. **EITHER** of the following: • Restoration of at least one emergency bus within **2 hours** is not likely. • **{**Calculated Clad Temperature in **Region 4}**.	**SS1** 1 2 3 4 Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer. **EALs:** 1. Loss of **ALL** offsite and **ALL** onsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.	**SA1** 1 2 3 4 AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses. **EALs:** 1. a. AC power to 31, 32, 33 and 34 BDA busses is reduced to a single source for **15 minutes** or longer. **AND** b. Any additional single failure will result in a loss of all AC power to 31, 32, 33 and 34 BDA busses.	**SU1** 1 2 3 4 Loss of all offsite AC power to emergency busses for 15 minutes or longer. **EALs:** 1. Loss of **ALL** offsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.
Loss of DC		**SS2** 1 2 3 4 Loss of vital DC power for 15 minutes or longer. **EALs:** 1. **< 210 VDC** on the vital 31, 32, 33 and 34 BUC busses for **15 minutes** or longer.		
Failure of Protection Systems	**SG3** 1 2 Automatic trip and all manual actions failed to shutdown the reactor and indication of an extreme challenge to the ability to cool the core exists. **EALs:** 1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**. **AND** b. All manual actions failed to shutdown the reactor as indicated by reactor power **> 5%**. **AND** c. **EITHER** of the following have occurred: • **{**Calculated Clad Temperature **in Region 3 or higher}**. • Loss of all four trains of Emergency Feedwater.	**SS3** 1 2 Automatic trip failed to shutdown the reactor and manual actions taken from the reactor control console failed to shutdown the reactor. **EALs:** 1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**. **AND** b. Manual actions taken at the reactor control console failed to shutdown the reactor as indicated by reactor power **> 5%**.	**SA3** 1 2 Automatic trip failed to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor. **EALs:** 1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**. **AND** b. Manual actions taken at the reactor control console successfully shutdown the reactor as indicated by reactor power **< 5%**.	**SU3** 3 4 Inadvertent criticality. **EALs:** 1. UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

SYSTEM MALFUNCTIONS - HOT

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Plant Monitoring		**SS4** 1 2 3 4 Loss of all monitoring functions for 15 minutes or longer with a SIGNIFICANT TRANSIENT in progress. **EALs:** 1. a. Loss of SICS for **15 minutes** or longer. **AND** b. Loss of PICS for **15 minutes** or longer. **AND** c. **ANY** of the following SIGNIFICANT TRANSIENTS are in progress: • Automatic runback **> 50%** thermal power • Electrical load reject **> 50%** full load • Reactor trip • MHSI actuation	**SA4** 1 2 3 4 Loss of all monitoring functions for 15 minutes or longer. **EALs:** 1. a. Loss of SICS for **15 minutes** or longer. **AND** b. Loss of PICS for **15 minutes** or longer.	**SU4** 1 2 3 4 Degradation of monitoring functions for 15 minutes or longer. **EALs:** 1. Loss of SICS for **15 minutes** or longer. **OR** 2. Loss of PICS for **15 minutes** or longer.
T.S. Limits				**SU5** 1 2 3 4 Inability to reach required operating mode within Technical Specification limits. **EALs:** 1. Plant is not brought to required operating mode within Technical Specifications LCO action completion time.
Communications				**SU6** 1 2 3 4 Loss of all onsite or offsite communications capabilities. **EALs:** 1. Loss of **ALL** of the following onsite communication methods affecting the ability to perform routine operations: • {Radios} • {Plant Page} • {Internal Telephone Systems} **OR** 2. Loss of **ALL** of the following offsite communications methods affecting the ability to perform offsite notifications: • {Dedicated Offsite Conference Lines} • {Telecopy Transmittal} • NRC Emergency Notification System - ENS • NRC Health Physics Network - HPN • {External Telephone Systems}

SYSTEM MALFUNCTIONS - HOT

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
RCS Leakage				**SU7** 1 2 3 4 RCS leakage. **EALs:** 1. Unidentified or pressure boundary leakage **> 10 gpm**. **OR** 2. Identified leakage **> 25 gpm**.
Fuel Clad Degradation				**SU9** 1 2 3 4 Fuel clad degradation. **EALs:** 1. Gross Failed Fuel Monitor ({KUA66 CR001}) **> {SU9.1} cpm**. **OR** 2. Coolant sample activity **> 1.0 µCi/gm** dose equivalent I-131.

SYSTEM MALFUNCTIONS - COLD

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Loss of AC			**CA1** 5 6 D Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer. **EALs:** 1. Loss of all offsite and all onsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.	**CU1** 5 6 AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses. **EALs:** 1. a. AC power to 31, 32, 33 and 34 BDA busses is reduced to a single source for **15 minutes** or longer. **AND** b. Any additional single failure will result in a loss of all AC power to 31, 32, 33 and 34 BDA busses.
Loss of DC				**CU2** 5 6 Loss of required DC power for 15 minutes or longer. **EALs:** 1. **< 210 VDC** on the required 31, 32, 33 and 34 BUC busses for **15 minutes** or longer.
Failure of Protection System				**CU3** 5 6 Inadvertent criticality. **EALs:** 1. UNPLANNED sustained positive startup rate observed on nuclear instrumentation.
Communications				**CU6** 5 6 D Loss of all onsite or offsite communications capabilities. **EALs:** 1. Loss of **ALL** of the following onsite communication methods affecting the ability to perform routine operations: • {Radios} • {Plant Page} • {Internal Telephone Systems} **OR** 2. Loss of **ALL** of the following offsite communications methods affecting the ability to perform offsite notifications: • {Dedicated Offsite Conference Lines} • {Telecopy Transmittal} • NRC Emergency Notification System - ENS • NRC Health Physics Network - HPN • {External Telephone Systems}

SYSTEM MALFUNCTIONS - COLD

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

RCS Leakage

GENERAL EMERGENCY

CG7 5 6

Loss of RPV inventory affecting fuel clad integrity with containment challenged.

EALs:

1. a. RPV level **< {96.0 feet (29.3 meters)}** (top of active fuel) for **30 minutes** or longer.

   AND

   b. **ANY Table C-1** containment challenge indications.

OR

2. a. RPV level cannot be monitored with core uncovery indicated by **ANY** of the following for **30 minutes** or longer:
   - Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) **> {CG7.2.a(b1)} mR/hr**.
   - Erratic source range monitor indication.
   - UNPLANNED level rise in IRWST.

   AND

   b. **ANY Table C-1** containment challenge indications.

Table C-1: Containment Challenge Indications
• CONTAINMENT CLOSURE not established.
• Hydrogen concentration > 4% inside containment.
• UNPLANNED rise in containment pressure.

SITE AREA EMERGENCY

CS7 5 6

Loss of RPV inventory affecting core decay heat removal capability.

EALs:

1. a. CONTAINMENT CLOSURE not established.

   AND

   b. Loss of RPV inventory as indicated by RCS level ({JEF10 CL081}) **< {CS7.1.b}**.

OR

2. a. CONTAINMENT CLOSURE established.

   AND

   b. RPV level **< {96.0 feet (29.3 meters)}** (top of active fuel).

OR

3. a. RCS level cannot be monitored for **30 minutes** or longer.

   AND

   b. Loss of RPV inventory as indicated by **ANY** of the following:
   - Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) **> {CS7.3.b(b1)} mR/hr**.
   - Erratic source range monitor indication.
   - UNPLANNED level rise in IRWST.

ALERT

CA7 5 6

Loss of RPV inventory.

EALs:

1. Loss of RPV inventory as indicated by RCS level ({JEF10 CL081}) **< {CA7.1}**.

OR

2. a. RCS level cannot be monitored for **15 minutes** or longer.

   AND

   b. Loss of RPV inventory as indicated by UNPLANNED level rise in IRWST.

UNUSUAL EVENT

CU7 5

RCS leakage.

EALs:

1. RCS leakage results in the inability to maintain or restore RCS level **> Procedure Established Minimum Level** for **15 minutes** or longer.

CU8 6

UNPLANNED loss of RCS inventory.

EALs:

1. a. UNPLANNED RCS level drop below the RPV flange for **15 minutes** or longer when the RCS level band is established above the RPV flange.

   OR

   b. UNPLANNED RCS level drop **< Procedure Established Minimum Level** for **15 minutes** or longer when the RCS level band is established below the RPV flange.

OR

2. a. RCS level cannot be monitored.

   AND

   b. Loss of RPV inventory as indicated by UNPLANNED level rise in IRWST.

Heat Sink

SITE AREA EMERGENCY

Table C-2: RCS Reheat Duration Thresholds

RCS	Cont Closure	Duration
Intact with Full RCS Inventory	N/A	> 60 min*
Not Intact OR Reduced Inventory	Established	> 20 min*
	Not Established	0 min

* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, this EAL is not applicable.

ALERT

CA10 5 6

Inability to maintain plant in cold shutdown.

EALs:

1. RCS temperature **> 200° F** for the specified duration on **Table C-2**.

OR

2. RCS pressure rise **> 10 psig** due to a loss of RCS cooling (this EAL does not apply in solid plant conditions).

UNUSUAL EVENT

CU10 5 6

UNPLANNED loss of decay heat removal capability.

EALs:

1. RCS temperature **> 200° F** due to an UNPLANNED loss of decay heat removal capability.

OR

2. Loss of **ALL** RCS temperature and RCS level indication for **15 minutes** or longer.

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FG1

Initiating Condition:

Loss of any two barriers and loss or potential loss of the third barrier.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

Refer to fission product barrier loss and potential loss threshold values to determine barrier status.

Basis:

Generic

Fuel cladding, RCS and containment comprise the fission product barriers.

At the General Emergency classification level each barrier is weighted equally.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, Tables 5-F-1 and 5-F-3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FS1

Initiating Condition:

Loss or potential loss of any two barriers.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

Refer to fission product barrier loss and potential loss threshold values to determine barrier status.

Basis:

Generic

Fuel cladding, RCS and containment comprise the fission product barriers.

At the Site Area Emergency classification level, each barrier is weighted equally.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, Tables 5-F-1 and 5-F-3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FA1

Initiating Condition:

Any loss or any potential loss of either fuel clad or RCS.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

Refer to fission product barrier loss and potential loss threshold values to determine barrier status.

Basis:

Generic

Fuel cladding, RCS and containment comprise the fission product barriers.

The fuel cladding and RCS barriers are weighted more heavily than the containment barrier. Unlike the containment barrier, loss or potential loss of either the fuel cladding or RCS barrier may result in the relocation of radioactive materials or degradation of core cooling capability. Note that the loss or potential loss of containment barrier in combination with loss or potential loss of either fuel cladding or RCS barrier results in declaration of a Site Area Emergency under FS1.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, Tables 5-F-1 and 5-F-3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FU1

Initiating Condition:

Any loss or any potential loss of containment.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

Refer to fission product barrier loss and potential loss threshold values to determine barrier status.

Basis:

Generic

Fuel cladding, RCS and containment comprise the fission product barriers.

Unlike the Fuel cladding and RCS barriers, the loss of either of which results in an Alert under FA1, loss of the containment barrier in and of itself does not result in the relocation of radioactive materials or the potential for degradation of core cooling capability. However, loss or potential loss of the containment barrier in combination with the loss or potential loss of either the Fuel cladding or RCS barrier results in declaration of a Site Area Emergency under FS1.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, Tables 5-F-1 and 5-F-3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Containment Radiation Monitoring **FC2**

Loss:

1. Containment radiation monitor ({JYK15 CR101}) **> {Graph FC2(L)1}**.

{Add FC2 containment rad graph here (damage curve based on 300 μCi/gm DEI-131)}

Potential Loss:

None

Basis:

Generic

The site (U.S. EPR) specific reading is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the containment.

The reading should be calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 μCi/gm dose equivalent I-131 into the containment atmosphere.

Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage.

This value is higher than that specified for RCS barrier Loss threshold #1.

There is no Potential Loss threshold associated with this item.

Site (U.S. EPR) Specific

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Core Temperature **FC3**

Loss:

1. **{**Calculated Clad Temperature in **Region 3 or higher}**.

Potential Loss:

1. **{**Calculated Clad Temperature in **Region 2}**.

Basis:

Generic

Loss Threshold #1

The site (U.S. EPR) specific reading should correspond to significant superheating of the coolant.

This value typically corresponds to the temperature reading that indicates core cooling - RED for plants with CSFST, which is usually about 1200º F.

Potential Loss Threshold #1

The site (U.S. EPR) specific reading should correspond to loss of subcooling.

This value typically corresponds to the temperature reading that indicates core cooling - ORANGE for plants with CSFST, which is usually about 700º to 900º F.

Site (U.S. EPR) Specific

Loss Threshold #1

{To be added to support EAL value/wording}

Potential Loss Threshold #1

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RPV Level **FC4**

Loss:

None

Potential Loss:

1. a. RCS level ({JEF10 CL081}) **< {FC4(PL)1.a}**.

   AND

   b. **{**Calculated Clad Temperature in **Region 2 or higher}**.

Basis:

Generic

There is no Loss threshold associated with this item.

The site (U.S. EPR) specific value for the Potential Loss threshold corresponds to the top of the active fuel.

Site (U.S. EPR) Specific

For the U.S. EPR, TOAF cannot be read by installed level instrumentation in Modes 1-4. The lowest indicated reactor water level is the bottom of the reactor coolant hot legs (Plant Elevation {+ 101.9 feet (31.1 meters)}).

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. 02-DCD-JAA-1200A0-001
3. 02-DCD-PPY-JE-4001-000

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RCS Activity **FC7**

Loss:

1. Coolant activity **> 300 μCi/gm** Dose Equivalent **I**-131.

Potential Loss:

None

Basis:

Generic

The site (U.S. EPR) specific value corresponds to 300 μCi/gm **I**-131 equivalent. Assessment by the EAL Task Force indicates that this amount of coolant activity is well above that expected for iodine spikes and corresponds to less than 5% fuel clad damage. This amount of radioactivity indicates significant clad damage and thus the Fuel Clad Barrier is considered lost.

There is no Potential Loss threshold associated with this item.

Site (U.S. EPR) Specific

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Emergency Director Judgment **FC10**

Loss:

1. Any condition in the opinion of the Emergency Director that indicates loss of the fuel clad barrier.

Potential Loss:

1. Any condition in the opinion of the Emergency Director that indicates potential loss of the fuel clad barrier.

Basis:

Generic

These thresholds address any other factors that are to be used by the Emergency Director in determining whether the fuel clad barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Containment Radiation Monitoring RC2

Loss:

1. Containment radiation monitor ({JYK15 CR101}) **> {RC2(L)1} R/hr**.

Potential Loss:

None

Basis:

Generic

The site (U.S. EPR) specific reading is a value which indicates the release of reactor coolant to the containment.

