

### 10 CFR 50 Appendix E

RS-06-053

April 10, 2006

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

Zion Nuclear Power Station, Units 1 and 2  
Facility Operating License Nos. DRP-39 and DPR-48  
NRC Docket Nos. 50-295 and 50-304

Subject: Changes to Emergency Plan and Emergency Plan Implementing Procedures

In accordance with the requirements of 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," Exelon Generation Company, LLC is submitting changes to the Defueled Station Emergency Plan and revisions to two Emergency Plan Implementing Procedures (EPIPs) for Zion Nuclear Power Station. The following EPIPs have been revised:

1. EPIP-07, "Calculation of Station Noble Gas Release Rate to Determine DSEP Classification"
2. EPIP-08, "Contaminated Injury Response"

Attachment 1 provides a summary of the changes to the DSEP and a summary of changes to the EPIPs listed above.

Attachment 2 provides Revision 8 of the DSEP.

Attachment 3 provides the revised EPIPs.

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Page 2

These changes were made in accordance with 10 CFR 50.54, "Conditions of licenses," paragraph (q). Revision 8 of the DSEP and the revised EIPs were implemented on March 13, 2005; therefore, this report is due to the NRC by April 12, 2006 (i.e., 30 days after implementation).

Please direct any questions regarding this letter to John L. Schrage at (630) 657-2821.

Respectfully,

A handwritten signature in cursive script that reads "Joseph A. Bauer". The signature is written in dark ink and is positioned above the printed name and title.

Joseph A. Bauer  
Manager, Licensing

Attachment 1: Summary of Changes

Attachment 2: Zion Nuclear Power Station DSEP, Revision 8

Attachment 3: Revised EIP Procedures, EIP-07 and EIP-08

**ATTACHMENT 1  
ZION NUCLEAR POWER STATION  
SUMMARY OF CHANGES**

**DEFUELED STATION EMERGENCY PLAN, REVISION 8  
EMERGENCY PLAN IMPLEMENTING PROCEDURES**

**ATTACHMENT 1  
ZION NUCLEAR POWER STATION  
SUMMARY OF CHANGES**

**Defueled Station Emergency Plan, Revision 8**

<b>DSEP Revision 7 Wording</b>	<b>DSEP Revision 8 Wording</b>
<p>Page 14</p> <p>HU6 (p. 32) Transportation of Radioactively Contaminated or Potentially Contaminated Person to an Offsite Medical Facility</p>	<p>Page 14</p> <p>Deleted</p> <p>The NRC endorsed removal of this EAL in Emergency Preparedness Position EPPOS-1. The basis for this deletion is that the event does not meet the threshold of the emergency class and is not a precursor to a more serious event.</p>
<p>Page 32</p> <p>HU6-Transportation of Radioactively Contaminated or Potentially Contaminated Person(s) to an Offsite Medical Facility.</p> <p>INITIATING CONDITION Transportation of Radioactively Contaminated or Potentially Contaminated Person(s) to an Offsite Medical Facility.</p> <p>EAL-THRESHOLD VALUE</p> <p>A radioactively contaminated injured person(s) is transferred to an offsite medical facility for treatment.</p> <p>BASIS: (References)</p> <p>This EAL insures that proper authorities are notified when a contaminated or potentially individual(s) is transported to an offsite medical facility. If it is uncertain that the individual is contaminated an UNUSUAL EVENT should be conservatively declared until proven otherwise.</p> <p>Termination/Recovery Considerations</p> <p>A determination is made that the individual(s) is no longer contaminated.</p>	<p>Page 32</p> <p>THIS PAGE INTENTIONALLY LEFT BLANK</p>

**ATTACHMENT 1  
ZION NUCLEAR POWER STATION  
SUMMARY OF CHANGES**

**Emergency Plan Implementing Procedures**

<b>EPIP-07, Revision 2 Wording</b>	<b>EPIP-07, Revision 3 Wording</b>
Page 1 of 10: Change a typographical error from GSEP to DSEP in section A of this procedure.	Page 1 of 10: Delete discussion of 1(2)RIA-PR49 Channels 7 and 9.  The changes to Emergency Plan Implementing Procedure EPIP-07 eliminate the discussion of Auxiliary Building Noble Gas Effluent SPING radiation Monitors 1(2)RIA-PR49, Channels 7 and 9. These SPING channels are high range noble gas detectors designed to quantify effluent releases during at power severe accident conditions. Zion Station is in a permanently defueled condition. Remaining accidents no longer require these channels to be operable. The SPING channels have been deleted from the Offsite Dose Calculation manual (ODCM).
Step G.1.1.1: If the available units 1(2)RIA-PR49 SPING is operable, channels 7 and 9 are NOT in High Alarm, and the channel 5 status is NORMAL, ALERT, Or HIGH ALARM, <u>Then</u> USE the channel 5 value on Attachment 1 as the stack(s) release concentration.	Step G.1.1.1: If the available units 1(2)RIA-PR49 SPING is operable, <u>Then</u> USE the channel 5 value on Attachment 1 as the stack(s) release concentration.
Step G.1.1.2: If a SPING(s) channel 7 or 9 is in HIGH ALARM, Then, use the applicable SPINGs channel 9 value on Attachment 1 as the stack(s) release concentration.	Step G.1.1.2 deleted
Step G.1.1.3.	Renumbered to G.1.1.2.
Attachment 1, Step 1.a: If SPING channel 5 is operable and channels 7 and 9 are NOT in High Alarm, <u>Then</u> document the applicable units release concentration using channel 5.	Attachment 1, Step 1.a: If SPING channel 5 is operable, <u>Then</u> document the applicable units release concentration using channel 5.
Attachment 1, Step 1.b: If the SPING(s) is operable AND channels 7 and 9 are in High Alarm, <u>Then</u> , document the applicable units release concentration using channel 9. At the SPING contril terminal, use the 'Hist Min' command to print the most recent one minute averages for each applicable channel 9. RECORD the highest reading for each applicable channel 9.  U1 Channel 9 reading _____ uCi/cc  U2 Channel 9 reading _____ uCi/cc	Attachment 1, Step 1.b deleted
Attachment 1, Step 1.c.	Renumbered to 1.b.

**ATTACHMENT 1  
ZION NUCLEAR POWER STATION  
SUMMARY OF CHANGES**

**Emergency Plan Implementing Procedures**

<b>EPIP-08, Revision 2 Wording</b>	<b>EPIP-08, Revision 3 Wording</b>
<p>Page 1 of 8</p> <ul style="list-style-type: none"> <li>Title changes and enhancements that add clarity to directions given.</li> <li>Editorial Change. Correct ZRP # 0n page 5 to read ZRP 5720-04.</li> </ul>	<p>Page 1 of 8</p> <p>Eliminate guidance associated with the declaration of an emergency classification per DSEP, Revision 8.</p> <p>The NRC endorsed removal of this EAL in Emergency Preparedness Position EPPOS-1. The basis for this deletion is that the event does not meet the threshold of the emergency class and is not a precursor to a more serious event.</p>
<p>Step C.3</p> <p>DSEP Section 5.0.</p>	<p>Step C.3</p> <p>DSEP Section 6.4.7.</p>
<p>Step G.3</p> <p>IF the injured individual is also contaminated AND requires transportation to an offsite facility for treatment, THEN evaluate the conditions for declaring an Emergency Classification per DSEP Section 5.0.</p>	<p>Step G.3 deleted</p>
<p>Step G.10a</p> <p>Upon the determination that an individual(s) is being transported to the hospital as a potentially contaminated victim the Shift Supervisor/Emergency Director should declare an Unusual Event and adhere to all appropriate procedures.</p>	<p>Step G.10a deleted</p>
<p>Step G.13</p> <p>Evaluate classification using DSEP Section 5.0.</p>	<p>Step G.13 deleted</p>
<p>Step G.14</p> <p>When conditions at the hospital no longer Radiation Protection support, the DSEP classification SHOULD be evaluated for termination.</p>	<p>Step G.14 deleted</p>
<p>Miscellaneous step numbering</p>	<p>Renumbered to reflect changes</p>

**ATTACHMENT 2**  
**ZION NUCLEAR POWER STATION**  
**DEFUELED STATION EMERGENCY PLAN, REVISION 8**

**March 13, 2006**

Revision 8



Zion Station

**Defueled  
Station Emergency Plan  
(DSEP)**



## DEFUELED STATION EMERGENCY PLAN

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## DEFUELED STATION EMERGENCY PLAN

### 1.0 INTRODUCTION

This Defueled Station Emergency Plan (DSEP) describes Exelon's plan for responding to emergencies that may arise at Zion Station while in a permanently shutdown and defueled configuration. In this condition, no reactor operations can take place. All irradiated fuel is stored in a Spent Fuel Pool and the station is prohibited from moving the fuel from the Spent Fuel Pool to the reactor vessel. An analysis of the possible design basis events and consequences is presented in the evaluation of the Defueled Safety Analysis Report (DSAR) Accident Assessment.

The analysis of the potential radiological impact of an accident for Zion Station in a permanently defueled condition indicates that any releases beyond the Restricted Area Boundary (RAB) are limited to small fractions of the Environmental Protection Agency (EPA) Protective Action Guide (PAG) exposure levels, as detailed in EPA-400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents." Exposure levels, which warrant pre-planned response measures, are limited to onsite areas. For this reason, radiological emergency planning is focused onsite.

In light of the substantially reduced risk and consequences of any potential incidents in a permanently shutdown and defueled condition, the overall purpose of the plan is to delineate the actions necessary to safeguard onsite personnel and minimize damage to property.

Emergency services are afforded by local public and private providers. Fire, rescue and ambulance services are provided by the City of Zion, Illinois. Medical services are provided by Victory Memorial Hospital in Waukegan, Illinois.

### 1.1 FACILITY DESCRIPTION

Both units are certified to have ceased power operations and are permanently defueled in accordance with 10CFR50.82(a)(1)(i) and (ii).

The Zion Station, Units 1 and 2, are sited on a tract of land of approximately 250 acres in the extreme eastern portion of the city of Zion, Lake County, Illinois, on the west shore of Lake Michigan. The site is approximately 6 miles NNE of the center of the city of Waukegan, Illinois and 8 miles south of the center of the city of Kenosha, Wisconsin. Lake Michigan and Zion City Water supply cooling water for the Station.

The plant consisted of two identical Pressurized Water Reactor (PWR) Nuclear Steam Supply Systems (NSSS) and turbine generators furnished by Westinghouse Electric Corporation, which contained Brown-Boveri low-pressure components. Each Nuclear Steam Supply System was designed for a power output of 3250 MWt.

All spent fuel from both units is stored in a Spent Fuel Pool (SFP). The SFP is a reinforced concrete structure with seam welded stainless steel plate liners. The borated SFP water is cooled via a closed loop cooling system and maintained in accordance with the Defueled Technical specification requirements. A complete description is provided in Section 3 of the Station DSAR.

For more specific site location information, refer to the Station DSAR.

## DEFUELED STATION EMERGENCY PLAN

### 2.0 DEFINITIONS AND ACRONYMS

#### ANNUAL

Frequency of occurrence equal to once per calendar year, January 1 to December 31.

#### ASSEMBLY/ACCOUNTABILITY

Discretionary protective action taken for all persons onsite that involves the gathering of personnel into pre-designated areas and the subsequent verification that the location of all personnel is known.

#### CLASSIFICATION

The process of observation of initiating conditions that relate to Emergency Action Levels (EALs) which determine severity.

#### DERO

Defueled Emergency Response Organization

#### DRILL

A supervised instruction period aimed at testing, developing and maintaining skills in a particular operation.

#### DSAR

Defueled Safety Analysis Report

#### DSEP

Defueled Station Emergency Plan

#### EMERGENCY ACTION LEVELS (EALs)

A pre-determined, observable threshold for a plant initiating condition that places the station in a given emergency class.

#### EMERGENCY DIRECTOR

The designated position described in the DSEP that assumes Command and Control responsibilities.

#### INITIATING CONDITION

A pre-determined condition where either an actual or potential radiological or other emergency exists.

#### MONTHLY

Frequency of occurrence equal to once per calendar month.

#### OFFSITE DOSE CALCULATION MANUAL (ODCM)

The ODCM presents a discussion of the following:

- The ways in which the station can affect the environment radiologically
- The regulations which limit radiological effluents; and
- The methodology used to assess radiological impact on the environment and compliance with regulations.

#### PROTECTIVE ACTIONS

Emergency measures taken for the purpose of preventing or minimizing radiological exposure to onsite workers.

## DEFUELED STATION EMERGENCY PLAN

### 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; and October 1 through December 31.

### RELEASE

For reporting purposes, whenever an event has been classified and a release in progress exceeds the ODCM release rate limits.

### SHIFT SUPERVISOR

The senior on shift operations position at the station.

### SPENT FUEL NUCLEAR ISLAND

An area containing spent fuel storage and fuel handling systems, which are capable of functioning independent of other existing plant systems, structures and components to support wet spent fuel storage in the Fuel Handling Building.

### THRESHOLD VALUE

Measurable, observable detailed conditions that must be satisfied to determine an EAL applicability.

### UNMONITORED RELEASE

Any abnormal release that cannot be quantified within 15 minutes.

## 3.0 PLAN SUMMARY

Section 1 provides a description of the overall basis for and concept of Zion Station and offsite emergency response.

Section 2 provides definitions and acronyms that may be used in emergency response.

Section 3 provides a section by section summary of the Defueled Station Emergency Plan (DSEP).

Section 4 describes the normal station organization, activation and transition to the station Emergency Response Organization (ERO).

Section 5 describes the emergency classification process and provides the Initiating Conditions (ICs) and Emergency Action Levels (EALs). Recovery and termination conditions are described.

Section 6 describes the emergency condition assessment actions, corrective actions, protective actions, and aid to affected personnel that would be used to mitigate the consequences of an incident. Also described is the notification of events and activation of the EROs.

Section 7 describes the emergency response capabilities including facilities, communications, equipment and first aid medical provisions.

Section 8 describes provisions for maintaining the DSEP, implementing procedures, equipment, training, drills, and exercises used to ensure that the Defueled ERO maintain familiarity with the required responses to emergencies.

## DEFUELED STATION EMERGENCY PLAN

### 4.0 ORGANIZATIONAL CONTROL OF EMERGENCIES

The Defueled Emergency Response Organization (DERO) replaces the normal station organization to respond to declared emergencies when activated. Personnel are trained and assigned to the DERO based on either their normal job qualifications or by being specifically trained to fill a position.

The DERO is activated when an Alert is declared or at the discretion of the Shift Supervisor for an Unusual Event. The on shift staff is supplemented by station personnel who report to the Control Room Complex after being notified. The Shift Supervisor is responsible for ensuring that a callout is initiated to augment the on shift staff.

The goal of the DERO is to augment the Control Room staff with a minimum augmented staff nominally in four-hours and a full staff nominally in four hours at an Alert classification. An on call duty team will be the augmented staff.

The Shift Supervisor assumes the responsibilities of the Emergency Director. The Shift Supervisor position is required to be staffed at all times. Additional personnel available to the shift are governed by approved Technical Specifications.

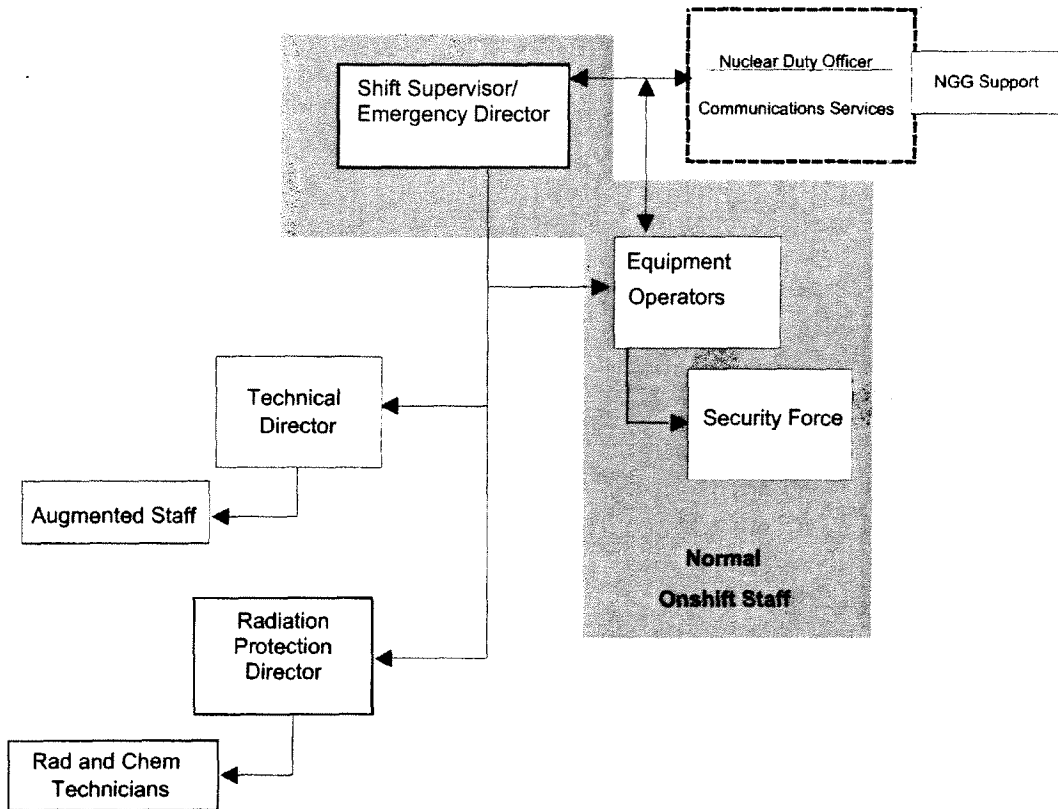
Minimum augmented staff is a Radiation Protection Director. Additional positions include a Technical Director as deemed necessary by the Emergency Director.