The reading should be calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with normal operating concentrations (i.e., within T/S) into the containment atmosphere.

This reading will be less than that specified for FC2(L)1. Thus, this threshold would be indicative of a RCS leak only.

There is no Potential Loss threshold associated with this item.

Site (U.S. EPR) Specific

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RCS Leak Rate RC5

Loss:

1. RCS leak rate greater than available makeup capacity as indicated by **{**Calculated Clad Temperature in **Region 2 or higher}**.

Potential Loss:

1. RCS leak rate requires operation of second charging pump to maintain pressurizer level.

Basis:

Generic

Loss Threshold #1

This threshold addresses conditions where leakage from the RCS is greater than available inventory control capacity such that a loss of subcooling has occurred. The loss of subcooling is the fundamental indication that the inventory control systems are inadequate in maintaining RCS pressure and inventory against the mass loss through the leak.

Potential Loss Threshold #1

This threshold is based on the apparent inability to maintain normal liquid inventory within the Reactor Coolant System (RCS) by normal operation of the Chemical and Volume Control System which is considered to be the flow rate equivalent to one charging pump discharging to the charging header. Isolating letdown is a standard abnormal operating procedure action and may prevent unnecessary classifications when a non-RCS leakage path such as a CVCS leak exists. The intent of this condition is met if attempts to isolate letdown are NOT successful. Additional charging pumps being required is indicative of a substantial RCS leak.

Site (U.S. EPR) Specific

Loss Threshold #1

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

SG Tube Leakage / Rupture **RC6**

Loss:

1. RUPTURED SG results in an MHSI actuation.

Potential Loss:

None

Basis:

Generic

This threshold addresses the full spectrum of Steam Generator (SG) tube rupture events in conjunction with Containment barrier Loss thresholds. It addresses RUPTURED SG(s) for which the leakage is large enough to cause actuation of ECCS (SI). This is consistent to the RCS leak rate barrier Potential Loss threshold.

There is no Potential Loss threshold associated with this item.

Site (U.S. EPR) Specific

U.S. EPR Medium Head Safety Injection (MHSI) is the equivalent to the NEI standard Safety Injection (SI).

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Emergency Director Judgment **RC10**

Loss:

1. Any condition in the opinion of the Emergency Director that indicates loss of the RCS barrier.

Potential Loss:

1. Any condition in the opinion of the Emergency Director that indicates potential loss of the RCS barrier.

Basis:

Generic

These thresholds address any other factors that are to be used by the Emergency Director in determining whether the RCS barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Containment Radiation Monitoring CT2

Loss:

None

Potential Loss:

1. Containment radiation monitor ({JYK15 CR101}) **> {Graph CT2(PL)1}**.

{Add CT2 containment rad graph here (damage curve based on 20% fuel clad)}

Basis:

Generic

There is no Loss threshold associated with this item.

The site (U.S. EPR) specific reading is a value which indicates significant fuel damage well in excess of the thresholds associated with both loss of Fuel Clad and loss of RCS barriers. As stated in Section 3.8 of NEI 99-01 Rev 5, a major release of radioactivity requiring off-site protective actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant.

Regardless of whether containment is challenged, this amount of activity in containment, if released, could have such severe consequences that it is prudent to treat this as a potential loss of containment, such that a General Emergency declaration is warranted.

NUREG-1228, "Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents," indicates that such conditions do not exist when the amount of clad damage is less than 20%.

Site (U.S. EPR) Specific

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Core Temperature CT3

Loss:

None

Potential Loss:

1. a. **{**Calculated Clad Temperature in **Region 4}**.

   AND

   b. Restoration procedures not effective within **15 minutes**.

   OR

2. a. **{**Calculated Clad Temperature in **Region 3}**.

   AND

   b. RCS level ({JEF10 CL081}) **< {CT3(PL)2.b}**.

   AND

   c. Restoration procedures not effective within **15 minutes**.

Basis:

Generic

There is no Loss threshold associated with this item.

The conditions in these thresholds represent an IMMINENT core melt sequence which, if not corrected, could lead to vessel failure and an increased potential for containment failure. In conjunction with the Core Cooling and RCS Leakage criteria in the Fuel and RCS barrier columns, this threshold would result in the declaration of a General Emergency -- loss of two barriers and the potential loss of a third. If the function restoration procedures are ineffective, there is no "success" path.

The function restoration procedures are those emergency operating procedures that address the recovery of the core cooling critical safety functions. The procedure is considered effective if the temperature is decreasing or if the vessel water level is increasing.

Severe accident analyses (e.g., NUREG-1150) have concluded that function restoration procedures can arrest core degradation within the reactor vessel in a significant fraction of the core damage scenarios, and that the likelihood of containment failure is very small in these events. Given this, it is appropriate to provide a reasonable period to allow function restoration procedures to arrest the core melt sequence.

Whether or not the procedures will be effective should be apparent within 15 minutes. The Emergency Director should make the declaration as soon as it is determined that the procedures have been, or will be ineffective.

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT3 (continued)

<u>Site (U.S. EPR) Specific</u>

<u>Potential Loss Threshold #1</u>

{To be added to support EAL value/wording}

<u>Potential Loss Threshold #2</u>

For the U.S. EPR, TOAF cannot be read by installed level instrumentation in Modes 1-4. The lowest indicated reactor water level is the bottom of the reactor coolant hot legs (Plant Elevation {+ 101.9 feet (31.1 m)}).

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. 02-DCD-JAA-1200A0-001
3. 02-DCD-PPY-JE-4001-000

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

SG Tube Leakage / Rupture **CT6**

Loss:

1. RUPTURED SG is also FAULTED outside of containment.

   OR

2. a. Primary-to-Secondary leak rate **> 10 gpm**.

   AND

   b. UNISOLABLE steam release from affected SG to the environment.

Potential Loss:

None

Basis:

Generic

The loss threshold recognizes that SG tube leakage can represent a bypass of the Containment barrier as well as a loss of the RCS barrier.

Users should realize that the two loss thresholds could be considered redundant. This was recognized during the development process. The inclusion of an threshold that uses Emergency Procedure commonly used terms like “RUPTURED and FAULTED” adds to the ease of the classification process and has been included based on this human factor concern.

This threshold results in an Unusual Event for smaller breaks that; (1) do not exceed the normal charging capacity threshold in RCS leak rate barrier Potential Loss threshold, or (2) do not result in ECCS actuation in RCS SG tube rupture barrier Loss threshold. For larger breaks, RCS barrier threshold criteria would result in an Alert. For SG tube ruptures which may involve multiple steam generators or unisolable secondary line breaks, this threshold would exist in conjunction with RCS barrier thresholds and would result in a Site Area Emergency.

Loss Threshold #1

This threshold addresses the condition in which a RUPTURED steam generator is also FAULTED. This condition represents a bypass of the RCS and containment barriers and is a subset of the second threshold. In conjunction with RCS leak rate barrier loss threshold, this would always result in the declaration of a Site Area Emergency.

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT6 (continued)

<u>Loss Threshold #2</u>

This threshold addresses SG tube leaks that exceed 10 gpm in conjunction with a UNISOLABLE release path to the environment from the affected steam generator. The threshold for establishing the UNISOLABLE secondary side release is intended to be a prolonged release of radioactivity from the RUPTURED steam generator directly to the environment. This could be expected to occur when the main condenser is unavailable to accept the contaminated steam (i.e., SG tube rupture with concurrent loss of off-site power and the RUPTURED steam generator is required for plant cooldown or a stuck open relief valve). If the main condenser is available, there may be releases via air ejectors, gland seal exhausters, and other similar controlled, and often monitored, pathways. These pathways do not meet the intent of an UNISOLABLE release path to the environment. These minor releases are assessed using Abnormal Rad Levels / Radiological Effluent ICs.

<u>Site (U.S. EPR) Specific</u>

None

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Containment Pressure **CT8**

Loss:

1. A containment pressure rise followed by a rapid UNPLANNED drop in containment pressure.

   OR

2. Containment pressure or IRWST level response not consistent with LOCA conditions.

Potential Loss:

1. Containment pressure **> 62 psig** and rising.

   OR

2. Containment Hydrogen **> 4%**.

Basis:

Generic

Loss Thresholds #1 and #2

Rapid UNPLANNED loss of pressure (i.e., not attributable to containment spray or condensation effects) following an initial pressure increase from a primary or secondary high energy line break indicates a loss of containment integrity. Containment pressure and sump levels should increase as a result of mass and energy release into containment from a LOCA. Thus, sump level or pressure not increasing indicates containment bypass and a loss of containment integrity.

This indicator relies on operator recognition of an UNPLANNED response for the condition and therefore does not have a specific value associated with it. The UNPLANNED response is important because it is the indicator for a containment bypass condition.

Potential Loss Threshold #1

The site (U.S. EPR) specific pressure is based on the containment design pressure.

Potential Loss Threshold #2

Existence of an explosive mixture means a hydrogen and oxygen concentration of at least the lower deflagration limit curve exists.

Potential Loss Threshold #3

This threshold represents a potential loss of containment in that the containment heat removal/depressurization system (e.g., containment sprays, ice condenser fans, etc., but not including containment venting strategies) are either lost or performing in a degraded manner, as indicated by containment pressure greater than the setpoint at which the equipment was supposed to have actuated.

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT8 (continued)

Site (U.S. EPR) Specific

Potential Loss Threshold #3

The U.S. EPR containment volume, condensation surface area, and heat capacities are such that the containment design pressure is not exceeded during design basis Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) events, In addition, the containment pressure decreases to less than 50% of the accident analysis values in less than 24 hours thus ensuring that radiological dose consequences are acceptable. Mass and energy releases to the containment during LOCA and MSLB events were calculated using RELAP5/MOD2 (B&W), which is an NRC approved methodology. Containment pressure responses were calculated using the GOTHIC code, also an NRC approved methodology. An automatically actuated containment spray system is therefore not required to mitigate the consequences of a Design Basis Accident, so no automatic actuation setpoint exists for this EAL threshold to be based on.

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3
2. U.S. EPR FSAR – Section 6.2.1
3. U.S. EPR FSAR – Section 6.2.2
4. U.S. EPR FSAR – Section 6.5.2
5. U.S. EPR FSAR – Section 15.0.3
6. U.S. EPR FSAR – Section 19.2.3.3

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Containment Isolation Failure or Bypass CT9

Loss:

1. a. Failure of **ALL** isolation valves in any one line to close.

   AND

   b. Direct downstream pathway to the environment exists after containment isolation signal.

Potential Loss:

None

Basis:

Generic

This threshold addresses incomplete containment isolation that allows direct release to the environment.

The use of the modifier “direct” in defining the release path discriminates against release paths through interfacing liquid systems. The existence of an in–line charcoal filter does not make a release path indirect since the filter is not effective at removing fission product noble gases. Typical filters have an efficiency of 95-99% removal of iodine. Given the magnitude of the core inventory of iodine, significant releases could still occur. In addition, since the fission product release would be driven by boiling in the reactor vessel, the high humidity in the release stream can be expected to render the filters ineffective in a short period.

There is no Potential Loss threshold associated with this item.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 4, Table 5-F-4

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

Emergency Director Judgment **CT10**

Loss:

1. Any condition in the opinion of the Emergency Director that indicates loss of the containment barrier.

Potential Loss:

1. Any condition in the opinion of the Emergency Director that indicates potential loss of the containment barrier.

Basis:

Generic

These thresholds address any other factors that are to be used by the Emergency Director in determining whether the Containment barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this threshold as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost.

The Containment barrier should not be declared lost or potentially lost based on exceeding Technical Specification action statement criteria, unless there is an event in progress requiring mitigation by the Containment barrier. When no event is in progress (Loss or Potential Loss of either Fuel Clad and/or RCS) the Containment barrier status is addressed by Technical Specifications.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, Table 5-F-3

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RG1

Initiating Condition:

Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mRem TEDE or 5000 mRem CDE Child Thyroid for the actual or projected duration of the release using actual meteorology.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

Note: If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.

1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RG1.1} µCi/hr** for **15 minutes** or longer.

   OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER** of the following:
   - **> 1000 mRem** TEDE
   - **> 5000 mRem** CDE Child Thyroid

   OR

3. Field survey results at or beyond the site boundary indicate **EITHER** of the following:
   - Gamma (closed window) dose rate **> 1000 mR/hr** for **60 minutes** or longer.
   - Air sample analysis **> 5000 mRem** CDE Child Thyroid for one hour of inhalation.

Basis:

Generic

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed the EPA Protective Action Guides (PAGs). Public protective actions will be necessary. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public and likely involve fuel damage.

The EPA PAGs are expressed in terms of the sum of the effective dose equivalent (EDE) and the committed effective dose equivalent (CEDE), or as the thyroid committed dose equivalent (CDE). For the purpose of these IC/EALs, the dose quantity total effective dose equivalent (TEDE), as defined in 10 CFR 20, is used in lieu of "…sum of EDE and CEDE.…"

The TEDE dose is set at the EPA PAG, while the 5000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

RECOGNITION CATEGORY

RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RG1 (continued)

EAL #1

The site (U.S. EPR) specific monitor list in EAL #1 should include effluent monitors on all potential release pathways.

The monitor reading EALs should be determined using a dose assessment method that back calculates from the dose values specified in the IC. Since doses are generally not monitored in real-time, it is suggested that a release duration of one hour be assumed, and that the EALs be based on a site boundary (or beyond) dose of 1000 mrem whole body or 5000 mrem thyroid in one hour, whichever is more limiting (as was done for EALs #2 and #3). If individual site analyses indicate a longer or shorter duration for the period in which the substantial portion of the activity is released, the longer duration should be used.

The meteorology used should be the same as those used for determining RU1 and RA1 monitor reading EALs. The same source term (noble gases, particulates, and halogens) may also be used as long as it maintains a realistic and near linear escalation between the EALs for the four classifications. If proper escalations do not result from the use of the same source term, if the calculated values are unrealistically high, or if correlation between the values and dose assessment values does not exist, then consider using an accident source term for RS1 and RG1 calculations.

Since dose assessment is based on actual meteorology, whereas the monitor reading EAL is not, the results from these assessments may indicate that the classification is not warranted, or may indicate that a higher classification is warranted. For this reason, emergency implementing procedures should call for the timely performance of dose assessments using actual meteorology and release information. If the results of these dose assessments are available when the classification is made (e.g., initiated at a lower classification level), the dose assessment results override the monitor reading EAL.