Augmenting the DERO is accomplished by the assignment of specific personnel to assist the DERO as needed. Operations, maintenance, radiation protection and engineering personnel shall be briefed and dispatched to assigned tasks from the Control Room. Exelon Nuclear Corporate and Station resources can supply augmentation of the staff and long-term shift relief.

The Nuclear Duty Officer (NDO) is notified when any event occurs including classifications. The Nuclear Duty Officer has the discretionary authority to activate the Corporate ERO if deemed necessary. Coordination with Senior Management and the Corporate Communications Duty Officer (media relations) is provided by the NDO as well as ANI and INPO notifications.

## DEFUELED STATION EMERGENCY PLAN

### DEFUELED EMERGENCY RESPONSE ORGANIZATION





## DEFUELED STATION EMERGENCY PLAN

### 4.1 ONSHIFT POSITIONS

The minimum on shift positions are governed by approved Technical Specifications.

#### 4.1.1 SHIFT SUPERVISOR

The Shift Supervisor is at the station 24 hours a day and is the senior management position at the station during off-hours. This position is responsible for monitoring conditions and approving all onsite activities. When an abnormal situation becomes apparent, the Shift Supervisor shall assume the position of Emergency Director with Command and Control once the emergency classification has been made.

#### 4.1.2 EQUIPMENT OPERATORS

Equipment Operators perform system and component manipulations. The organizational relationship to the Emergency Director is the same during normal and abnormal situations.

#### 4.1.3 RADIATION PROTECTION

Radiation Protection (RP) staff are available during normal day shift business hours. At all other times, Radiation Protection support is available on shift or through callout.

### 4.2 SUPPORT POSITIONS

#### 4.2.1 RADIATION PROTECTION (RPTs) AND CHEMISTRY TECHNICIANS (CTs)

Technicians perform radiological monitoring and surveys of plant areas and radioisotopic analysis of air and water samples. When an event is classified and the DSEP is implemented, the Technicians report to the Emergency Director to provide radiological and chemistry analysis support. Their responsibilities when implementing the DSEP include:

- Perform radiological monitoring and surveys as directed
- Ensure the habitability of the occupied areas of the plant
- Monitor personnel exposures
- Perform radioisotopic analysis as directed
- Provide radiological and first aid support to search and rescue and medical emergencies.
- Maintain a record of event activities and surveys performed

#### 4.2.2 SECURITY

Station Security is administered by the Security Plan. The Security force will report to the Emergency Director when implementing the DSEP.

### 4.3 AUGMENTED POSITIONS

The augmented staff shall be activated at an Alert classification. The augmented staff may be activated at the discretion of the Emergency Director for an Unusual Event.

## DEFUELED STATION EMERGENCY PLAN

### 4.3.1 EMERGENCY DIRECTOR

The Emergency Director shall assume overall Command and Control of a classified event. The Emergency Director cannot delegate the following responsibilities:

- Classification of event
- Authorize Corporate Nuclear Duty Officer (NDO), State and NRC notifications
- Authorization of radiation exposures in excess of 10CFR20 limits

Other responsibilities assumed by the Emergency Director include:

- Management of available station resources
- Initiate mitigative actions
- Initiate corrective actions
- Initiate onsite protective actions
- Decision to call for offsite police, fire or ambulance assistance
- Augment the emergency staff as deemed necessary
- Coordinate Security activities
- Implement recovery activities
- Terminate the emergency condition when appropriate
- Maintain a record of event activities

### 4.3.2 TECHNICAL DIRECTOR

The Technical Director reports to the Emergency Director. The responsibilities of the Technical Director when implementing the DSEP include:

- Evaluate technical data pertinent to plant conditions
- Augment the emergency staff as deemed necessary with maintenance, technical, engineering and communications personnel
- Assist with classification determination
- Supervise Communicators to maintain communications with the offsite ERO and the NRC when requested.
- Recommend mitigative and corrective actions
- Direct search and rescue
- Direct maintenance and equipment restoration
- Maintain a record of event activities
- Establish and maintain communications as desired by the Emergency Director
- Record significant events on the significant event log.
- Maintain Status Boards as desired by the Emergency Director

### 4.3.3 RADIATION PROTECTION DIRECTOR (minimum staff)

- Monitor personnel accumulated dose
- Advise the Emergency Director concerning Radiological EALs
- Augment the emergency staff as deemed necessary with Health Physics personnel
- Establish and monitor Radiologically Controlled Areas (RCAs)
- Dose Assessment
- Maintain a record of event activities
- Establish and maintain communications as desired by the Emergency Director
- Maintain Status Boards as desired by the Emergency Director
- Record significant events on the significant event log.

## DEFUELED STATION EMERGENCY PLAN

### 4.4 CORPORATE RESPONSE

Corporate response may be activated at the discretion of the Nuclear Duty Officer (NDO) and may assume the following responsibilities:

- Interface with the State and local agencies
- Offsite Dose Assessment/Projections
- Environmental Monitoring
- Management of available corporate resources
- Media relations / public information
- Maintain a record of event activities
- Augment the staff at Zion Station if deemed necessary.

### 4.5 FUNCTIONAL RESPONSIBILITIES

Plant Operations are monitored and supervised from the Control Room under the direction of the Emergency Director.

Onsite Radiological Survey and Monitoring is performed by the Radiation Protection Technicians (RPTs) under the direction of the Radiation Protection Director.

First Aid treatment is available at all times and is provided by trained personnel (Emergency Director) assigned to the shift or by RPTs when on shift.

Decontamination is performed by RPTs under the direction of the Radiation Protection Director.

Security and Access Control are performed by the Security Force per the Security Plan.

Maintenance, Repair and Damage Control are provided by personnel from the plant staff under the direction of the Technical Director.

Communications are the responsibility of the Emergency Director, are maintained at the ERFs and consist of telephone and radio equipment.

Record keeping is maintained through logs kept in the Control Room by all responders designated in Sections 4.3 and 4.4.

### 4.6 STATE AND LOCAL GOVERNMENT RESPONSE

State and local government agency response will be in accordance with each agency's plans and procedures, and commensurate with the hazard posed by the emergency. Letters of Agreement are in place for those local agencies that will respond to the site, and for the hospital that will treat a contaminated injured individual from the site.

Arrangements are in place through Letters-of-Agreement for police, fire, hospital and ambulance response as requested by the station.

## DEFUELED STATION EMERGENCY PLAN

### 5.0 CLASSIFICATION OF EMERGENCIES

This Section describes the classification of emergencies into two levels. They are the Unusual Event and Alert. These classification levels are entered by meeting the criteria of Emergency Action Levels (EALs) provided in this section as a combination of Initiating Conditions (ICs) and Threshold Values used to determine if the conditions meet the EAL.

The higher classifications required for operating nuclear power plants are exempted by the NRC for a permanently defueled facility once the determination is made that credible accident scenarios can no longer exceed the Protective Action Guidelines specified by the Environmental Protection Agency.

The Initiating Condition Matrix contains the ICs for the defueled plant. An emergency is classified by assessing plant conditions and comparing abnormal conditions to Initiating Conditions defined on the Initiating Condition Matrix.

The matrix is set up in three Recognition Categories. The first is designated as "R" and relates to Abnormal Radiological Conditions / Abnormal Radiological Effluent Releases. The second is designated as "M" and relates to System Malfunctions. The third is designated as "H" and relates to Hazards and Other Conditions. All Recognition Categories should be reviewed for applicability prior to classification.

The Initiating Conditions are coded with a two letter and one number code. The first letter is the Recognition Category designator, the second letter is the Classification Level and the number is a sequential number for that Recognition Category series. All Initiating Conditions that are describing the severity of a common condition (series) will have the same number.

The code is then used to reference a corresponding Threshold Value page(s) that provides additional information pertaining to the Initiating Condition;

- Threshold Value
- Basis
- Termination / Recovery Considerations.

Threshold Values are the measurable, observable detailed conditions that must be met in order to classify the event. Classification shall not be made without referencing, comparing and satisfying the Threshold Values. When the Threshold Value is met, the appropriate Emergency Action Level is to be classified. The Basis provides definitions of terms, explanations and justification for including the Initiating Condition and Threshold Values. Site specific definitions are provided for terms with the intent to be used for that particular Initiating Condition/Threshold Value and may not be applicable to other uses of that term in any other EAL, the DSEP or procedures. Also included are references to other documents that were used to develop the EAL. Termination/Recovery Considerations are to be used as a guide for determining when the Initiating Condition is no longer a threat.