Site (U.S. EPR) Specific

EAL #1

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, AG1
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RS1

Initiating Condition:

Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 100 mRem TEDE or 500 mRem CDE Child Thyroid for the actual or projected duration of the release using actual meteorology.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

Note: If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.

1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RS1.1} μCi/hr** for **15 minutes** or longer.

   OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER** of the following:
   - **> 100 mRem** TEDE
   - **> 500 mRem** CDE Child Thyroid

   OR

3. Field survey results at or beyond the site boundary indicate **EITHER** of the following:
   - Gamma (closed window) dose rate **> 100 mR/hr** for **60 minutes** or longer.
   - Air sample analysis **> 500 mRem** CDE Child Thyroid for one hour of inhalation.

Basis:

Generic

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed 10% of the EPA Protective Action Guides (PAGs). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The EPA PAGs are expressed in terms of the sum of the effective dose equivalent (EDE) and the committed effective dose equivalent (CEDE), or as the thyroid committed dose equivalent (CDE). For the purpose of these IC/EALs, the dose quantity total effective dose equivalent (TEDE), as defined in 10 CFR 20, is used in lieu of “…sum of EDE and CEDE.…”

RECOGNITION CATEGORY

RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

The TEDE dose is set at 10% of the EPA PAG, while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS
RS1 (continued)

EAL #1

The site (U.S. EPR) specific monitor list in EAL #1 should include effluent monitors on all potential release pathways.

The monitor reading EALs should be determined using a dose assessment method that back calculates from the dose values specified in the IC. Since doses are generally not monitored in real-time, it is suggested that a release duration of one hour be assumed, and that the EALs be based on a site boundary (or beyond) dose of 100 mrem whole body or 500 mrem thyroid in one hour, whichever is more limiting (as was done for EALs #2 and #3). If individual site analyses indicate a longer or shorter duration for the period in which the substantial portion of the activity is released, the longer duration should be used.

The meteorology used should be the same as those used for determining RU1 and RA1 monitor reading EALs. The same source term (noble gases, particulates, and halogens) may also be used as long as it maintains a realistic and near linear escalation between the EALs for the four classifications. If proper escalations do not result from the use of the same source term, if the calculated values are unrealistically high, or if correlation between the values and dose assessment values does not exist, then consider using an accident source term for RS1 and RG1 calculations.

Since dose assessment is based on actual meteorology, whereas the monitor reading EAL is not, the results from these assessments may indicate that the classification is not warranted, or may indicate that a higher classification is warranted. For this reason, emergency implementing procedures should call for the timely performance of dose assessments using actual meteorology and release information. If the results of these dose assessments are available when the classification is made (e.g., initiated at a lower classification level), the dose assessment results override the monitor reading EAL.

Site (U.S. EPR) Specific

EAL #1

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, AS1
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY

RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RA1

Initiating Condition:

Any release of gaseous or liquid radioactivity to the environment greater than 200 times the ODCM limit for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

Note: In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.

1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RA1.1} µCi/hr** for **15 minutes** or longer.

   OR

2. **ANY** of the following effluent monitors **> 200 times the ODCM limit** established by a current radioactivity discharge permit for **15 minutes** or longer:
   - Rad Waste Building Transfer Tank Discharge Line Activity Monitor (KPK29 CR001/002})
   - Discharge permit specified monitor

   OR

3. Confirmed sample analysis for gaseous or liquid releases **> 200 times the ODCM limit** for **15 minutes** or longer.

Basis:

Generic

This IC addresses an actual or substantial potential decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time.

Nuclear power plants incorporate features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, or control and monitor intentional releases. These controls are located in the Offsite Dose Calculation Manual (ODCM). The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of a degradation in these features and/or controls.

The ODCM multiples are specified in RU1 and RA1 only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an off-site dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, not the magnitude of the associated dose or dose rate.

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS
RA1 (continued)

Releases should not be prorated or averaged. For example, a release exceeding 600x ODCM for 5 minutes does not meet the threshold.

This EAL includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit.

EAL #1

This EAL is intended for sites that have established effluent monitoring on non-routine release pathways for which a discharge permit would not normally be prepared.

To ensure a realistic near-linear escalation path, a value should be selected roughly half-way between the RU1 EAL #1 value and the value calculated for RS1 EAL #1 value. The value will be based on radiation monitor readings to exceed 200 times the Technical Specification limit and releases are not terminated within 60 minutes. The ODCM establishes a methodology for determining effluent radiation monitor setpoints. The ODCM specifies default source terms and, for gaseous releases, prescribes the use of pre-determined annual average meteorology in the most limiting downwind sector for showing compliance with the regulatory commitments. This EAL can be determined using this methodology if appropriate.

EAL #2

This EAL addresses radioactivity releases, that for whatever reason, cause effluent radiation monitor readings to exceed the threshold identified in the IC established by the radioactivity discharge permit. This value may be associated with a planned batch release, or a continuous release path.

In either case, the value is established by the ODCM to warn of a release that is not in compliance. Indexing the EAL to the ODCM setpoints in this manner insures that the EAL will never be less than the setpoint established by a specific discharge permit.

EAL #3

This EAL addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

Site (U.S. EPR) Specific

The U.S. EPR Radiological Effluent Controls Program (RECP) limits either are the same or less restrictive than the ODCM.

EAL #1

{To be added to support EAL value/wording}

EAL #2

An elevated monitor reading while the effluent flow path is isolated is not considered a VALID reading.

RECOGNITION CATEGORY

RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RA1 (continued)

The effluent monitors listed are those normally used for planned discharges. If a discharge is performed using a different flowpath or effluent monitor (e.g., a portable or temporary effluent monitor), then the declaration criteria will be based on the monitor specified in the Discharge Permit.

Should 200 times the high alarm setpoint result in an offscale high meter reading, then the EAL would be considered met when the meter goes offscale high for 15 minutes or longer, provided there are no other direct or indirect means available to determine actual value.

EAL #3

Grab samples are used to; determine release concentrations or release rates, confirm meter readings, or indicate the need for sampling when the effluent monitors are not in service or other alarms occur. The maximum instantaneous release rate limits are calculated in accordance with the ODCM. These are indicated on approved discharge permit release packages.

Basis Reference(s):

1. NEI 99-01 Rev 5, AA1
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RU1

Initiating Condition:

Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM limit for 60 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

Note: In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.

1. Vent Stack Noble Gas ({KLK90 FR001}) **> {RU1.1} µCi/hr** for **60 minutes** or longer.

   OR

2. **ANY** of the following effluent monitors **> 2 times the ODCM limit** established by a current radioactivity discharge permit for **60 minutes** or longer:
   - Rad Waste Building Transfer Tank Discharge Line Activity Monitor ({KPK29 CR001/002})
   - Discharge permit specified monitor

   OR

3. Confirmed sample analysis for gaseous or liquid releases **> 2 times the ODCM limit** for **60 minutes** or longer.

Basis:

Generic

This IC addresses a potential decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time.

Nuclear power plants incorporate features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, or control and monitor intentional releases. These controls are located in the Offsite Dose Calculation Manual (ODCM). The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of a degradation in these features and/or controls.

The ODCM multiples are specified in RU1 and RA1 only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an off-site dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, not the magnitude of the associated dose or dose rate.

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS
RU1 (continued)

Releases should not be prorated or averaged. For example, a release exceeding 4x ODCM for 30 minutes does not meet the threshold.

This EAL includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit.

EAL #1

This EAL addresses radioactivity releases, that for whatever reason, cause effluent radiation monitor readings to exceed the threshold identified in the IC.

This EAL is intended for sites that have established effluent monitoring on non-routine release pathways for which a discharge permit would not normally be prepared.

The ODCM establishes a methodology for determining effluent radiation monitor setpoints. The ODCM specifies default source terms and, for gaseous releases, prescribes the use of pre-determined annual average meteorology in the most limiting downwind sector for showing compliance with the regulatory commitments. This EAL is determined using this methodology.

EAL #2

This EAL addresses radioactivity releases, that for whatever reason, cause effluent radiation monitor readings to exceed the threshold identified in the IC established by the radioactivity discharge permit. This value may be associated with a planned batch release, or a continuous release path.

In either case, the value is established by the ODCM to warn of a release that is not in compliance. Indexing the EAL to the ODCM setpoints in this manner insures that the EAL will never be less than the setpoint established by a specific discharge permit.

EAL #3

This EAL addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

Site (U.S. EPR) Specific

The U.S. EPR Radiological Effluent Controls Program (RECP) limits either are the same or less restrictive than the ODCM.

EAL #1

{To be added to support EAL value/wording}

EAL #2

An elevated monitor reading while the effluent flow path is isolated is not considered a VALID reading.

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS
RU1 (continued)

The effluent monitors listed are those normally used for planned discharges. If a discharge is performed using a different flowpath or effluent monitor (e.g., a portable or temporary effluent monitor), then the declaration criteria will be based on the monitor specified in the Discharge Permit.

EAL #3

Grab samples are used to; determine release concentrations or release rates, confirm meter readings, or indicate the need for sampling when the effluent monitors are not in service or other alarms occur. The maximum instantaneous release rate limits are calculated in accordance with the ODCM. These are indicated on approved discharge permit release packages.

Basis Reference(s):

1. NEI 99-01 Rev 5, AU1
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RA2

Initiating Condition:

Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the reactor vessel.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. A water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal that will result in irradiated fuel becoming uncovered.

   OR

2. **>1000 mR/hr** on **ANY** of the following due to damage to irradiated fuel or loss of water level:
   - Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003})
   - Fuel Building Spent Fuel Mast Bridge Dose Rate Monitor ({JYK28 CR002})
   - Fuel Building Fuel Pool Dose Rate Monitor ({JYK28 CR001})
   - Transfer Pit Dose Rate Monitor ({JYK23 CR001})

Basis:

Generic

This IC addresses increases in radiation dose rates within plant buildings, and may be a precursor to a radioactivity release to the environment. These events represent a loss of control over radioactive material and represent an actual or substantial potential degradation in the level of safety of the plant.

These events escalate from RU2 in that fuel activity has been released, or is anticipated due to fuel heatup. This IC applies to spent fuel requiring water coverage and is not intended to address spent fuel which is licensed for dry storage.

EAL #1

Site (U.S. EPR) specific indications may include instrumentation such as water level and local area radiation monitors, and personnel (e.g., refueling crew) reports. If available, video cameras may allow remote observation. Depending on available level instrumentation, the declaration threshold may need to be based on indications of water makeup rate or decrease in water storage tank level.

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS
RA2 (continued)

EAL #2

This EAL addresses radiation monitor indications of fuel uncovery and/or fuel damage.

Increased ventilation monitor readings may be indication of a radioactivity release from the fuel, confirming that damage has occurred. Increased background at the ventilation monitor due to water level decrease may mask increased ventilation exhaust airborne activity and needs to be considered.

While a radiation monitor could detect an increase in dose rate due to a drop in the water level, it might not be a reliable indication of whether or not the fuel is covered.

For example, a refueling bridge radiation monitor reading may increase due to planned evolutions such as head lift, or even a fuel assembly being raised in the manipulator mast. Also, a monitor could in fact be properly responding to a known event involving transfer or relocation of a source, stored in or near the fuel pool or responding to a planned evolution such as removal of the reactor head. Generally, increased radiation monitor indications will need to combined with another indicator (or personnel report) of water loss.

Site (U.S. EPR) Specific

EAL #2

NUREG/CR-4982 indicates that even if corrective actions are not taken when spent fuel becomes uncovered, no prompt fatalities are predicted and the risk of injury is low. Therefore, a period of time will be available to take corrective actions prior to the actual onset of fuel damage.

Visual observation of spent fuel uncovery represents a major ALARA concern in that radiation levels could exceed 10,000 R/hr on the refuel bridge when fuel uncovery begins. The value of 1000 mR/hr was conservatively chosen for classification purposes.

Basis Reference(s):

1. NEI 99-01 Rev 5, AA2
2. Information Notice No. 90-08, KR-85 Hazards from Decayed Fuel
3. NUREG/CR-4982, Severe Accident in Spent Fuel Pools in Support of Generic Safety Issue 82, July 1987

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RU2

Initiating Condition:

UNPLANNED rise in plant radiation levels.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. a. UNPLANNED water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal as indicated by **ANY** of the following:
   - Reactor refueling cavity level ({FAK31 CL003 or CL004}) **< {RU2.1.a(b1)} feet**.
   - Spent fuel pool level ({FAL18 CL001}) **< {RU2.1.a(b2)} feet**.
   - Fuel transfer canal level ({FAL18 CL004 or CL005}) **< {RU2.1.a(b3)} feet**.
   - Report of visual observation.

   AND

   b. Area radiation monitor rise on **ANY** of the following:
   - Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003})
   - Fuel Building Spent Fuel Mast Bridge Dose Rate Monitor ({JYK28 CR002})
   - Fuel Building Fuel Pool Dose Rate Monitor ({JYK28 CR001})
   - Transfer Pit Dose Rate Monitor ({JYK23 CR001})

   OR

2. UNPLANNED area radiation monitor or radiation survey **> 1000 times NORMAL LEVELS**.

Basis:

Generic

This IC addresses increased radiation levels as a result of water level decreases above irradiated fuel or events that have resulted, or may result, in UNPLANNED increases in radiation dose rates within plant buildings. These radiation increases represent a loss of control over radioactive material and represent a potential degradation in the level of safety of the plant.

RECOGNITION CATEGORY

RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RU2 (continued)

EAL #1

Site (U.S. EPR) specific indications may include instrumentation such as water level and local area radiation monitors, and personnel (e.g., refueling crew) reports. If available, video cameras may allow remote observation. Depending on available level instrumentation, the declaration threshold may need to be based on indications of water makeup rate or decrease in water storage tank level.

While a radiation monitor could detect an increase in dose rate due to a drop in the water level, it might not be a reliable indication of whether or not the fuel is covered.

For example, a refueling bridge radiation monitor reading may increase due to planned evolutions such as head lift, or even a fuel assembly being raised in the manipulator mast. Also, a monitor could in fact be properly responding to a known event involving transfer or relocation of a source, stored in or near the fuel pool or responding to a planned evolution such as removal of the reactor head. Generally, increased radiation monitor indications will need to combined with another indicator (or personnel report) of water loss.

For refueling events where the water level drops below the RPV flange classification would be via CU8.

EAL #2

This EAL addresses increases in plant radiation levels that represent a loss of control of radioactive material resulting in a potential degradation in the level of safety of the plant.

This EAL excludes radiation level increases that result from planned activities such as use of radiographic sources and movement of radioactive waste materials. A specific list of ARMs is not required as it would restrict the applicability of the Threshold. The intent is to identify loss of control of radioactive material in any monitored area.

Site (U.S. EPR) Specific

EAL #1

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, AU2
2. Information Notice No. 90-08, KR-85 Hazards from Decayed Fuel
3. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
RADIOLOGICAL EFFLUENTS / ABNORMAL RADIATION LEVELS

RA3

Initiating Condition:

Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. Dose rate **> 15 mR/hr** in **ANY** of the following areas requiring continuous occupancy to maintain plant safety functions:
   - Control Room
   - Central Alarm Station

Basis:

Generic

This IC addresses increased radiation levels that impact continued operation in areas requiring continuous occupancy to maintain safe operation or to perform a safe shutdown.

The cause and/or magnitude of the increase in radiation levels is not a concern of this IC. The Emergency Director must consider the source or cause of the increased radiation levels and determine if any other IC may be involved.

The value of 15mR/hr is derived from the GDC 19 value of 5 rem in 30 days with adjustment for expected occupancy times. Although Section III.D.3 of NUREG-0737, "Clarification of TMI Action Plan Requirements", provides that the 15 mR/hr value can be averaged over the 30 days, the value is used here without averaging, as a 30 day duration implies an event potentially more significant than an Alert.

Areas requiring continuous occupancy include the control room and, as appropriate to the site, any other control stations that are staffed continuously, such as a radwaste control room, or a security alarm station.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, AA3
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HG1

Initiating Condition:

HOSTILE ACTION resulting in loss of physical control of the facility.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. A HOSTILE ACTION has occurred such that plant personnel are unable to operate equipment required to maintain safety functions.

   OR

2. A HOSTILE ACTION has caused failure of spent fuel cooling systems and IMMINENT fuel damage is likely.

Basis:

Generic

EAL #1

This EAL encompasses conditions under which a HOSTILE ACTION has resulted in a loss of physical control of VITAL AREAS (containing vital equipment or controls of vital equipment) required to maintain safety functions and control of that equipment cannot be transferred to and operated from another location.

Typically, these safety functions are reactivity control (ability to shut down the reactor and keep it shutdown), RCS inventory (ability to cool the core), and secondary heat removal (ability to maintain a heat sink).

Loss of physical control of the control room or remote shutdown capability alone may not prevent the ability to maintain safety functions. Design of the remote shutdown capability and the location of the transfer switches should be taken into account. Primary emphasis should be placed on those components and instruments that supply protection for and information about safety functions.

If control of the plant equipment necessary to maintain safety functions can be transferred to another location, then the threshold is not met.

EAL #2

This EAL addresses failure of spent fuel cooling systems as a result of HOSTILE ACTION if IMMINENT fuel damage is likely, such as when a freshly off-loaded reactor core is in the spent fuel pool.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, HG1

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS1

Initiating Condition:

HOSTILE ACTION within the PROTECTED AREA.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Shift Supervisor.

Basis:

Generic

This condition represents an escalated threat to plant safety above that contained in the Alert in that a HOSTILE FORCE has progressed from the OWNER CONTROLLED AREA to the PROTECTED AREA.

This EAL addresses the contingency for a very rapid progression of events, such as that experienced on September 11, 2001. It is not premised solely on the potential for a radiological release. Rather the issue includes the need for rapid assistance due to the possibility for significant and indeterminate damage from additional air, land or water attack elements.

The fact that the site is under serious attack with minimal time available for further preparation or additional assistance to arrive requires ORO readiness and preparation for the implementation of protective measures.

This EAL addresses the potential for a very rapid progression of events due to a HOSTILE ACTION. It is not intended to address incidents that are accidental events or acts of civil disobedience, such as small aircraft impact, hunters, or physical disputes between employees within the PROTECTED AREA. Those events are adequately addressed by other EALs.

Although nuclear plant security officers are well trained and prepared to protect against HOSTILE ACTION, it is appropriate for OROs to be notified and encouraged to begin preparations for public protective actions (if they do not normally) to be better prepared should it be necessary to consider further actions.

If not previously notified by NRC that the airborne HOSTILE ACTION was intentional, then it would be expected, although not certain, that notification by an appropriate Federal agency would follow. In this case, appropriate federal agency is intended to be NORAD, FBI, FAA or NRC. However, the declaration should not be unduly delayed awaiting Federal notification.

Site (U.S. EPR) Specific

None

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS1 (continued)

Basis Reference(s):

1. NEI 99-01 Rev 5, HS4

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA1

Initiating Condition:

HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the Security Shift Supervisor.

   OR

2. A validated notification from the NRC of a LARGE AIRCRAFT attack threat within **30 minutes** of the site.

Basis:

Generic

These EALs address the contingency for a very rapid progression of events, such as that experienced on September 11, 2001. They are not premised solely on the potential for a radiological release. Rather the issue includes the need for rapid assistance due to the possibility for significant and indeterminate damage from additional air, land or water attack elements.

The fact that the site is under serious attack or is an identified attack target with minimal time available for further preparation or additional assistance to arrive requires a heightened state of readiness and implementation of protective measures that can be effective (such as on-site evacuation, dispersal or sheltering).

EAL #1

This EAL addresses the potential for a very rapid progression of events due to a HOSTILE ACTION. It is not intended to address incidents that are accidental events or acts of civil disobedience, such as small aircraft impact, hunters, or physical disputes between employees within the OCA. Those events are adequately addressed by other EALs.

Note that this EAL is applicable for any HOSTILE ACTION occurring, or that has occurred, in the OWNER CONTROLLED AREA. This includes ISFSI's that may be outside the PROTECTED AREA but still within the OWNER CONTROLLED AREA.

Although nuclear plant security officers are well trained and prepared to protect against HOSTILE ACTION, it is appropriate for OROs to be notified and encouraged to begin activation (if they do not normally) to be better prepared should it be necessary to consider further actions.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA1 (continued)

If not previously notified by the NRC that the airborne HOSTILE ACTION was intentional, then it would be expected, although not certain, that notification by an appropriate Federal agency would follow. In this case, appropriate federal agency is intended to be NORAD, FBI, FAA or NRC. However, the declaration should not be unduly delayed awaiting Federal notification.

EAL #2

This EAL addresses the immediacy of an expected threat arrival or impact on the site within a relatively short time.

The intent of this EAL is to ensure that notifications for the airliner attack threat are made in a timely manner and that OROs and plant personnel are at a state of heightened awareness regarding the credible threat. Airliner is meant to be a large aircraft with the potential for causing significant damage to the plant.

This EAL is met when a plant receives information regarding an airliner attack threat from NRC and the airliner is within 30 minutes of the plant. Only the plant to which the specific threat is made need declare the Alert.

The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an airliner (airliner is meant to be a large aircraft with the potential for causing significant damage to the plant). The status and size of the plane may be provided by NORAD through the NRC.

Site (U.S. EPR) Specific

EAL #2

LARGE AIRCRAFT is the U.S. EPR specific term used for airliner.

Basis Reference(s):

1. NEI 99-01 Rev 5, HA4

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU1

Initiating Condition:

Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the Security Shift Supervisor.

   OR

2. A credible site specific security threat notification.

   OR

3. A validated notification from the NRC providing information of an aircraft threat.

Basis:

<u>Generic</u>

Security events which do not represent a potential degradation in the level of safety of the plant are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under HA8, HS4 and HG1.

A higher initial classification could be made based upon the nature and timing of the security threat and potential consequences. The licensee shall consider upgrading the emergency response status and emergency classification level in accordance with the site's Safeguards Contingency Plan and Emergency Plan.

<u>EAL #1</u>

Reference is made to site (U.S. EPR) specific security shift supervision because these individuals are the designated personnel on-site qualified and trained to confirm that a security event is occurring or has occurred. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the plant Safeguards Contingency Plan.

This threshold is based on site specific security plans. Site specific Safeguards Contingency Plans are based on guidance provided by NEI 03-12.

<u>EAL #2</u>

This threshold is included to ensure that appropriate notifications for the security threat are made in a timely manner. This includes information of a credible threat. Only the plant to which the specific threat is made need declare the Unusual Event.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU1 (continued)

The determination of "credible" is made through use of information found in the site specific Safeguards Contingency Plan.

EAL #3

The intent of this EAL is to ensure that notifications for the aircraft threat are made in a timely manner and that OROs and plant personnel are at a state of heightened awareness regarding the credible threat. It is not the intent of this EAL to replace existing non-hostile related EALs involving aircraft.

This EAL is met when a plant receives information regarding an aircraft threat from the NRC. Validation is performed by calling the NRC or by other approved methods of authentication. Only the plant to which the specific threat is made need declare the Unusual Event.

The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an airliner (airliner is meant to be a large aircraft with the potential for causing significant damage to the plant). The status and size of the plane may be provided by NORAD through the NRC.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, HU4

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS2

Initiating Condition:

Control Room evacuation has been initiated and plant control cannot be established.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. a. Control Room evacuation has been initiated.

   AND

   b. Control of the plant cannot be established within **15 minutes**.

Basis:

Generic

The intent of this IC is to capture those events where control of the plant cannot be reestablished in a timely manner. In this case, expeditious transfer of control of safety systems has not occurred (although fission product barrier damage may not yet be indicated).

The intent of the EAL is to establish control of important plant equipment and knowledge of important plant parameters in a timely manner. Primary emphasis should be placed on those components and instruments that supply protection for and information about safety functions. Typically, these safety functions are reactivity control (ability to shutdown the reactor and maintain it shutdown), RCS inventory (ability to cool the core), and secondary heat removal (ability to maintain a heat sink).

The determination of whether or not control is established at the remote shutdown panel is based on Emergency Director judgment. The Emergency Director is expected to make a reasonable, informed judgment within the site specific time for transfer that the licensee has control of the plant from the remote shutdown panel.

The site specific time for transfer is based on analysis or assessments as to how quickly control must be reestablished without core uncovering and/or core damage. This time should not exceed 15 minutes without additional justification.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HS2

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA2

Initiating Condition:

Control Room evacuation has been initiated.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. Control Room evacuation has been initiated.

Basis:

<u>Generic</u>

With the control room evacuated, additional support, monitoring and direction through the Technical Support Center and/or other emergency response facilities may be necessary.

<u>Site (U.S. EPR) Specific</u>

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HA5

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA3

Initiating Condition:

Natural or destructive phenomena affecting VITAL AREAS.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. a. Seismic event **> OBE** as indicated by PICS seismic monitoring system.

   AND

   b. Earthquake confirmed by **ANY** of the following:

   - Earthquake felt in plant
   - National Earthquake Center
   - Control Room indication of degraded performance of systems required for the safe shutdown of the plant.

   OR

2. Tornado or high winds **> {100 mph (45 m/s)}** resulting in **EITHER** of the following:

   - VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components.
   - Control Room indication of degraded performance of those safety systems.

   OR

3. Internal flooding in **Table H-1** areas resulting in **EITHER** of the following:

   - Electrical shock hazard that precludes access to operate or monitor safety equipment.
   - Control Room indication of degraded performance of those safety systems.

   OR

4. Turbine failure-generated PROJECTILES resulting in **EITHER** of the following:

   - VISIBLE DAMAGE to or penetration of **ANY** structures in **Table H-1** areas containing safety systems or components.
   - Control Room indication of degraded performance of those safety systems.

   OR

5. Vehicle crash resulting in **EITHER** of the following:

   - VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components.
   - Control Room indication of degraded performance of those safety systems.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA3 (continued)

Table H-1: Safe Shutdown Vital Areas
• Control Room • Safeguards Buildings • Containment • Nuclear Auxiliary Building • Emergency Power Generating Buildings • ESWS Cooling Towers

Basis:

Generic

These EALs escalate from HU3 in that the occurrence of the event has resulted in VISIBLE DAMAGE to plant structures or areas containing equipment necessary for a safe shutdown, or has caused damage to the safety systems in those structures evidenced by control room indications of degraded system response or performance. The occurrence of VISIBLE DAMAGE and/or degraded system response is intended to discriminate against lesser events. The initial report should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this EAL to assess the actual magnitude of the damage. The significance here is not that a particular system or structure was damaged, but rather, that the event was of sufficient magnitude to cause this degradation.

EALs #2 - #6

These EALs should specify site (U.S. EPR) specific structures or areas that contain safety system, or component and functions required for safe shutdown of the plant. Site specific Safe Shutdown Analysis should be consulted for equipment and plant areas required to establish or maintain safe shutdown.

EAL #1

Seismic events of this magnitude can result in a VITAL AREA being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems.

This threshold should be based on site specific FSAR design basis. See EPRI-sponsored "Guidelines for Nuclear Plant Response to an Earthquake", dated October 1989, for information on seismic event categories.

The National Earthquake Center can confirm if an earthquake has occurred in the area of the plant.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA3 (continued)

EAL #2

This EAL is based on a tornado striking (touching down) or high winds that have caused VISIBLE DAMAGE to structures containing functions or systems required for safe shutdown of the plant.

The high wind value should be based on site (U. S. EPR) specific FSAR design basis as long as it is within the range of the instrumentation available for wind speed.

EAL #3

This EAL addresses the effect of internal flooding caused by events such as component failures, equipment misalignment, or outage activity mishaps. It is based on the degraded performance of systems, or has created industrial safety hazards (e.g., electrical shock) that preclude necessary access to operate or monitor safety equipment. The inability to access, operate or monitor safety equipment represents an actual or substantial potential degradation of the level of safety of the plant.

Flooding as used in this EAL describes a condition where water is entering the room faster than installed equipment is capable of removal, resulting in a rise of water level within the room. Classification of this EAL should not be delayed while corrective actions are being taken to isolate the water source.

The site (U.S. EPR) specific areas include those areas that contain systems required for safe shutdown of the plant, which are not designed to be partially or fully submerged. The plant’s IPEEE (PRA) may provide insight into areas to be considered when developing this EAL.

EAL #4

This EAL addresses the threat to safety related equipment imposed by PROJECTILEs generated by main turbine rotating component failures. Therefore, this EAL is consistent with the definition of an ALERT in that the potential exists for actual or substantial potential degradation of the level of safety of the plant.

The site (U.S. EPR) specific list of areas should include all areas containing safety structure, system, or component, their controls, and their power supplies.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA3 (continued)

EAL #5

This EAL addresses vehicle crashes within the PROTECTED AREA that results in VISIBLE DAMAGE to VITAL AREAS or indication of damage to safety structures, systems, or components containing functions and systems required for safe shutdown of the plant.