When two or more Emergency Action Levels are determined, declaration will be made on the highest classification level for the plant.

A classification of Recovery is made when repairs are being made as required to return to an acceptable condition and parameters are stable or improving. Termination is declared when no EAL Threshold Values are exceeded and the DERO is no longer needed.

## DEFUELED STATION EMERGENCY PLAN

ALERT	UNUSUAL EVENT
<b>ABNORMAL RAD LEVELS / EFFLUENTS</b>	
<b>RA1 (p.15)</b> Release $\geq 10$ X the Technical Specification Release Limit for $\geq 15$ Minutes.	<b>RU1 (p.17)</b> Release $\geq 2$ X the Technical Specification Release Limit for $\geq 60$ Minutes.
	<b>RU2 (p.18)</b> Increased Rad Levels OR Airborne Concentrations.
<b>SYSTEM MALFUNCTIONS</b>	
<b>MA1 (p.19)</b> Fuel Damage	<b>MU1 (p.20)</b> Loss of Spent Fuel Pool Level OR Temperature Control.
	<b>MU2 (p.21)</b> Loss of All Offsite communications Capabilities.
	<b>MU3 (p.22)</b> Loss of All Power for $\geq 24$ hours
<b>HAZARDS AND OTHER CONDITIONS</b>	
<b>HA1 (p.23)</b> Security Event in the Fuel Building.	<b>HU1 (p.24)</b> Security Event
<b>HA2 (p.25)</b> Conditions Indicate Actual OR Potential Substantial Degradation of the Level of Safety of the Plant.	<b>HU2 (p.26)</b> Conditions Indicate a Potential Degradation of the Level of Safety of the Plant.
<b>HA3 (p.27)</b> Natural OR Destructive Phenomena affecting the Spent Fuel Pool.	<b>HU3 (p.28)</b> Natural OR Destructive Phenomena.
<b>HA4 (p.29)</b> Fire OR Explosion Potentially Affecting Spent Fuel Pool Operations.	<b>HU4 (p.30)</b> Fire in a Radiologically Controlled Area (RCA) NOT Extinguished in $\leq 15$ minutes of Control Room notification or verification of alarms <b>OR</b> EXPLOSION in a Radiologically Controlled Area (RCA).
	<b>HU5 (p.31)</b> Toxic OR Flammable Gas Release Affecting Spent Fuel Pool Operations.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**RA1** - Release  $\geq 10$  X the Technical Specification Release Limit for  $\geq 15$  Minutes.

### INITIATING CONDITION

UNPLANNED release of gaseous or liquid radioactivity to the environment  $\geq 10$  X the Technical Specification Release Limit for  $\geq 15$  Minutes.

### EAL THRESHOLD VALUE

The first available Threshold Value method should be used to classify.

1. UNPLANNED Release  $\geq 10$  X the Technical Specification Release Limit for  $\geq 15$  Minutes.  
**OR**
2. Grab sample results indicate UNPLANNED gaseous release rates or liquid concentrations  $\geq 10$  X the Technical Specification Release Limit for  $\geq 15$  Minutes.  
**OR**
3. When Threshold Values 1 AND 2 are **NOT** available **OR CANNOT** be completed in  $\leq 15$  minutes for a gaseous release AND the SUM of Gaseous Releases calculated by EPIP 07 is:
  - SUSTAINED VALID Station Total Release Rate  $\geq 3.4 \text{ E}+04 \text{ } \mu\text{Ci/sec}$

### BASIS (References)

UNPLANNED - Any radiological release for which a Release Package was not prepared, OR any release associated with a Release Package that exceeds the release limits specified.

SUSTAINED - A duration of  $\geq 15$  minutes.

VALID - Readings are assumed accurate unless circumstances cause the reading to be suspect. A measurement can be confirmed by redundant measurement instrumentation or local readings.

A SUSTAINED UNPLANNED release of this magnitude that cannot be terminated in 15 minutes represents an uncontrolled situation that is an actual or potential substantial degradation of the level of safety of the plant. The degradation in plant control implied by the fact that the release can not be terminated in 15 minutes is the primary concern. The Emergency Director should not wait until 15 minutes has elapsed, but should declare an ALERT as soon as the release is determined to be uncontrolled or projected to be unisolable within 15 minutes.

THRESHOLD VALUE 1 - The instantaneous release rate limit ensures compliance with 10CFR20.1301 dose limits to the public. This limit also ensures the concentration of liquid effluents entering the lake is  $< 10$  X the value specified in 10CFR20, Appendix B.

THRESHOLD VALUE 2 - Grab samples are used to determine gaseous release rates or liquid concentrations to confirm monitor readings or when the effluent monitors are not in service.

## DEFUELED STATION EMERGENCY PLAN

THRESHOLD VALUE 3 - The sum of the vent stack paths for each unit and the fuel building exhaust provides a Total Station Gaseous Release Rate. The release rate was determined by calculation. The release rate calculated coincides with 10X the Technical Specification dose rate limit at the Unrestricted Area Boundary, assuming 100% of the radioactive effluent is Kr-85 for the release using the Fuel Handling Design Basis Accident dose calculation methodology. The Technical Specification dose rate limit restricts, at all times, the beta and gamma dose rates to an individual at or beyond the Site Boundary to 500 mRem/year to the whole body. The instantaneous release rate limit ensures compliance with 10CFR20.1301 dose limits to the public.

### Termination Recovery / Considerations

The source of the release is determined and isolated (terminated).

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**RU1 -** Release  $\geq 2$  X the Technical Specification Release Limit for  $\geq 60$  Minutes.

### INITIATING CONDITION

UNPLANNED release of gaseous or liquid radioactivity to the environment  $\geq 2$  X the Technical Specification Release Limit for  $\geq 60$  Minutes.

### EAL THRESHOLD VALUE

The first available Threshold Value method should be used to classify.

1. UNPLANNED Release  $\geq 2$  X the Technical Specification Release Limit for  $\geq 60$  Minutes.  
**OR**
2. Grab sample results indicate UNPLANNED gaseous release rates or liquid concentrations  $> 2$  X the Technical Specification Release Limit for  $\geq 60$  Minutes.  
**OR**
3. When Threshold Values 1 AND 2 are **NOT** available **OR CANNOT** be completed in  $\leq 60$  minutes for a gaseous release AND the SUM of Gaseous Releases calculated by EPIP 07 is:  
- **SUSTAINED Station Total Release Rate  $\geq 6.8\text{E}+03$   $\mu\text{Ci/sec}$ .**

### BASIS (References)

UNPLANNED - Any radiological release for which a Release Package was not prepared, OR any release associated with a Release Package which exceeds the release limit specified.

SUSTAINED - A duration of  $\geq 60$  minutes.

A SUSTAINED UNPLANNED release that cannot be terminated in 60 minutes represents an uncontrolled situation that is a potential degradation of the level of safety of the plant. The degradation in plant control implied by the fact that the release can not be terminated in 60 minutes is the primary concern. The Emergency Director should not wait until 60 minutes has elapsed, but should declare an UNUSUAL EVENT as soon as the release is determined to be uncontrolled or projected to be unisolable within 60 minutes.

THRESHOLD VALUE 1 - The instantaneous limit ensures compliance with 10CFR20.1301 dose limits to the public. This limit also ensures the concentration of liquid effluents entering the lake is  $< 2$  X the value specified in 10CFR20, Appendix B.

THRESHOLD VALUE 2 - Grab samples are used to determine gaseous release rates or liquid concentrations to confirm monitor readings or when the effluent monitors are not in service.

THRESHOLD VALUE 3 - The sum of the vent stack paths for each unit and the fuel building exhaust provides a Total Station Gaseous Release Rate. The release rate was determined by calculation. The release rate calculated coincides with 2X the Technical Specification dose rate limit at the Unrestricted Area Boundary, assuming 100% of the radioactive effluent is Kr-85 for the release using the Fuel Handling Design Basis Accident dose calculation methodology. The Technical Specification dose rate limit restricts, at all times, the beta and gamma dose rates to an individual at or beyond the Site Boundary to 500 mRem/year to the whole body. The instantaneous release rate limit ensures compliance with 10CFR20.1301 dose limits to the public

### Termination Recovery / Considerations

The source of the release is determined and isolated (terminated).



## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**RU2** - Increased Rad Levels or Airborne Concentrations.

### INITIATING CONDITION

UNCONTROLLED increase in plant radiation levels OR airborne concentrations.