EAL #6

This EAL addresses other site specific phenomena that result in VISIBLE DAMAGE to VITAL AREAS or results in indication of damage to safety structures, systems, or components containing functions and systems required for safe shutdown of the plant (such as hurricane, flood, or seiche) that can also be precursors of more serious events.

Site (U.S. EPR) Specific

EAL #1

As defined in the EPRI-sponsored “Guidelines for Nuclear Plant Response to an Earthquake”, dated October 1989, a “felt earthquake” is: “An earthquake of sufficient intensity such that: (a) the inventory ground motion is felt at the nuclear plant site and recognized as an earthquake based on a consensus of Control Room operators on duty at the time, and (b) for plants with operable seismic instrumentation, the seismic switches of the plant are activated.

The U.S. EPR Maximum Probable Earthquake is 0.30g.

EAL #2

The U.S. EPR maximum wind speed is 145 miles per hour, however the actual wind speed value to be used in the EAL is limited to the lower of (1) the maximum design wind speed of 145 miles per hour or (2) the maximum recordable wind speed based on the site specific meteorological equipment.

Wind speed is obtained from meteorological data in the Control Room that is averaged over a 15 minute period to prevent instantaneous wind gusts or fluctuations from affecting the measurement.

EAL #6

{Not applicable to BBNPP.}

Basis Reference(s):

1. NEI 99-01, Rev 5 HA1
2. U.S. EPR FSAR Section 3.7.1.1.1
3. U.S. EPR FSAR Section 3.3
4. U.S. EPR FSAR Section 3.4.2

{5. BBNPP FSAR Section 2.4.1.1}

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU3

Initiating Condition:

Natural or destructive phenomena affecting the PROTECTED AREA.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. a. Seismic event trigger as indicated by PICS seismic monitoring system.

   AND

   b. Earthquake confirmed by **EITHER** of the following:

   - Earthquake felt in plant
   - National Earthquake Center

   OR

2. a. Tornado within the PROTECTED AREA.

   OR

   b. High winds **> {100 mph (44.7 m/s)}**.

   OR

3. Internal flooding in **Table H-1** areas that has the potential to affect safety related equipment required by Technical Specifications for the current operating mode.

   OR

4. Turbine failure resulting in casing penetration or damage to turbine or generator seals.

Table H-1: Safe Shutdown Vital Areas
• Control Room
• Safeguards Buildings
• Containment
• Nuclear Auxiliary Building
• Emergency Power Generating Buildings
• ESWS Cooling Towers

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU3 (continued)

Basis:

Generic

These EALs are categorized on the basis of the occurrence of an event of sufficient magnitude to be of concern to plant operators.

EAL #1

Damage may be caused to some portions of the site, but should not affect ability of safety functions to operate.

As defined in the EPRI-sponsored Guidelines for Nuclear Plant Response to an Earthquake, dated October 1989, a "felt earthquake" is: An earthquake of sufficient intensity such that: (a) the vibratory ground motion is felt at the nuclear plant site and recognized as an earthquake based on a consensus of control room operators on duty at the time, and (b) for plants with operable seismic instrumentation, the seismic switches of the plant are activated.

For most plants with seismic instrumentation, the seismic switches are set at an acceleration of about 0.01g. This EAL should be developed on site specific basis. The method of detection can be based on instrumentation, validated by a reliable source, or operator assessment.

The National Earthquake Center can confirm if an earthquake has occurred in the area of the plant.

EAL #2

This EAL is based on a tornado striking (touching down) or high winds within the PROTECTED AREA.

The high wind value should be based on site (U.S. EPR) specific FSAR design basis as long as it is within the range of the instrumentation available for wind speed.

EAL #3

This EAL addresses the effect of internal flooding caused by events such as component failures, equipment misalignment, or outage activity mishaps.

The site specific areas include those areas that contain systems required for safe shutdown of the plant, which are not designed to be partially or fully submerged. The plant's IPEEE (PRA) may provide insight into areas to be considered when developing this EAL.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU3 (continued)

EAL #4

This EAL addresses main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the turbine generator. Generator seal damage observed after generator purge does not meet the intent of this EAL because it did not impact normal operation of the plant.

Of major concern is the potential for leakage of combustible fluids (lubricating oils) and gases (hydrogen cooling) to the plant environs. Actual FIRES and flammable gas build up are appropriately classified via HA4 and HU4.

This EAL is consistent with the definition of an Unusual Event while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment.

EAL #5

This EAL addresses other site specific phenomena (such as hurricane, flood, or seiche) that can also be precursors of more serious events.

Site (U.S. EPR) Specific

EAL #1

PICS indication of trigger actuation (minimal level of earthquake to initiate recorder) is appropriate as seismic system indication of detection of earthquake.

EAL #2

The U.S. EPR maximum wind speed is 145 miles per hour, however the actual wind speed value to be used in the EAL is limited to the lower of (1) the maximum design wind speed of 145 miles per hour or (2) the maximum recordable wind speed based on the site specific meteorological equipment. Wind speed is obtained from meteorological data in the Control Room that is averaged over a 15 minute period to prevent instantaneous wind gusts or fluctuations from affecting the measurement.

EAL #5

{Not applicable to BBNPP.}

Basis Reference(s):

1. NEI 99-01, Rev 5 HU1
2. U.S. EPR FSAR Section 3.4.2

{3. BBNPP FSAR Section 2.4.1.1}

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA4

Initiating Condition:

FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. FIRE or EXPLOSION resulting in **EITHER** of the following:
   - VISIBLE DAMAGE to **ANY** structures in **Table H-1** areas containing safety systems or components.
   - Control Room indication of degraded performance of those safety systems.

Table H-1: Safe Shutdown Vital Areas
• Control Room • Safeguards Buildings • Containment • Nuclear Auxiliary Building • Emergency Power Generating Buildings • ESWS Cooling Towers

Basis:

Generic

VISIBLE DAMAGE is used to identify the magnitude of the FIRE or EXPLOSION and to discriminate against minor FIRES and EXPLOSIONS.

The reference to structures containing safety systems or components is included to discriminate against FIRES or EXPLOSIONS in areas having a low probability of affecting safe operation. The significance here is not that a safety system was degraded but the fact that the FIRE or EXPLOSION was large enough to cause damage to these systems.

The use of VISIBLE DAMAGE should not be interpreted as mandating a lengthy damage assessment prior to classification. The declaration of an Alert and the activation of the Technical Support Center will provide the Emergency Director with the resources needed to perform detailed damage assessments.

The Emergency Director also needs to consider any security aspects of the EXPLOSION.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA4 (continued)

This EAL should specify site (U.S. EPR) specific structures or areas that contain safety system, or component and functions required for safe shutdown of the plant. Site specific Safe Shutdown Analysis should be consulted for equipment and plant areas required to establish or maintain safe shutdown.

<u>Site (U.S. EPR) Specific</u>

A steam line break or steam explosion that damages permanent structures or equipment in one of these areas would be classified under this EAL.

Basis Reference(s):

1. NEI 99-01, Rev 5 HA2

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU4

Initiating Condition:

FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. FIRE not extinguished within **15 minutes** of Control Room notification or verification of a Control Room FIRE alarm in actual contact with or immediately adjacent to **ANY** of the **Table H-1** areas.

   OR

2. EXPLOSION within the PROTECTED AREA.

Table H-1: Safe Shutdown Vital Areas
• Control Room • Safeguards Buildings • Containment • Nuclear Auxiliary Building • Emergency Power Generating Buildings • ESWS Cooling Towers

Basis:

Generic

This EAL addresses the magnitude and extent of FIRES or EXPLOSIONS that may be potentially significant precursors of damage to safety systems. It addresses the FIRE / EXPLOSION, and not the degradation in performance of affected systems that may result.

As used here, detection is visual observation and report by plant personnel or sensor alarm indication.

EAL #1

The 15 minute time period begins with a credible notification that a FIRE is occurring, or indication of a fire detection system alarm/actuation. Verification of a fire detection system alarm/actuation includes actions that can be taken within the control room or other nearby site specific location to ensure that it is not spurious. An alarm is assumed to be an indication of a FIRE unless it is disproved within the 15 minute period by personnel dispatched to the scene. In other words, a personnel report from the scene may be used to disprove a sensor alarm if received within 15 minutes of the alarm, but shall not be required to verify the alarm.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU4 (continued)

The intent of this 15 minute duration is to size the FIRE and to discriminate against small FIRES that are readily extinguished (e.g., smoldering waste paper basket).

The site specific list should be limited and applies to buildings and areas in actual contact with or immediately adjacent to VITAL AREAS or other significant buildings or areas. The intent of this IC is not to include buildings (i.e., warehouses) or areas that are not in actual contact with or immediately adjacent to VITAL AREAS. This excludes FIRES within administration buildings, waste-basket FIRES, and other small FIRES of no safety consequence. Immediately adjacent implies that the area immediately adjacent contains or may contain equipment or cabling that could impact equipment located in VITAL AREAS or the fire could damage equipment inside VITAL AREAS or that precludes access to VITAL AREAS.

EAL #2

This EAL addresses only those EXPLOSIONS of sufficient force to damage permanent structures or equipment within the PROTECTED AREA.

No attempt is made to assess the actual magnitude of the damage. The occurrence of the EXPLOSION is sufficient for declaration.

The Emergency director also needs to consider any security aspects of the EXPLOSION, if applicable.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HU2

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA5

Initiating Condition:

Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize the ability to safely operate or shutdown the reactor.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize the ability to safely operate or shutdown the reactor.

Basis:

Generic

Gases in a VITAL AREA can affect the ability to safely operate or safely shutdown the reactor.

The fact that SCBA may be worn does not eliminate the need to declare the event.

Declaration should not be delayed for confirmation from atmospheric testing if the atmosphere poses an immediate threat to life and health or an immediate threat of severe exposure to gases. This could be based upon documented analysis, indication of personal ill effects from exposure, or operating experience with the hazards.

If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.

An asphyxiant is a gas capable of reducing the level of oxygen in the body to dangerous levels. Most commonly, asphyxiants work by merely displacing air in an enclosed environment. This reduces the concentration of oxygen below the normal level of around 19%, which can lead to breathing difficulties, unconsciousness or even death.

An uncontrolled release of flammable gasses within a facility structure has the potential to affect safe operation of the plant by limiting either operator or equipment operations due to the potential for ignition and resulting equipment damage/personnel injury. Flammable gasses, such as hydrogen and acetylene, are routinely used to maintain plant systems (hydrogen) or to repair equipment/components (acetylene - used in welding). This EAL assumes concentrations of flammable gasses which can ignite/support combustion.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HA3

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU5

Initiating Condition:

Release of toxic, corrosive, asphyxiant or flammable gases deemed detrimental to NORMAL PLANT OPERATIONS.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EALs:

1. Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect NORMAL PLANT OPERATIONS.

   OR

2. Report by local, county or state officials for evacuation or sheltering of site personnel based on an offsite event.

Basis:

Generic

This EAL is based on the release of toxic, corrosive, asphyxiant or flammable gases of sufficient quantity to affect NORMAL PLANT OPERATIONS.

The fact that SCBA may be worn does not eliminate the need to declare the event.

This IC is not intended to require significant assessment or quantification. It assumes an uncontrolled process that has the potential to affect plant operations. This would preclude small or incidental releases, or releases that do not impact structures needed for plant operation.

An asphyxiant is a gas capable of reducing the level of oxygen in the body to dangerous levels. Most commonly, asphyxiants work by merely displacing air in an enclosed environment. This reduces the concentration of oxygen below the normal level of around 19%, which can lead to breathing difficulties, unconsciousness or even death.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HU3

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HG6

Initiating Condition:

Other conditions exist which in the judgment of the Emergency Director warrant declaration of a General Emergency.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EAL Threshold Value:

1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Basis:

Generic

This EAL addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for General Emergency.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HG2
2. EPA-400, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS6

Initiating Condition:

Other conditions exist which in the judgment of the Emergency Director warrant declaration of a Site Area Emergency.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EAL Threshold Value:

1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or, 2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

Basis:

Generic

This EAL addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for Site Area Emergency.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HS3
2. EPA-400, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA6

Initiating Condition:

Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EAL Threshold Value:

1. Other conditions exist which in the judgment of the Emergency Director indicate that 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 EPA Protective Action Guideline exposure levels.

Basis:

Generic

This EAL addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Alert emergency classification level.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HA6
2. EPA-400, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU6

Initiating Condition:

Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Unusual Event.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

EAL Threshold Value:

1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress 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 offsite response or monitoring are expected unless further degradation of safety systems occurs.

Basis:

Generic

This EAL addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Unusual Event emergency classification level.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01, Rev 5 HU5

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SG1

Initiating Condition:

Prolonged loss of all offsite and all onsite AC power to emergency busses.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. a. Loss of **ALL** offsite and **ALL** onsite AC power to 31, 32, 33 and 34 BDA busses.

   AND

   b. **EITHER** of the following:

   - Restoration of at least one emergency bus within **2 hours** is not likely.
   - **{**Calculated Clad Temperature in **Region 4}**.

Basis:

Generic

Loss of all AC power to emergency busses compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power to emergency busses will lead to loss of fuel clad, RCS, and containment, thus warranting declaration of a General Emergency.

The hours to restore AC power can be based on a site blackout coping analysis performed in conformance with 10 CFR 50.63 and Regulatory Guide 1.155, "Station Blackout," as available. Appropriate allowance for off-site emergency response including evacuation of surrounding areas should be considered. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response.

This IC is specified to assure that in the unlikely event of a prolonged station blackout, timely recognition of the seriousness of the event occurs and that declaration of a General Emergency occurs as early as is appropriate, based on a reasonable assessment of the event trajectory.

The likelihood of restoring at least one emergency bus should be based on a realistic appraisal of the situation since a delay in an upgrade decision based on only a chance of mitigating the event could result in a loss of valuable time in preparing and implementing public protective actions.

In addition, under these conditions, fission product barrier monitoring capability may be degraded.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SG1 (continued)

<u>Site (U.S. EPR) Specific</u>

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SG1

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SS1

Initiating Condition:

Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. Loss of **ALL** offsite and **ALL** onsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.

Basis:

<u>Generic</u>

Loss of all AC power to emergency busses compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power to emergency busses will lead to loss of Fuel Clad, RCS, and Containment, thus this event can escalate to a General Emergency.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of off-site power.

<u>Site (U.S. EPR) Specific</u>

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SS1

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SA1

Initiating Condition:

AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. a. AC power to 31, 32, 33 and 34 BDA busses is reduced to a single source for **15 minutes** or longer.

   AND

   b. Any additional single failure will result in a loss of all AC power to 31, 32, 33 and 34 BDA busses.

Basis:

Generic

The condition indicated by this IC is the degradation of the off-site and on-site AC power systems such that any additional single failure would result in a station blackout. This condition could occur due to a loss of off-site power with a concurrent failure of all but one emergency generator to supply power to its emergency busses. Another related condition could be the loss of all off-site power and loss of on-site emergency generators with only one train of emergency busses being backfed from the unit main generator, or the loss of on-site emergency generators with only one train of emergency busses being backfed from off-site power.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of power.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SA5

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SU1

Initiating Condition:

Loss of all offsite AC power to emergency busses for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. Loss of **ALL** offsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.

Basis:

Generic

Prolonged loss of off-site AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete loss of AC power to emergency busses.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of off-site power.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SU1

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SS2

Initiating Condition:

Loss of vital DC power for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. **< 210 VDC** on the vital 31, 32, 33 and 34 BUC busses for **15 minutes** or longer.

Basis:

Generic

Loss of all DC power compromises ability to monitor and control plant safety functions. Prolonged loss of all DC power will cause core uncovering and loss of containment integrity when there is significant decay heat and sensible heat in the reactor system.

Site specific bus voltage should be based on the minimum bus voltage necessary for the operation of safety related equipment. This voltage value should incorporate a margin of at least 15 minutes of operation before the onset of inability to operate those loads. This voltage is usually near the minimum voltage selected when battery sizing is performed. Typically the value for the entire battery set is approximately 105 VDC. For a 60 cell string of batteries the cell voltage is typically 1.75 Volts per cell. For a 58 string battery set the minimum voltage is typically 1.81 Volts per cell.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Site (U.S. EPR) Specific

The U.S. EPR has a 250 VDC battery system, where the typical minimum voltage of 210 VDC (versus 105) is the appropriate threshold.

Basis Reference(s):

1. NEI 99-01 Rev 5, SS3
2. Technical Specification 3.8.4, DC Sources

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SG3

Initiating Condition:

Automatic trip and all manual actions failed to shutdown the reactor and indication of an extreme challenge to the ability to cool the core exists.

Operating Mode Applicability:

1, 2

EALs:

1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**.

   AND

   b. All manual actions failed to shutdown the reactor as indicated by reactor power **> 5%**.

   AND

   c. **EITHER** of the following have occurred:

   - **{**Calculated Clad Temperature in **Region 3 or higher}**
   - Loss of all four trains of Emergency Feedwater.

Basis:

Generic

Under these conditions, the reactor is producing more heat than the maximum decay heat load for which the safety systems are designed and efforts to bring the reactor subcritical are unsuccessful.

The reactor should be considered shutdown when it producing less heat than the maximum decay heat load for which the safety systems are designed (typically 3 to 5% power).

For PWRs, the extreme challenge to the ability to cool the core is intended to mean that the core exit temperatures are at or approaching 1200º F or that the reactor vessel water level is below the top of active fuel.

Another consideration is the inability to initially remove heat during the early stages of this sequence. For PWRs, if emergency feedwater flow is insufficient to remove the amount of heat required by design from at least one steam generator, an extreme challenge should be considered to exist.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SG3 (continued)

In the event either of these challenges exists at a time that the reactor has not been brought below the power associated with the safety system design a core melt sequence exists. In this situation, core degradation can occur rapidly. For this reason, the General Emergency declaration is intended to be anticipatory of the fission product barrier table declaration to permit maximum off-site intervention time.

Site (U.S. EPR) Specific

5% power is based on the combined capacity of all four trains of the Emergency Feedwater systems.

Basis Reference(s):

1. NEI 99-01 Rev 5, SG2
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SS3

Initiating Condition:

Automatic trip failed to shutdown the reactor and manual actions taken from the reactor control console failed to shutdown the reactor.

Operating Mode Applicability:

1, 2

EALs:

1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**.

   AND

   b. Manual actions taken at the reactor control console failed to shutdown the reactor as indicated by reactor power **> 5%**.

Basis:

Generic

Under these conditions, the reactor is producing more heat than the maximum decay heat load for which the safety systems are designed and efforts to bring the reactor subcritical are unsuccessful. A Site Area Emergency is warranted because conditions exist that lead to IMMINENT loss or potential loss of both fuel clad and RCS.

The reactor should be considered shutdown when it producing less heat than the maximum decay heat load for which the safety systems are designed (typically 3 to 5% power).

Manual scram (trip) actions taken at the reactor control console are any set of actions by the reactor operator(s) at which causes or should cause control rods to be rapidly inserted into the core and shuts down the reactor.

Manual scram (trip) actions are not considered successful if action away from the reactor control console is required to scram (trip) the reactor. This EAL is still applicable even if actions taken away from the reactor control console are successful in shutting the reactor down because the design limits of the fuel may have been exceeded or because of the gross failure of the Reactor Protection System to shutdown the plant.

Site (U.S. EPR) Specific

5% power is based on the combined capacity of all four trains of the Emergency Feedwater systems.

Basis Reference(s):

1. NEI 99-01 Rev 5, SS2
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SA3

Initiating Condition:

Automatic trip failed to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor.

Operating Mode Applicability:

1, 2

EALs:

1. a. An automatic reactor trip failed to shutdown the reactor as indicated by reactor power **> 5%**.

   AND

   b. Manual actions taken at the reactor control console successfully shutdown the reactor as indicated by reactor power **< 5%**.

Basis:

Generic

The reactor should be considered shutdown when it producing less heat than the maximum decay heat load for which the safety systems are designed (typically 3 to 5% power).

Manual scram (trip) actions taken at the reactor control console are any set of actions by the reactor operator(s) which causes or should cause control rods to be rapidly inserted into the core and shuts down the reactor.

If the manual scram (trip) switches/pushbuttons on the control room console panels are considered an automatic input into the Reactor Protection System, a failure to scram (trip) without any other automatic input would make this threshold applicable.

This condition indicates failure of the automatic protection system to scram (trip) the reactor. This condition is more than a potential degradation of a safety system in that a front line automatic protection system did not function in response to a plant transient. Thus the plant safety has been compromised because design limits of the fuel may have been exceeded. An Alert is indicated because conditions may exist that lead to potential loss of fuel clad or RCS and because of the failure of the Reactor Protection System to automatically shutdown the plant.

Site (U.S. EPR) Specific

5% power is based on the combined capacity of all four trains of the Emergency Feedwater systems.

Basis Reference(s):

1. NEI 99-01 Rev 5, SA2
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SU3

Initiating Condition:

Inadvertent criticality.

Operating Mode Applicability:

3, 4

EALs:

1. An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

Basis:

Generic

This IC addresses inadvertent criticality events. This IC indicates a potential degradation of the level of safety of the plant, warranting an Unusual Event classification. This IC excludes inadvertent criticalities that occur during planned reactivity changes associated with reactor startups (e.g., criticality earlier than estimated).

This condition can be identified using the startup rate monitor. The term “sustained“ is used in order to allow exclusion of expected short term positive startup rates from planned control rod movements (such as shutdown bank withdrawal). These short term positive startup rates are the result of the increase in neutron population due to subcritical multiplication.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SU8

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SS4

Initiating Condition:

Loss of all monitoring functions for 15 minutes or longer with a SIGNIFICANT TRANSIENT in progress.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. a. Loss of SICS for **15 minutes** or longer.

   AND

   b. Loss of PICS for **15 minutes** or longer.

   AND

   c. **ANY** of the following SIGNIFICANT TRANSIENTS are in progress:

   - Automatic runback **> 50%** thermal power
   - Electrical load rejection **> 50%** full electrical load
   - Reactor trip
   - MHSI actuation

Basis:

Generic

This IC is intended to recognize the threat to plant safety associated with the complete loss of capability of the control room staff to monitor plant response to a SIGNIFICANT TRANSIENT.

A Site Area Emergency is considered to exist if the control room staff cannot monitor safety functions needed for protection of the public while a significant transient is in progress.

Site specific indications needed to monitor safety functions necessary for protection of the public must include control room indications, computer generated indications and dedicated annunciation capability.

The specific indications should be those used to determine such functions as the ability to shut down the reactor, maintain the core cooled, to maintain the reactor coolant system intact, maintain the spent fuel cooled, and to maintain containment intact.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SS4 (continued)

Site (U.S. EPR) Specific

The U.S. EPR is designed to survive a full offsite load rejection and maintain onsite house loads. Although actions will automatically occur, the inability of the operators to verify proper response increases risk and justifies escalation of emergency classification. A 50% change in power/electrical load was chosen as a reasonable value (less than the design criteria, which will still be considered a substantial challenge to the systems) as the threshold criteria.

Basis Reference(s):

1. NEI 99-01 Rev 5, SS6

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SA4

Initiating Condition:

Loss of all monitoring functions for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. a. Loss of SICS for **15 minutes** or longer.

   AND

   b. Loss of PICS for **15 minutes** or longer.

Basis:

Generic

This IC is intended to recognize the difficulty associated with monitoring changing plant conditions without the use of the annunciation or indication equipment.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SA4

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SU4

Initiating Condition:

Degradation of monitoring functions for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. Loss of SICS for **15 minutes** or longer.

   OR

2. Loss of PICS for **15 minutes** or longer.

Basis:

<u>Generic</u>

This IC and its associated EAL are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment.

Recognition of the availability of computer based indication equipment is considered (e.g., SPDS, plant computer, etc.).

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

<u>Site (U.S. EPR) Specific</u>

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SU3

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SU5

Initiating Condition:

Inability to reach required operating mode within Technical Specification limits.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. Plant is not brought to required operating mode within Technical Specifications LCO action completion time.

Basis:

Generic

Limiting Conditions of Operation (LCOs) require the plant to be brought to a required operating mode when the Technical Specification required configuration cannot be restored. Depending on the circumstances, this may or may not be an emergency or precursor to a more severe condition. In any case, the initiation of plant shutdown required by the site Technical Specifications requires a four hour report under 10 CFR 50.72 (b) Non-emergency events.

The plant is within its safety envelope when being shut down within the allowable action statement time in the Technical Specifications. An immediate Unusual Event is required when the plant is not brought to the required operating mode within the allowable action statement time in the Technical Specifications. Declaration of an Unusual Event is based on the time at which the LCO-specified action statement time period elapses under the site Technical Specifications and is not related to how long a condition may have existed.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SS2

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SU6

Initiating Condition:

Loss of all onsite or offsite communications capabilities.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. Loss of **ALL** of the following onsite communication methods affecting the ability to perform routine operations:
    - {Radios}
    - {Plant Page}
    - {Internal Telephone Systems}

    OR

2. Loss of **ALL** of the following offsite communications methods affecting the ability to perform offsite notifications:
    - {Dedicated Offsite Conference Lines}
    - {Telecopy Transmittal}
    - NRC Emergency Notification System - ENS
    - NRC Health Physics Network - HPN
    - {External Telephone Systems}

Basis:

Generic

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate issues with off-site authorities.

The loss of off-site communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

The availability of one method of ordinary off-site communications is sufficient to inform federal, state, and local authorities of plant problems. This EAL is intended to be used only when extraordinary means (e.g., relaying of information from non-routine radio transmissions, individuals being sent to off-site locations, etc.) are being used to make communications possible.

Site specific list for on-site communications loss must encompass the loss of all means of communications (e.g., commercial telephones, sound powered phone systems, page party system (Gaitronics) and radios / walkie talkies) routinely used for operations.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SU6 (continued)

Site specific list for off-site communications loss must encompass the loss of all means of communications with off-site authorities. This should include the ENS, commercial telephone lines, telecopy transmissions, and dedicated phone systems that are routinely used for offsite emergency notifications.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SU6

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SU7

Initiating Condition:

RCS leakage.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. Unidentified or pressure boundary leakage **> 10 gpm**.

   OR

2. Identified leakage **> 25 gpm**.

Basis:

Generic

This IC is included as an Unusual Event because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. The 10 gpm value for the unidentified or pressure boundary leakage was selected as it is observable with normal control room indications. Lesser values must generally be determined through time-consuming surveillance tests (e.g., mass balances).

Relief valve normal operation should be excluded from this IC. However, a relief valve that operates and fails to close per design should be considered applicable to this IC if the relief valve cannot be isolated.

The EAL for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, SU5

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - HOT

SU9

Initiating Condition:

Fuel clad degradation.

Operating Mode Applicability:

1, 2, 3, 4

EALs:

1. Gross Failed Fuel Monitor ({KUA66 CR001}) **> {SU9.1} cpm**.

   OR

2. Coolant sample activity **> 1.0 µCi/gm** dose equivalent I-131.

Basis:

Generic

This EAL is included because it is a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant.

EAL #1

This threshold addresses site-specific radiation monitor readings that provide indication of a degradation of fuel clad integrity.

EAL #2

This threshold addresses coolant samples exceeding coolant technical specifications for transient iodine spiking limits.

Site (U.S. EPR) Specific

EAL #1

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, SU4
2. Technical Specifications 3.4.15, RCS Specific Activity

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CA1

Initiating Condition:

Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer.

Operating Mode Applicability:

5, 6, D

EALs:

1. Loss of all offsite and all onsite AC power to 31, 32, 33 and 34 BDA busses for **15 minutes** or longer.

Basis:

Generic

Loss of all AC power compromises all plant safety systems requiring electric power including Residual Heat Removal, ECCS, Containment Heat Removal, Spent Fuel Heat Removal and the Ultimate Heat Sink.

The event can be classified as an Alert when in cold shutdown, refueling, or defueled mode because of the significantly reduced decay heat and lower temperature and pressure, increasing the time to restore one of the emergency busses, relative to that specified for the Site Area Emergency EAL.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, CA3

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU1

Initiating Condition:

AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses.

Operating Mode Applicability:

5, 6

EALs:

1. a. AC power to 31, 32, 33 and 34 BDA busses is reduced to a single source for **15 minutes** or longer.

   AND

   b. Any additional single failure will result in a loss of all AC power to 31, 32, 33 and 34 BDA busses.

Basis:

Generic

The condition indicated by this IC is the degradation of the off-site and on-site AC power systems such that any additional single failure would result in a station blackout. This condition could occur due to a loss of off-site power with a concurrent failure of all but one emergency generator to supply power to its emergency busses.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of power.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, CU3

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU2

Initiating Condition:

Loss of required DC power for 15 minutes or longer.