### EAL THRESHOLD VALUE

ONE of the following:

1. Area Radiation Monitor readings or survey results indicate an UNCONTROLLED increase in radiation level to 100 mR/hr that is not the result of a planned evolution.
2. Continuous Air Monitor sample or survey results indicate an UNCONTROLLED increase in airborne concentration by a factor of 1000 that is not the result of a planned evolution.

### BASIS: (References)

UNCONTROLLED - an increase in < 12 hours of monitored radiation level or an increase from the last survey of airborne concentration that is not the result of a planned evolution and the source of the increased is not immediately recognized and controlled.

An UNCONTROLLED radiation level increase to 100 mR/hr was chosen to denote a condition caused by an unexpected source of radiation indicative of a loss of control of radioactive material. The value is well above normal expected radiation levels in the facility under the defueled condition.

An UNCONTROLLED increase in airborne concentration by a factor of 1000 was chosen to denote a condition caused by an unexpected source of radiation indicative of a loss of control of radioactive material. The value is well above normal expected airborne concentrations in the facility under the defueled condition.

Classification of an UNUSUAL EVENT is warranted as a precursor to more serious events. The concern of this EAL is the loss of control of radioactive material representing a potential degradation of the level of safety of the plant.

### Termination / Recovery Considerations

The source of the increased radiation or airborne concentration levels has been determined and levels have decreased to below the threshold values. Radiological controls have been implemented and are effective.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

MA1 - Fuel Damage

### INITIATING CONDITION

Dropped fuel assembly

### EAL-THRESHOLD VALUE

1. Report of visual observation of dropped fuel assembly(ies).

**AND**

2. Indication of  $\geq 100$  mR/hr on one or more of the following monitors:

ORT-AR21, ORT-AR22 Fuel Building Area Monitors  
ORT-AR13, Fuel Building Crane Monitor  
Spent Fuel Bridge Crane Portable Monitor

### BASIS: (References)

Damage to spent fuel represents a substantial degradation in the level of safety of the plant and therefore warrants an ALERT classification. Time is available to take corrective actions. NUREG/CR-4982, "Severe Accident in Spent Fuel Pools in Support of Generic Safety Issue 82," (July, 1987) indicates that even if corrective actions are NOT taken, no prompt fatalities are predicted and the risk of injury is low.

### Termination/Recovery Considerations:

Radiological controls have been established and are effective.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**MU1** - Loss of Spent Fuel Pool Level OR Temperature Control.

### INITIATING CONDITION

Decrease in Spent Fuel Pool Level OR temperature increase that is not the result of a planned evolution.

### EAL THRESHOLD VALUE

ONE of the following:

1. A decrease in Spent Fuel Pool level to 613-ft. elevation that is not the result of a planned evolution with no MAKEUP CAPABILITY.
2. Spent Fuel Pool temperature increase to  $\geq 150^{\circ}\text{F}$  that is not the result of a planned evolution.

### BASIS: (References)

MAKEUP CAPABILITY is the known availability of at least one makeup source capable of restoring level and transfer mechanism.

The 613 foot elevation level was chosen because it is approximately the minimum water level permitted by Technical Specifications. A low level alarm activates at 614 feet 4 inches. Normal level is maintained from 614 feet 6 inches and 615 feet 2 inches. The 613 foot level is approximately 23 feet above the top of the spent fuel.

Classification of an UNUSUAL EVENT for the threshold value is warranted as a precursor to more serious events and a potential degradation in the level of safety of the plant. The events described as threshold values tend to have a long lead-time relative to a radiological release and thus the threat is very low.

### Terminate/Recovery Considerations

The cause of the loss of water inventory or cooling capability has been determined and actions to recover water level or temperature control are successful.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**MU2 -** Loss of All Offsite Communications Capabilities

### INITIATING CONDITION

UNPLANNED Loss of All Offsite Communications Capabilities

### EAL-THRESHOLD VALUE

Loss of All of the following offsite communications capability:

1. NARS
2. ENS
3. Commercial telephones
4. Cellular telephones

### BASIS: (References)

UNPLANNED – The loss of communications is not the result of planned maintenance or surveillance activities.

The threshold value recognizes that loss of communication capability inhibits the ability to communicate problems to the offsite authorities. The loss of communications is more comprehensive than those reportable under 10CFR50.72. The loss of communication is applicable when no direct means is available to communicate with or make notification to State and Federal authorities.

### Termination/Recovery Considerations

At least one means of communications is re-established.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**MU3** - Loss of All Power for  $\geq 24$  hours

### INITIATING CONDITION

Loss of all power for  $\geq 24$  hours.

### EAL-THRESHOLD VALUE

Loss of all power for  $\geq 24$  hours.

### BASIS: (References)

A prolonged loss of AC power degrades the level of safety of the plant. 24 hours was selected as a threshold value to allow for restoration of offsite power. The concern of the loss of offsite power is the ability to cool the Spent Fuel Pool. The effects of the loss of offsite power are applicable to EAL MU1.

Electrical connections allowing for portable, temporary generator capability are installed.

Declaration of an Unusual Event is not applicable when the loss of offsite power sources is due to a planned evolution. A planned evolution involves significant preplanning and specific controls established prior to knowingly entering the condition.

### Termination/Recovery Considerations:

A reliable power supply is re-established.

## **DEFUELED STATION EMERGENCY PLAN**

### **MATRIX DESCRIPTION**

**HA1 -** CONFIRMED Security Event in the Fuel Building.

### **INITIATING CONDITION**

CONFIRMED Security event in the Fuel Building.

### **EAL THRESHOLD VALUE**

Intrusion into the Fuel Building by a hostile force.

### **BASIS: (References)**

CONFIRMED – Determination that the security event is actual.

Intrusion of a hostile force into the Fuel Building represents a substantial degradation in the level of safety of the plant. A confirmed bomb device discovered in the Fuel Building constitutes an intrusion by a hostile force.

### **Termination / Recovery Considerations**

The threat to the level of safety of the plant no longer exists.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

HU1 - CONFIRMED Security Event

### INITIATING CONDITION

CONFIRMED Security event onsite AND outside the Fuel Building that indicates a potential degradation in the level of safety of the plant.

### EAL THRESHOLD VALUE

1. A credible threat to the station reported by the NRC.

**OR**

2. A CONFIRMED Threat meets ALL of the following criteria:
  - A credible threat reported by any other outside agency or security procedures.  
AND
  - Is specifically directed toward the station  
AND
  - Is IMMINENT

**OR**

3. A civil disturbance which disrupts normal plant operations.

### BASIS: (References)

IMMINENT – The threatened action or event will occur within 2 hours.

CONFIRMED – Determination that the event is actual.

Consultation with Security supervision is required to determine these Threshold Values.

A CONFIRMED security threat per the Safeguards Contingency Plan outside the Fuel Building is a potential degradation in the level of safety of the plant.

A civil disturbance is considered to disrupt normal plant operations if it obstructs ingress or egress to the owner controlled area or if it requires actions to intervene and control by Local Law Enforcement Agencies (LLEA).

### Termination / Recovery Considerations

The threat to the level of safety of the plant no longer exists.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**HA2 -** Conditions Indicate Actual **OR** Potential Substantial Degradation of the Level of Safety of the Plant

### INITIATING CONDITION

Other conditions judged warranting declaration of ALERT.

### EAL-THRESHOLD VALUE

Other conditions exist which in the judgment of the Emergency Director indicate that plant systems may be degraded and that increased monitoring of plant functions is warranted.

### BASIS: (References)

ALERT - Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

A condition exists which, in the judgment of the Emergency Director, presents an actual or potential substantial degradation in the level of safety of the plant. Emergency Director judgment is to be based on known conditions and the expected response to mitigating activities.

### Termination / Recovery Considerations

In the judgment of the Emergency Director, an ALERT no longer exists and the challenge to the safety of the plant no longer exists.



## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**HU2** - Conditions Indicate a Potential Degradation of the Level of Safety of the Plant.

### INITIATING CONDITION

Other conditions judged warranting declaration of an UNUSUAL EVENT.

### EAL-THRESHOLD VALUE

Other conditions exist which in the judgment of the Shift Supervisor indicate a potential degradation in the level of safety of the plant.

### BASIS: (References)

UNUSUAL EVENT - Events are in process of have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Any condition not explicitly detailed as an EAL threshold value, which, in the judgment of the Emergency Director, is a potential degradation in the level of safety of the plant. Emergency Director judgement is to be based on known conditions and the expected response to mitigating activities within a short time period.