Operating Mode Applicability:

5, 6

EALs:

1. **< 210 VDC** on the required 31, 32, 33 and 34 BUC busses for **15 minutes** or longer.

Basis:

Generic

The purpose of this IC and its associated EAL is to recognize a loss of DC power compromising the ability to monitor and control the removal of decay heat during Cold Shutdown or Refueling operations.

Plants will routinely perform maintenance on a Train related basis during shutdown periods. It is intended that the loss of the operating (operable) train is to be considered.

Site specific bus voltage should be based on the minimum bus voltage necessary for the operation of safety related equipment. This voltage value should incorporate a margin of at least 15 minutes of operation before the onset of inability to operate those loads. This voltage is usually near the minimum voltage selected when battery sizing is performed. Typically the value for the entire battery set is approximately 105 VDC. For a 60 cell string of batteries the cell voltage is typically 1.75 Volts per cell. For a 58 string battery set the minimum voltage is typically 1.81 Volts per cell.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Site (U.S. EPR) Specific

The U.S. EPR has a 250 VDC battery system, where the typical minimum voltage of 210 VDC (versus 105) is the appropriate threshold.

Basis Reference(s):

1. NEI 99-01 Rev 5, CU7
2. Technical Specification 3.8.4, DC Sources

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU3

Initiating Condition:

Inadvertent criticality.

Operating Mode Applicability:

5, 6

EALs:

1. An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

Basis:

Generic

This IC addresses criticality events that occur in Cold Shutdown or Refueling modes (NUREG 1449, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States) such as fuel mis-loading events and inadvertent dilution events. This IC indicates a potential degradation of the level of safety of the plant, warranting an Unusual Event emergency classification level.

This condition can be identified using the startup rate monitor. The term “sustained“ is used in order to allow exclusion of expected short term positive startup rates from planned fuel bundle or control rod movements during core alteration. These short term positive startup rates are the result of the increase in neutron population due to subcritical multiplication.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, CU8

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU6

Initiating Condition:

Loss of all onsite or offsite communications capabilities.

Operating Mode Applicability:

5, 6, D

EALs:

1. Loss of **ALL** of the following onsite communication methods affecting the ability to perform routine operations:
   - {Radios}
   - {Plant Page}
   - {Internal Telephone Systems}

   OR

2. Loss of **ALL** of the following offsite communications methods affecting the ability to perform offsite notifications:
   - {Dedicated Offsite Conference Lines}
   - {Telecopy Transmittal}
   - NRC Emergency Notification System - ENS
   - NRC Health Physics Network - HPN
   - {External Telephone Systems}

Basis:

<u>Generic</u>

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate issues with off-site authorities.

The loss of off-site communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

The availability of one method of ordinary off-site communications is sufficient to inform federal, state, and local authorities of plant problems. This EAL is intended to be used only when extraordinary means (e.g., relaying of information from non-routine radio transmissions, individuals being sent to off-site locations, etc.) are being used to make communications possible.

Site specific list for on-site communications loss must encompass the loss of all means of communications (e.g., commercial telephones, sound powered phone systems, page party system (Gaitronics) and radios / walkie talkies) routinely used for operations.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU6 (continued)

Site specific list for off-site communications loss must encompass the loss of all means of communications with off-site authorities. This should include the ENS, commercial telephone lines, telecopy transmissions, and dedicated phone systems that are routinely used for offsite emergency notifications.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, CU6

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CG7

Initiating Condition:

Loss of RPV inventory affecting fuel clad integrity with containment challenged.

Operating Mode Applicability:

5, 6

EALs:

1. a. RPV level **< {96.0 feet (29.3 meters)}** (top of active fuel) for **30 minutes** or longer.

   AND

   b. **ANY Table C-1** containment challenge indications.

   OR

2. a. RPV level cannot be monitored with core uncovery indicated by **ANY** of the following for **30 minutes** or longer:

   - Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) **> {CG7.2.a(b1)} mR/hr**.
   - Erratic source range monitor indication.
   - UNPLANNED level rise in IRWST.

   AND

   b. **ANY Table C-1** containment challenge indications.

Table C-1: Containment Challenge Indications
• CONTAINMENT CLOSURE not established.
• Hydrogen concentration > 4% inside containment.
• UNPLANNED rise in containment pressure.

Basis:

Generic

This IC represents the inability to restore and maintain RPV level to above the top of active fuel with containment challenged. Fuel damage is probable if RPV level cannot be restored, as available decay heat will cause boiling, further reducing the RPV level. With the CONTAINMENT breached or challenged then the potential for unmonitored fission product release to the environment is high. This represents a direct path for radioactive inventory to be released to the environment. This is consistent with the definition of a GE. The GE is declared on the occurrence of the loss or IMMINENT loss of function of all three barriers.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CG7 (continued)

These EALs are based on concerns raised by Generic Letter 88-17, Loss of Decay Heat Removal, SECY 91-283, Evaluation of Shutdown and Low Power Risk Issues, NUREG-1449, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States, and, NUMARC 91-06, Guidelines for Industry Actions to Assess Shutdown Management.

<u>EAL #1</u>

A number of variables can have a significant impact on heat removal capability challenging the fuel clad barrier. Examples include; mid-loop, reduced level/flange level, head in place, cavity flooded, RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining.

Analysis indicates that core damage may occur within an hour following continued core uncovery therefore, 30 minutes was conservatively chosen.

If CONTAINMENT CLOSURE is re-established prior to exceeding the 30 minute core uncovery time limit then escalation to GE would not occur.

Site shutdown contingency plans typically provide for re-establishing CONTAINMENT CLOSURE following a loss of heat removal or RCS inventory functions.

In the early stages of a core uncovery event, it is unlikely that hydrogen buildup due to a core uncovery could result in an explosive mixture of dissolved gasses in Containment. However, Containment monitoring and/or sampling should be performed to verify this assumption and a General Emergency declared if it is determined that an explosive mixture exists.

<u>EAL #2</u>

Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

In the cold shutdown mode, normal RCS level and RPV level instrumentation systems will usually be available. In the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will usually be installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

As water level in the RPV lowers, the dose rate above the core will increase. The dose rate due to this core shine should result in site specific monitor indication and possible alarm.

This EAL should conservatively estimate a site specific dose rate setpoint indicative of core uncovery (i.e., level at TOAF).

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CG7 (continued)

Post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered and that this should be used as a tool for making such determinations.

Site (U.S. EPR) Specific

EAL #1

Top of Active Fuel (TOAF) cannot be read by installed level instrumentation in cold modes. {TOAF corresponds to plant elevation 96.0 feet (29.3 meters)}

EAL #2

U.S. EPR design does not have a Containment Building Sump. The IRWST is the point of drainage.

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, CG1
2. {TS, CALC, procedure or drawing references}

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CS7

Initiating Condition:

Loss of RPV inventory affecting core decay heat removal capability.

Operating Mode Applicability:

5, 6

EALs:

1. a. CONTAINMENT CLOSURE not established.

   AND

   b. Loss of RPV inventory as indicated by RCS level ({JEF10 CL081}) **< {CS7.1.b}**.

   OR

2. a. CONTAINMENT CLOSURE established.

   AND

   b. RPV level **< {96.0 feet (29.3 meters)}** (top of active fuel).

   OR

3. a. RCS level cannot be monitored for **30 minutes** or longer.

   AND

   b. Loss of RPV inventory as indicated by any of the following:

   - Reactor Building Refueling Bridge Area Dose Rate Monitor ({JYK15 CR003}) **> {CS7.3.b(b1)} mR/hr**.
   - Erratic source range monitor indication.
   - UNPLANNED level rise in IRWST.

Basis:

Generic

Under the conditions specified by this IC, continued decrease in RCS/RPV level is indicative of a loss of inventory control. Inventory loss may be due to an RCS breach, pressure boundary leakage, or continued boiling in the RPV. Thus, declaration of a Site Area Emergency is warranted.

EAL #1

6” below the bottom ID of the RCS Loop should be the level equal to 6” below the bottom of the RPV loop penetration (not the low point of the loop). PWRs unable to measure this level should choose the first observable point below the bottom ID of the loop as the EAL value. If a water level instrument is not available such that the PWR EAL value cannot be determined, then EAL 3 should be used to determine if the IC has been met.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CS7 (continued)

EAL #3

In the cold shutdown mode, normal RCS level and RPV level instrumentation systems will usually be available. In the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will usually be installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

The 30-minute duration allows sufficient time for actions to be performed to recover inventory control equipment.

As water level in the RPV lowers, the dose rate above the core will increase. The dose rate due to this core shine should result in site specific monitor indication and possible alarm.

This EAL should conservatively estimate a site specific dose rate setpoint indicative of core uncovery (i.e., level at TOAF).

Post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered and that this should be used as a tool for making such determinations.

Site (U.S. EPR) Specific

EAL #1

The lowest indicated reactor water level is the bottom of the reactor coolant hot legs {(Plant Elevation +101.9 feet (31.1 meters))}. A location 6” below the reactor coolant system hot legs would be {101.4 feet (30.9 meters)}.

EAL #2

Top of Active Fuel (TOAF) cannot be read by installed level instrumentation in cold modes. {TOAF corresponds to plant elevation 96.0 feet (29.3 meters)}

EAL #3

U.S. EPR design does not have a Containment Building Sump. The IRWST is the point of drainage.

{To be added to support EAL value/wording}

Basis Reference(s):

1. NEI 99-01 Rev 5, CS1
2. 02-DCD-JAA-1200A0-001
3. 02-DCD-PPY-JE-4001-000

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CA7

Initiating Condition:

Loss of RPV inventory.

Operating Mode Applicability:

5, 6

EALs:

1. Loss of RPV inventory as indicated by RCS level ({JEF10 CL081}) **< {CA7.1}**.

   OR

2. a. RCS level cannot be monitored for **15 minutes** or longer.

   AND

   b. Loss of RPV inventory as indicated by UNPLANNED level rise in IRWST.

Basis:

<u>Generic</u>

These EALs serve as precursors to a loss of ability to adequately cool the fuel. The magnitude of this loss of water indicates that makeup systems have not been effective and may not be capable of preventing further RPV level decrease and potential core uncovery. This condition will result in a minimum emergency classification level of an Alert.

<u>EAL #1</u>

The PWR Bottom ID of the RCS Loop setpoint was chosen because at this level remote RCS level indication may be lost and loss of suction to decay heat removal systems has occurred. The Bottom ID of the RCS Loop Setpoint should be the level equal to the bottom of the RPV loop penetration (not the low point of the loop).

The inability to restore and maintain level after reaching this setpoint would be indicative of a failure of the RCS barrier.

<u>EAL #2</u>

In the cold shutdown mode, normal RCS level and RPV level instrumentation systems will usually be available. In the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will usually be installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CA7 (continued)

The 15-minute duration for the loss of level indication was chosen because it is half of the CS1 Site Area Emergency EAL duration. Significant fuel damage is not expected to occur until the core has been uncovered for greater than 1 hour per the analysis referenced in the CG1 basis. Therefore this EAL meets the definition for an Alert.

Site (U.S. EPR) Specific

EAL #1

The lowest indicated reactor water level is the bottom of the reactor coolant hot legs {(Plant Elevation +101.9 feet (31.1 meters)}.

EAL #2

U.S. EPR design does not have a Containment Building Sump. The IRWST is the point of drainage.

Basis Reference(s):

1. NEI 99-01 Rev 5, CA1
2. 02-DCD-JAA-1200A0-001
3. 02-DCD-PPY-JE-4001-000

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU7

Initiating Condition:

RCS leakage.

Operating Mode Applicability:

5

EALs:

1. RCS leakage results in the inability to maintain or restore RCS level **> Procedure Established Minimum Level** for **15 minutes** or longer.

Basis:

Generic

This IC is considered to be a potential degradation of the level of safety of the plant. The inability to maintain or restore level is indicative of loss of RCS inventory.

Relief valve normal operation should be excluded from this IC. However, a relief valve that operates and fails to close per design should be considered applicable to this IC if the relief valve cannot be isolated.

The difference between CU7 and CU8 deals with the RCS conditions that exist between cold shutdown and refueling modes. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available.

Site (U.S. EPR) Specific

RCS level in the Cold Shutdown mode is controlled within limits that are established by procedures in effect for the present conditions. There are Cold Shutdown mode evolutions that are directed by procedures that require precise control and monitoring of RCS levels that include establishment of low level limits. Examples of such evolutions include draining down to vessel flange level to prepare for reactor head flange bolt de-tensioning, and draining to mid-loop for equipment maintenance. During these evolutions it is appropriate to use the low level limit established by the procedure in effect to determine if RCS leakage is occurring and emergency declaration is required.

Basis Reference(s):

1. NEI 99-01, Rev. 5 CU1

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU8

Initiating Condition:

UNPLANNED loss of RCS inventory.

Operating Mode Applicability:

6

EALs:

1. a. UNPLANNED RCS level drop below the RPV flange for **15 minutes** or longer when the RCS level band is established above the RPV flange.

   OR

   b. UNPLANNED RCS level drop **< Procedure Established Minimum Level** for **15 minutes** or longer when the RCS level band is established below the RPV flange.

   OR

2. a. RCS level cannot be monitored.

   AND

   b. Loss of RPV inventory as indicated by UNPLANNED rise in IRWST.

Basis:

__Generic__

This IC is a precursor of more serious conditions and considered to be a potential degradation of the level of safety of the plant.

Refueling evolutions that decrease RCS water level below the RPV flange are carefully planned and procedurally controlled. An UNPLANNED event that results in water level decreasing below the RPV flange, or below the planned RCS water level for the given evolution (if the planned RCS water level is already below the RPV flange), warrants declaration of an Unusual Event due to the reduced RCS inventory that is available to keep the core covered.

The allowance of 15 minutes was chosen because it is reasonable to assume that level can be restored within this time frame using one or more of the redundant means of refill that should be available. If level cannot be restored in this time frame then it may indicate a more serious condition exists.

The difference between CU7 and CU8 deals with the RCS conditions that exist between cold shutdown and refueling modes. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU8 (continued)

EAL #1

This EAL involves a decrease in RCS level below the top of the RPV flange that continues for 15 minutes due to an UNPLANNED event. This EAL is not applicable to decreases in flooded reactor cavity level, which is addressed by RU2.1 until such time as the level decreases to the level of the vessel flange.

EAL #2

This EAL addresses conditions in the refueling mode when normal means of core temperature indication and RCS level indication may not be available. Redundant means of RPV level indication will normally be installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

Site (U.S. EPR) Specific

U.S. EPR design does not have a Containment Building Sump. The IRWST is the point of drainage.