### Termination / Recovery Considerations

In the judgment of the Emergency Director, an UNUSUAL EVENT no longer exists and the hazard to the level of safety of the plant no longer exists.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**HA3** - Natural **OR** Destructive Phenomena affecting the Spent Fuel Pool

### INITIATING CONDITION

Natural **OR** Destructive phenomena affecting the Spent Fuel Pool

### EAL-THRESHOLD VALUE

1. CONFIRMED Seismic event  $\geq 5.0$  (Richter scale) that occurred within 125 miles.

**OR**

2. Tornado striking the Fuel Building.

**AND**

3. Indication of  $> 100$  mR/hr on one or more of the following monitors:

- ORT-AR21, ORT-AR22 Fuel Building Area Monitors
- ORT-AR13, Fuel Building Crane Monitor
- Spent Fuel Bridge Crane Portable Monitor

### BASIS: (References)

CONFIRMED - A call to the National Earthquake Center is the primary confirmation source. Other confirmation includes reports from television or radio stations, or reports from university monitoring stations.

These Threshold Values are natural or destructive phenomena that represent actual or potential substantial degradation of the level of safety of the plant. The affects of the phenomena should also be evaluated on a system or component basis in relation to Technical Specifications.

Threshold Value 1 - A seismic event may cause damage to facilities and represents a potential substantial degradation of the level of safety of the plant. A confirmation call to the National Earthquake Center will confirm that an earthquake has occurred and will provide a magnitude and location of the earthquake. The magnitude and distance are based on Reg Guide 1.166, Pre-earthquake Planning and Immediate Nuclear Power Plant Operator Post earthquake Actions, Appendix A.

Threshold Value 2 - A tornado strike must include an effect on systems or components that affects the operability or integrity of the system or structure within the Fuel Building.

Threshold Value 3 – Indicates damage to spent fuel in the Spent Fuel Pool equivalent to MA1 that could be the result of a seismic event or tornado.

### Termination/Recovery Considerations

No further hazard exists and damage assessment, per EPRI NP-6695, Guidelines for Nuclear Plant Response to an Earthquake, is in progress.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

HU3- Natural OR Destructive Phenomena

### INITIATING CONDITION

Natural OR destructive phenomena

### EAL-THRESHOLD VALUE

1. CONFIRMED Seismic event felt by plant personnel

OR

2. Report of a tornado strike at the plant.

### BASIS: (References)

CONFIRMED - A call to the National Earthquake Center is the primary confirmation source. Other confirmation includes reports from television or radio stations, or reports from university monitoring stations.

These Threshold Values are natural or destructive phenomena that represent potential degradation of the level of safety of the plant. The affects of the phenomena should also be evaluated on a system or component basis in relation to Technical Specifications.

Threshold Value 1 - Seismic events may cause damage to facilities and represents a potential degradation of the level of safety of the plant. A confirmation call to the National Earthquake Center will confirm that an earthquake has occurred.

Threshold Value 2 - Any report that a tornado has touched down at the plant meets this Threshold Value.

### Termination/Recovery Considerations

No further hazard exists and damage assessment, per EPRI NP-6695, Guidelines for Nuclear Plant Response to an Earthquake, is in progress.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**HA4 - Fire OR EXPLOSION** Potentially Affecting Spent Fuel Pool Operations

### INITIATING CONDITION

Fire **OR** EXPLOSION potentially affecting Spent Fuel Pool operations.

### EAL-THRESHOLD VALUE

1. Fire **OR** EXPLOSION in or near the Fuel Building.

**AND**

2. Indication of  $\geq 100$  mR/hr on one or more of the following monitors:

ORT-AR21, ORT-AR22 Fuel Building Area Monitors  
ORT-AR13, Fuel Building Crane Monitor  
Spent Fuel Bridge Crane Portable Monitor

### BASIS: (References)

EXPLOSION - A rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment, that potentially imparts significant energy to nearby structures or equipment.

Only explosions of sufficient force to cause damage (deformation, scorching) to structures or equipment required for operation should be considered. This EAL is based on fires or explosions that may have damaged plant structures that will affect the Spent Fuel Pool.

Damage caused by a fire or explosion must also affect the spent fuel as indicated by an increase in radiation level.

### Termination/Recovery Considerations

Plant operations are no longer effected by the event.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**HU4-** Fire in a Radiologically Controlled Area (RCA) NOT Extinguished in  $\leq 15$  minutes **OR** EXPLOSION in a Radiologically Controlled Area (RCA).

### INITIATING CONDITION

Fire in a Radiologically Controlled Area (RCA) NOT Extinguished in  $\leq 15$  minutes of Control Room notification or verification of alarms **OR** EXPLOSION in a Radiologically Controlled Area (RCA).

### EAL-THRESHOLD VALUE

ONE of the following:

1. Fire in a Radiologically Controlled Area (RCA) NOT extinguished in  $\leq 15$  minutes of Control Room notification or verification of alarms.
2. EXPLOSION in a Radiologically Controlled Area (RCA).

### BASIS: (References):

VERIFICATION - Determination is made that the fire alarm is not spurious.

EXPLOSION- a rapid, unconfined combustion or catastrophic failure of pressurized equipment that imparts significant energy to nearby structures or equipment.

The purpose of this EAL is to address only fires that are potentially significant precursors to system damage and spread of radiological contamination. This excludes such items as fires within administration buildings, wastebasket fires, and other small fires of no consequence.

Only explosions of sufficient force to cause damage should be considered. Damage assessment should not be beyond the report of visual damage for classification purposes. The Emergency Director also needs to consider any security aspects of the explosion.

### Termination/Recovery Considerations

Fire extinguished and the operational impact of the fire has been evaluated.

## DEFUELED STATION EMERGENCY PLAN

### MATRIX DESCRIPTION

**HU5 - TOXIC OR** Flammable Gas Release Affecting Spent Fuel Pool Operations

### INITIATING CONDITION

Release of **TOXIC OR** flammable gases may be detrimental to normal plant operations.

### EAL-THRESHOLD VALUE

ONE of the following:

1. Report or detection of **TOXIC** or flammable gases in amounts that can affect Spent Fuel Pool operations.
2. Report by Local, County, or State officials of potential evacuation or sheltering of site personnel based on offsite event.

### BASIS: (References)

TOXIC - Exposure to the worker in excess of the limits specified in 29 CFR 1910.1000. In practice, this should be considered for concentrations that are capable of incapacitating the worker.

The potential for the degradation in the level of safety of the plant through the affect of toxic **OR** flammable gas on the health of personnel **OR** normal plant operations is to be considered for declaration of the **UNUSUAL EVENT**. Plant operations are affected when the condition disrupts the ability to perform surveillance activities or causes an alteration in normal activities. The source of the toxic or flammable gas could be from inside or outside the site and is **NOT** the issue.

### Termination/Recovery Considerations

The release of toxic material is terminated and the operational impact of the release has been eliminated.

**DEFUELED STATION EMERGENCY PLAN**

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## DEFUELED STATION EMERGENCY PLAN

### 6.0 EMERGENCY MEASURES

Emergency measures begin with the recognition of abnormal conditions, identification of established Initiating Conditions and classification to a Defueled Emergency Action Level. Emergency measures also include notifications, mitigative actions, corrective actions and onsite protective actions for the station personnel.

### 6.1 NOTIFICATION AND ACTIVATION

The authority and responsibility for initially classifying and declaring emergencies, initiating notification to the NDO, State and NRC officials, and initiating corrective and mitigative actions resides with the Emergency Director Position which is assumed by the Shift Supervisor upon the declaration of an emergency.

The Shift Supervisor is the Emergency Director and assumes Command and Control upon classification of the event. Predetermined schedules are in place to determine the next qualified Emergency Director to relieve the Emergency Director. The Emergency Director being relieved shall announce that the Emergency Director coming on shift now has Command and Control and the DERO will report directly to this individual. Transfer of Command and Control shall be verbal and direct.

During normal working hours, the DERO is activated by a PA announcement. Off-hours staffing will be performed by a callout initiated by the Emergency Director. The State will be notified by the Nuclear Accident Reporting System (NARS) notification network.

#### 6.1.1 NUCLEAR ACCIDENT REPORTING SYSTEM (NARS)

The NARS is a dedicated phone system using a two number code to connect the corporate organization and the Illinois Emergency Management Agency (IEMA). It contains information that identifies the station, classification, meteorological data and Emergency Action Level (EAL). In the event of failure of the NARS network, commercial telephone lines would be used to make notifications to IEMA.

Wisconsin Emergency Management is notified using commercial lines after notification is made to IEMA.

Illinois State agencies will be notified within 30 minutes of event classification or change of classification. Local agency notifications are made by the State.

#### 6.1.2 NRC EVENT NOTIFICATION SYSTEM (ENS)

The ENS is a dedicated telephone system used to notify the NRC Operations Center. The NRC will be notified immediately after State notifications and within 1 hour of event classification or change in classification. In the event of failure of the ENS, commercial phone lines would be used to notify the NRC.