Basis Reference(s):

1. NEI 99-01 Rev 5, CU2

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CA10

Initiating Condition:

Inability to maintain plant in cold shutdown.

Operating Mode Applicability:

5, 6

EALs:

1. RCS temperature **> 200° F** for the specified duration on **Table C-2**.

Table C-2: RCS Reheat Duration Thresholds		
RCS	**Containment Closure**	**Duration**
Intact with Full RCS Inventory	N/A	> 60 minutes*
Not Intact OR Reduced RCS Inventory	Established	> 20 minutes*
	Not Established	0 minutes

* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, then this EAL is not applicable.

OR

2. RCS pressure rise **> 10 psig** due to a loss of RCS cooling (this EAL does not apply in solid plant conditions).

Basis:

<u>Generic</u>

For PWRs, this IC and its associated EALs are based on concerns raised by Generic Letter 88-17, "Loss of Decay Heat Removal." A number of phenomena such as pressurization, vortexing, RCS level differences when operating at a mid-loop condition, decay heat removal system design, and level instrumentation problems can lead to conditions where decay heat removal is lost and core uncovery can occur. NRC analyses show that there are sequences that can cause core uncovery in 15 to 20 minutes and severe core damage within an hour after decay heat removal is lost.

A loss of Technical Specification components alone is not intended to constitute an Alert. The same is true of a momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when the heat removal function is available.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CA10 (continued)

EAL #1

The RCS Reheat Duration Threshold table addresses complete loss of functions required for core cooling for greater than 60 minutes during refueling and cold shutdown modes when RCS integrity is established. RCS should be considered intact when the RCS pressure boundary is established (e.g., no freeze seals, nozzle dams installed or SG manways removed). The status of CONTAINMENT CLOSURE in this condition is immaterial given that the RCS is providing a high pressure barrier to fission product release to the environment. The 60 minute time frame should allow sufficient time to restore cooling without there being a substantial degradation in plant safety.

The RCS Reheat Duration Threshold table also addresses the complete loss of functions required for core cooling for greater than 20 minutes during refueling and cold shutdown modes when CONTAINMENT CLOSURE is established but RCS integrity is not established or RCS inventory is reduced (e.g. mid-loop operation). As discussed above, RCS should be assumed to be intact when the RCS pressure boundary is established (e.g., no freeze seals, nozzle dams installed or SG manways removed). The allowed 20 minute time frame was included to allow operator action to restore the heat removal function, if possible. The allowed time frame is consistent with the guidance provided by Generic Letter 88-17, "Loss of Decay Heat Removal" (discussed later in this basis) and is believed to be conservative given that a low pressure Containment barrier to fission product release is established.

Finally, complete loss of functions required for core cooling during refueling and cold shutdown modes when neither CONTAINMENT CLOSURE is established nor RCS is intact. RCS is intact when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). No delay time is allowed because the evaporated reactor coolant that may be released into the Containment during this heatup condition could also be directly released to the environment.

The note (*) indicates that this EAL is not applicable if actions are successful in restoring an RCS heat removal system to operation and RCS temperature is being reduced within the specified time frame.

EAL #2

The 10 psi pressure increase addresses situations where, due to high decay heat loads, the time provided to restore temperature control, should be less than 60 minutes. The RCS pressure setpoint chosen should be 10 psi or the lowest pressure that the site can read on installed Control Board instrumentation that is equal to or greater than 10 psi.

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, CA4
2. Technical Specifications Section 1.0 Table 1.1-1, Modes

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU10

Initiating Condition:

UNPLANNED loss of decay heat removal capability.

Operating Mode Applicability:

5, 6

EALs:

1. RCS temperature **> 200°** F due to an UNPLANNED loss of decay heat removal capability.

   OR

2. Loss of **ALL** RCS temperature and RCS level indication for **15 minutes** or longer.

Basis:

Generic

This IC is be a precursor of more serious conditions and, as a result, is considered to be a potential degradation of the level of safety of the plant. In cold shutdown the ability to remove decay heat relies primarily on forced cooling flow. Operation of the systems that provide this forced cooling may be jeopardized due to the unlikely loss of electrical power or RCS inventory. Since the RCS usually remains intact in the cold shutdown mode a large inventory of water is available to keep the core covered.

Entry into cold shutdown conditions may be attained within hours of operating at power. Entry into the refueling mode procedurally may not occur for typically 100 hours (site specific) or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). In addition, the operators should be able to monitor RCS temperature and RPV level so that escalation to the alert level will occur if required.

During refueling the level in the RPV will normally be maintained above the RPV flange. Refueling evolutions that decrease water level below the RPV flange are carefully planned and procedurally controlled. Loss of forced decay heat removal at reduced inventory may result in more rapid increases in RCS/RPV temperatures depending on the time since shutdown.

Unlike the cold shutdown mode normal means of core temperature indication and RCS level indication may not be available in the refueling mode. Redundant means of RPV level indication are therefore procedurally installed to assure that the ability to monitor level will not be interrupted. However, if all level and temperature indication were to be lost in either the cold shutdown of refueling modes, EAL 2 would result in declaration of an Unusual Event if both temperature and level indication cannot be restored within 15 minutes from the loss of both means of indication.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS - COLD

CU10 (continued)

Site (U.S. EPR) Specific

None

Basis Reference(s):

1. NEI 99-01 Rev 5, CU4
2. Technical Specifications Section 1.0 Table 1.1-1, Modes

<u>Enclosure D</u>

{Bell Bend Nuclear Power Plant}
State/Local Government Agreement Documentation

PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY

PENNSYLVANIA EMERGENCY
MANAGEMENT AGENCY
2605 Interstate Drive
Harrisburg, Pennsylvania 17110-9364

August 27, 2008

Mr. John Price
UniStar Nuclear Energy
Regulatory Affairs Coordinator
750 East Pratt Street
14th Floor
Baltimore, Maryland 21202

Reference: UniStar Nuclear Energy Services LLC and PPL Nuclear Development, LLC (PPL) Combined License (COL) Application

Dear Mr. Price:

The Pennsylvania Emergency Management Agency (PEMA) has received a copy of the proposed emergency plans for the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S Evolutionary Power Reactor for the Bell Bend Salem Township, Luzerne County, Pennsylvania location. The emergency plan has been reviewed by the Commonwealth of Pennsylvania, Department of Environmental Protection, Bureau of Radiation Protection (DEP/BRP). The attached letter from DEP/BRP indicates that based upon their review the proposed emergency plan is practicable. PEMA and the Emergency Preparedness Liaison Officers of State Departments and Agencies received a briefing provided by Mr. Terry Harpster on July 22, 2008, regarding the Bell Bend facility. The PEMA Bureau of Plans, Technological Hazards Division, has participated in meetings with Columbia and Luzerne Counties and the affected municipalities of Columbia County regarding Emergency Preparedness.

Given the fact that Emergency Plans currently exist for the Counties and Municipalities located within the approximate 10 mile radius Plume Exposure Pathway Emergency Planning Zone of the Susquehanna Steam Electric Station (SSES), it appears to be prudent from an emergency preparedness perspective that the proposed reactor be located adjacent to the SSES Units 1 and 2 in Salem Township, Pennsylvania. By virtue of Commonwealth law, PEMA is committed to participating in any further development of the emergency response plans, including any required field demonstrations and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities under the existing emergency response plans.

Based upon the input from DEP/BRP, PEMA agrees with the proposed emergency classification system, initiating conditions, and emergency action levels presented on July 8, 2008. It is my understanding that the specific Emergency Action Level (EAL), in support of emergency preparedness for operation of the proposed new nuclear unit, will be clearly established and discussed with DEP/BRP and PEMA, if and when UNES and PPL proceed with construction and operation of the new unit.

Should you have any questions or concerns, please contact Mr. Henry Tamanini, Planning Supervisor, Bureau of Plans, at 717-651-2723 or via email at hetamanini@state.pa.us.

Sincerely,

Robert P. French
Director

Enclosure

cc: Mr. David J. Allard, Department of Environmental Protection

Pennsylvania Department of Environmental Protection

Rachel Carson State Office Building
P.O. Box 8469
Harrisburg, PA 17105-8469
July 28, 2008

717-787-2814

Mr. John Price
UniStar Nuclear Energy
COL Application Coordinator
100 Constellation Way, Suite 1400P
Baltimore, MD 21202

Reference: UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) Combined License (COL) Application

Dear Mr. Price:

The Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection (PA DEP-BRP) certifies that the proposed emergency plans for the new U.S. Evolutionary Power Reactor to be located near the existing Susquehanna Steam Electric Station Units 1 and 2 are practicable. Additionally, we are committed to participating in any future development of the emergency response plans, including any required field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities under the existing emergency response plans.

Furthermore, the PA DEP-BRP agrees with the proposed emergency classification system, initiating conditions, and emergency action levels presented on July 8, 2008. It is my understanding that the specific EALs in support of emergency preparedness for operation of the proposed new nuclear unit will be clearly established and discussed with PA DEP-BRP should UNES and PPL proceed with construction and operation of the new unit.

Sincerely,

David J. Allard, CHP
Director
Bureau of Radiation Protection

cc: Robert P. French, Director, PEMA
Henry Tamanini, Program Supervisor, PEMA
Rich Janati, Chief, Nuclear Safety Division Chief, PA DEP-BRP
Marty Vyenielo, Chief, Emergency Response Section, PA DEP-BRP

Pennsylvania Department of Environmental Protection

Rachel Carson State Office Building
P.O. Box 8469
Harrisburg, PA 17105-8469
July 28, 2008

717-787-2814

Mr. John Price
UniStar Nuclear Energy
COL Application Coordinator
100 Constellation Way, Suite 1400P
Baltimore, MD 21202

Reference: UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) Combined License (COL) Application

Dear Mr. Price:

The Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection (PA DEP-BRP) certifies that the proposed emergency plans for the new U.S. Evolutionary Power Reactor to be located near the existing Susquehanna Steam Electric Station Units 1 and 2 are practicable. Additionally, we are committed to participating in any future development of the emergency response plans, including any required field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities under the existing emergency response plans.

Furthermore, the PA DEP-BRP agrees with the proposed emergency classification system, initiating conditions, and emergency action levels presented on July 8, 2008. It is my understanding that the specific EALs in support of emergency preparedness for operation of the proposed new nuclear unit will be clearly established and discussed with PA DEP-BRP should UNES and PPL proceed with construction and operation of the new unit.

Sincerely,

David J. Allard, CHP
Director
Bureau of Radiation Protection

cc: Robert P. French, Director, PEMA
Henry Tamanini, Program Supervisor, PEMA
Rich Janati, Chief, Nuclear Safety Division Chief, PA DEP-BRP
Marty Vyenielo, Chief, Emergency Response Section, PA DEP-BRP

Chris E. Young
William M. Soberick
David M. Kovach
Commissioners

Gail S. Kipp
Chief Clerk
Richard Knecht
Solicitor
Anthony McDonald
Asst. Solicitor

Commissioners of Columbia County

Court House, P.O. Box 380, Bloomsburg, Pennsylvania 17815
570-389-5600 (TDD: 570-389-5745) Fax: 570-784-0257

July 17, 2008

John Price
UniStar Nuclear Energy
Regulatory Affairs Coordinator
750 East Pratt Street
14th Floor
Baltimore, MD 21202

Reference: UniStar Nuclear Energy Services LLC and PPL Nuclear Development, LLC (PPL)
Combined License (COL) Application

Dear Mr. Price:

For the UniStar Nuclear Energy Services LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station Units 1 and 2 (SSES) in Salem Township, Pennsylvania, the Columbia County Emergency Management Agency certifies that the proposed emergency plans are practicable, is committed to participating in any further development of the emergency response plans, including any required field demonstrations, and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities under the existing emergency response plans in the event of an emergency.

Furthermore, Columbia County EMA agrees with the proposed emergency classification system, initiating conditions, and emergency action levels presented on July 2006. It is my understanding that the specific EALs in support of emergency preparedness for operation of the proposed new nuclear unit will be clearly established and discussed with Columbia County EMA if and when UNES and PPL proceeds with construction and operation of the new unit.

Sincerely,

Chris E. Young
Chairman
Columbia County Commissioners

COMMISSIONERS

MARYANNE C. PETRILLA, Chairman
GREGORY A. SKREPENAK
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DOUGLAS PAPE
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County Solicitor

ALAN M. PUGH, ENP
Chief of Public Safety

STEPHEN BEKANICH, CEM, CHMP
EMA Coordinator

COUNTY *of* LUZERNE

DEPARTMENT OF PUBLIC SAFETY
9-1-1 • EMERGENCY MANAGEMENT AGENCY • SECURITY

July 9, 2008

Mr. John Price
UniStar Nuclear Energy
Regulatory Affairs Coordinator
750 East Pratt Street
14th Floor
Baltimore, MD 21202

Ref: UniStar Nuclear Energy Services, LLC and PPL Nuclear Development, LLC Combined License (COL) Application

Dear Mr. Price,

Concerning the UniStar Nuclear Energy Services, LLC (UNES) and PPL Nuclear Development, LLC (PPL) proposed U.S. Evolutionary Power Reactor to be located adjacent to the Susquehanna Steam Electric Station (SSES) Units 1 and 2 in Salem Township, Pennsylvania; the Luzerne County Emergency Management Agency certifies that proposed emergency plans are practicable. The Luzerne County Emergency Management Agency is committed to participating in further development of the emergency response plans, including any required field demonstrations and will work with UNES and PPL to identify any needed changes to our current commitment to execute our responsibilities under the existing response plans in the event of an emergency.

Furthermore, on behalf of the Luzerne County Board of Commissioners, Luzerne County EMA agrees with the proposed emergency classification system, initiating conditions and Emergency Action Levels (EALs) presented on June 5, 2008. It is my understanding that the specific EALs in support of emergency preparedness for the operation of the proposed new nuclear unit will be clearly established and discussed with the Luzerne County Emergency Management Agency if and when UNES and PPL proceeds with construction and operation of the new unit.

Respectfully yours,

Stephen Bekanich

Stephen Bekanich, CEM, CHMP
Emergency Management Coordinator

CC: Commissioner Maryanne C. Petrilla, Chairman
Douglas Pape, County Manager/ Chief Clerk
Ron Remsky, Emergency Planner, PPL Susquehanna, LLC
James P. Blaum, ESQ., County Solicitor
Alan M. Pugh, ENP, Chief of Public Safety

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