### 6.2 ASSESSMENT ACTIONS

#### 6.2.1 INITIAL ASSESSMENT

Classification of events is performed by the Shift Supervisor in accordance with EALs provided in Section 5.0. Once the classification has been made the Shift Supervisor becomes the Emergency Director until the next qualified Emergency Director assumes the responsibilities of Command and Control.



## DEFUELED STATION EMERGENCY PLAN

### 6.2.2 DOSE ASSESSMENT

Dose Assessments are performed by the Control Room and supplemented by the augmented DERO. Dose assessment by the Control Room is required for accident classification purposes. The basis for the classifications of Unusual Event (RU1) and Alert (RA1) was established in Design Basis Accident dose calculation and Technical Specification dose rate limits. Based on this fixed methodology, the Control Room requires only an assessment of the station release rate. Guidance for determining release rate is procedurally provided. Classification levels for RU1 and RA1 are directly provided in Section 5. The augmented DERO provides full dose assessment capability.

### 6.3 CORRECTIVE ACTIONS

Station Normal and Abnormal Operating Procedures and Emergency Plan Implementing Procedures provide preventive and/or corrective actions that mitigate the consequences of fuel damage events. Instrumentation, control systems and radiation monitoring systems provide indications of the safe and orderly operations. These systems provide the operator with the information needed to monitor the Spent Fuel Pool and supporting systems. They further provide the means to monitor and cope with an emergency condition should one occur. System indications and controls are in the Control Room at locations convenient to the Operations staff. These instruments provide the basis for event classification and initiation of onsite protective actions.

In the event of a fire, the Zion Fire Department is called.

### 6.4 PROTECTIVE ACTIONS

Protective actions for onsite personnel are provided for their health and safety. Implementation guidelines for onsite protective actions is provided in Emergency Plan Implementing Procedures (EPIPs).

#### 6.4.1 ASSEMBLY/ACCOUNTABILITY

Assembly and accountability should be considered and used as a protective action whenever a site wide risk to health or safety exists and prudence dictates. When the site wide risk is a Security Threat, consult with security to determine if assembly is prudent.

Assembly is accomplished by sounding the Assembly siren. All onsite personnel shall report to the Control Room Complex. Contaminated or potentially contaminated personnel shall report to the Decontamination Room. Accountability of all personnel onsite should be accomplished within 60 minutes after an Assembly is announced.

Security personnel will perform accountability. The Emergency Director shall maintain accountability for all onsite personnel throughout the event.

#### 6.4.2 RADIOLOGICAL POSTED AREAS (RPAs)

RPTs or the Radiation Protection Director may establish Radiologically Posted Areas (RPAs) in response to the event. The RP Director shall control access to all RPAs unless immediate access is authorized by the Emergency Director to facilitate emergency repairs.

## DEFUELED STATION EMERGENCY PLAN

### 6.4.3 EXPOSURE CONTROL

Individuals authorized to enter RPAs are required to have in their possession dosimetry capable of measuring a dose received from external sources of ionizing radiation. RPTs may be assigned to Emergency Inplant Teams to provide radiological controls and to monitor team exposure if deemed necessary by the RP Director.

### 6.4.4 PERSONNEL CONTAMINATION CONTROL

All personnel are monitored for radioactive contamination prior to leaving the site. Portable radiation survey meters are available to frisk personnel for suspected contamination. RPTs trained in decontamination procedures, if necessary, will perform decontamination. Documentation of surveys, contamination and decontamination efforts shall be maintained.

### 6.4.5 ACCESS CONTROL

Normal access control shall be maintained unless otherwise directed. The Emergency Director will control access to the station when the DERO is activated.

### 6.4.6 PROTECTIVE EQUIPMENT AND SUPPLIES

Protective clothing and respiratory equipment is maintained at the entry to the RPA for use by Emergency Inplant Teams as directed by the RP Director.

### 6.4.7 MEDICAL TRANSPORT

Injured or radioactively contaminated injured personnel requiring medical assistance are transported through agreement with the Zion Rescue Department to Victory Memorial Hospital in Waukegan. Ambulance service is available at all times. Personnel qualified in radiation protection practices are directed to report to the hospital or accompany the injured and contaminated patient(s). Communication to the hospital is made with commercial telephones. The ambulance crews are trained to address contaminated injured cases. The hospital is equipped for contaminated injuries and the staff is trained for these contingencies. Contaminated wounds are treated and decontaminated by the hospital staff.

## DEFUELED STATION EMERGENCY PLAN

### 7.0 EMERGENCY RESPONSE FACILITIES AND EQUIPMENT

#### 7.1 FACILITIES

##### 7.1.1 CONTROL ROOM

The Control Room is where plant systems and equipment parameters are monitored continuously. The Control Room is the initial onsite center for emergency Command and Control. Control Room personnel assess plant conditions, evaluate the magnitude and potential consequences of abnormal conditions, initiate preventative, mitigating and corrective actions and perform notifications. When activated, the DERO reports to the Control Room. The Shift Supervisor shall assume the position of Emergency Director with Command and Control once the decision to classify the event has been made.

##### 7.1.2 CORPORATE FACILITIES

The EOF is located at the corporate offices. The EOF is the location from which the Corporate ERO will evaluate, coordinate and direct Company resources and activities in support of the station if requested. The EOF may be activated at the discretion of the NDO or station Emergency Director. The Nuclear Duty Officer and Communications Services are responsible for media relations and subsequent press releases, if any.

#### 7.2 COMMUNICATIONS CAPABILITIES

Dedicated communications systems at Zion Station allow effective coordination of any emergency response.

##### 7.2.1 COMMUNICATIONS

Following an event classification, the Shift Supervisor or a designee makes initial notifications in accordance with Sections 6.1.1 and 6.1.2. The Control Room shall establish a communications link with the EOF when activated by the NDO.

Reliable intraplant and plant-to-offsite communications include:

- A public address system
- A commercial telephone system
- Portable Radios
- NARS

## DEFUELED STATION EMERGENCY PLAN

### 7.3 ASSESSMENT RESOURCES

#### 7.3.1 ONSITE METEOROLOGICAL MONITORING INSTRUMENTATION

Meteorological monitoring capabilities are described in the DSAR.

##### 7.3.1.1 INSTRUMENTATION

The meteorological tower conforms to the recommendations of Regulatory Guide 1.23 and ANSI/ANS 2.5 (1984). The equipment is placed on booms oriented into the generally prevailing wind at the site. Equipment signals are brought to an instrument building with controlled environmental conditions. The building at the base of the tower houses the recording equipment, signal conditioners, etc., used to process and re-transmit the data to the end point users.

##### 7.3.1.2 METEOROLOGICAL MEASUREMENT PROGRAM

Cooperation between the corporate office and the meteorological contractor assures that a timely restoration of any outage can be made. Emergency field visits to the site are made as quickly as possible.

The meteorological consultant provides a 24-hour a day, seven days per week data source consisting of all routinely available National Weather Service Information. This allows for the detailed preparation of forecasts for the duration of an emergency.

Meteorological data are available to the station Control Room and EOF for use in the Dose Assessment Computer Model method for estimating the environmental impact of unplanned releases of radioactivity from the station.

#### 7.3.2 RADIATION MONITORING

The Zion DSAR describes the radiation monitoring system (RMS) in detail.

##### 7.3.2.1 RADIATION MONITORING SYSTEM

The installed Radiation Monitoring System (RMS) is designed to continuously monitor Fuel Building activity and station liquid effluents. The system includes Control Room readouts and recorders for selected parameters that are monitored and an audible or visual Control Room alarm when predetermined setpoints are exceeded. The system can be subdivided into process instrumentation and an area monitoring system.

The process instrumentation consists of pumps, filter samplers, detectors, and associated electronics to determine noble gas, and particulate concentrations in air or liquid effluents. Liquid effluent pathways have control functions that will terminate a release at a predetermined setpoint. These setpoints are premised on compliance with federal regulations.

The area monitoring system provides information on existing radiation levels in the Fuel Building to ensure safe occupancy and to provide early indication of changing radiological conditions. It is equipped with Control Room and local readout and audible alarms to warn personnel of an increased radiation level.

##### 7.3.2.2 RADIOLOGICAL NOBLE GAS EFFLUENT MONITORING

The single ventilation exhaust from the Spent Fuel Nuclear Island is monitored by an effluent monitor with a nominal range of  $5 \times 10^{-7}$   $\mu\text{Ci/cc}$  to approximately  $2 \times 10^{-2}$   $\mu\text{Ci/cc}$ . The ventilation exhaust from Zion Station Auxiliary Building is reduced to two effluent streams. Each stream provides a readily available sampling pathway for effluent quantification.

## DEFUELED STATION EMERGENCY PLAN

The method of converting instrument readings to release rates are determined using EPIPs. Actual releases are quantified by collecting grab samples, counting the samples, and calculating the releases.

### 7.3.2.3 PARTICULATE EFFLUENT MONITORING

The single ventilation exhaust from the SFNI is monitored by an effluent monitor with a nominal range of  $5 \times 10^{-11}$   $\mu\text{Ci/cc}$  to  $5 \times 10^{-6}$   $\mu\text{Ci/cc}$ .

The ventilation exhaust from the Auxiliary Building stack effluent pathways are continuously sampled for effluent quantification.

### 7.3.2.4 STATION SURVEY AND COUNTING EQUIPMENT

Zion Station maintains portable survey instrumentation to assess contamination levels, exposure rates, and airborne gaseous and particulate concentrations. This equipment includes GMs, ion chambers and air samplers.

The Zion Station counting room contains Germanium gamma spectrometer systems, gas-flow proportional counters for alpha and beta/gamma analysis, and liquid scintillators for tritium analysis.

The Station uses various combinations of TLDs, and electronic dosimeters to monitor personnel exposures. In addition, a whole body counting system for bioassay determinations is available at other nuclear facilities to quantify internal exposure.

### 7.3.3 FIRE DETECTION

Onsite Fire Detection Instrumentation capabilities are described in the Zion Fire Protection Report.

### 7.3.4 SITE HYDROLOGICAL

Site Hydrological Characteristics of the Zion Station are described in the Zion Station DSAR.

## DEFUELED STATION EMERGENCY PLAN

### 8.0 MAINTAINING EMERGENCY PREPAREDNESS

#### 8.1 ORGANIZATION

The Decommissioning Plant Manager is responsible for staffing the station Emergency Response Organization (ERO) and approval of the Emergency Plan Implementing Procedures (EPIPs). The Decommissioning Plant Manager shall assign a staff member as the Emergency Preparedness Coordinator (EPC) to work with the Corporate Emergency Preparedness organization. The EPC shall be responsible for maintaining the ability to implement the DSEP through the EPIPs and appropriate training of station personnel.

The Defueled Station Emergency Plan (DSEP) shall be maintained by the Corporate Emergency Preparedness organization under the EP Manager. Changes to the DSEP shall be controlled as delineated in Section 8.4.

##### 8.1.1 DECOMMISSIONING PLANT MANAGER

The Decommissioning Plant Manager has the following additional responsibilities:

- Ensure the operational readiness of station communication systems for use during an emergency, by verification during drills (as described in this Section);
- Ensure the operational readiness of station emergency equipment and supplies;
- Ensure that Station EPIPs and lesson plans are prepared and are reviewed every two years.

##### 8.1.2 OVERSIGHT

To meet the requirements of 10CFR50.54 (t), the Station shall provide for a review of the Emergency Preparedness Program by persons who have no direct responsibility for implementation of the program. Actions shall be taken for evaluation and correction of all review findings.

#### 8.2 TRAINING

The proficiency of emergency response personnel (as defined in 10CFR50 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.
- Initial training and annual retraining on the DSEP and 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 to be conducted on a calendar year basis.
- Training on DSEP changes shall be completed within thirty (30) days of implementation of the change.
- Participation in drills designed to sharpen those skills which they are expected to use in the event of an emergency.

## DEFUELED STATION EMERGENCY PLAN

### 8.2.1 EMERGENCY PREPAREDNESS TRAINING (EPT) MATRIX

The training program for emergency response personnel is developed based on the requirements of 10CFR50 Appendix E and position specific responsibilities as defined in this document. Emergency response personnel in the following categories receive initial training and retraining each year:

Shift Supervisors, Emergency Directors, Technical Directors and Radiation Protection Directors shall have training conducted such that proficiency is maintained on the topics listed below. These subjects shall be covered as a minimum on an annual basis.

- Emergency Action Level Classification
- Dose Assessment
- Nuclear Accident Reporting System (NARS) Form completion and use of the NARS system
- Federal, state and local notification procedures as appropriate.
- Site specific procedures for activating the onsite and offsite Emergency Response Organization.

Emergency response personnel, in the following categories 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 Nuclear Station General Employee Training.

Equipment Operators and Maintenance personnel are trained to function as Emergency Inplant Teams.

Radiation Protection and Chemistry 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, time limits, and other protective actions specific to the conditions present.

Medical Support Personnel. Offsite ambulance and hospital personnel are offered annual training in accordance with a program provided by Corporate Emergency Preparedness.

Security Personnel. Station security personnel are trained in accordance with training defined by the Station Security Program.

### 8.2.2 EMERGENCY RESPONSE ORGANIZATION TRAINING

The EPC has the responsibility for ensuring that the Emergency Response Organization receives all necessary training and retraining.

#### 8.2.2.2 NON-EXELON EMERGENCY RESPONSE SUPPORT

The Decommissioning Plant Manager shall make an annual written offer to train those non-Exelon organizations which 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 by Exelon or State of Illinois personnel shall acquaint the participants with the special problems potentially encountered during an emergency, notification procedures and their expected roles. Those organizations that must enter the site shall also receive site specific emergency response training. They shall also be instructed as to the identity (by position and title) of those persons in the onsite organization who will control their support activities.

## DEFUELED STATION EMERGENCY PLAN

### 8.2.2.3 STATION EMERGENCY RESPONSE ORGANIZATION

Station management shall ensure the attendance of onsite personnel for training. Using approved lesson plans, the Station shall conduct onsite emergency personnel initial and retraining for the Emergency Response Organization.

### 8.3 DRILLS

#### 8.3.1 PERFORMANCE DRILLS

The EPC shall ensure that Federally prescribed exercises are conducted biennially in order to test the adequacy of the implementing procedures and methods; test emergency equipment and communication networks; and to ensure that emergency personnel are familiar with their duties. For alternate years, a drill will be conducted meeting the same requirements. Both the exercise and drill will include activation of the DERO in conjunction with the Control Room.

An offer to participate in the exercise or drill shall be made to the State agencies. A written scenario shall be prepared. The scenario shall include:

- Objectives
- Dates, time period, facilities activated and participating organizations
- Simulated event descriptions
- Timeline containing a schedule of real and simulated events
- Narrative Summary describing how the drill will be presented including expected actions
- List of qualified participants

A critique shall be conducted as soon as practical after each drill. The critique shall evaluate the ability of the organization to respond to a simulated emergency situation.

#### 8.3.2 EQUIPMENT AND PROFICIENCY DRILLS

##### 8.3.2.1 COMMUNICATIONS DRILLS

Monthly - The capability of the Nuclear Accident Reporting System (NARS) and ENS shall be demonstrated.

Annually - The emergency communications systems shall be fully tested.

##### 8.3.2.2 HEALTH PHYSICS DRILLS

Health Physics Drills shall be conducted annually. These drills shall include response to, and analysis of, simulated radioactive airborne and liquid samples within the plant.

##### 8.3.2.3 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) shall be conducted annually. The medical drill may be performed as part of the required annual Performance Drill.



## **DEFUELED STATION EMERGENCY PLAN**

### **8.3.2.4 ASSEMBLY AND ACCOUNTABILITY DRILLS**

An assembly and accountability drill shall be conducted annually. The drill shall include identifying the locations of all individuals onsite. Successful demonstration of assembly and accountability as a part of the annual Performance Drill shall serve as the successful completion of this drill requirement in that calendar year.

### **8.3.2.5 OFFSHIFT STATION AUGMENTATION DRILL**

An unannounced offshift notification drill shall be conducted semi-annually. These drills shall involve implementation of the notification procedure and documentation of the times at which persons are notified. No actual travel is required. Participants provide an estimation of their travel time to the station. This drill shall serve to demonstrate the capability to augment the onshift staff in a short period after declaration of an emergency.

### **8.4 CONTROLLED DOCUMENTS**

To ensure that the DSEP and the corresponding EIPs and lesson plans are maintained current, the EPC shall ensure the following:

- DSEP and EIPs shall be distributed on a controlled basis to all positions and locations requiring them and all appropriate NRC offices;
- The DSEP will be reviewed on an annual basis. The DSEP shall be updated as needed. The most current approved revisions shall remain in effect until revised so long as it is certified as current. In those years when the review does not warrant a revision, a letter to that affect will be issued.
- Proposed revisions to the DSEP and Implementing Procedures shall be reviewed and approved per Station program administration EIP. Documentation regarding this review and approval shall be maintained for the reviews by Nuclear Oversight.
- The Decommissioning Plant Manager shall approve the DSEP for use.
- All locations of a controlled document shall receive approved changes. Revised pages of these documents shall be dated with effective change date and marked to show where changes have been made. Where the extent of the changes is broad enough to warrant a summary of changes, the summary is included with the document's distribution; the new pages shall be added and the old pages shall be deleted;
- Emergency Plan Implementing Procedures and corresponding lesson plans shall be developed consistent with the DSEP within 1 month of any DSEP revision and reviewed every two years. The Decommissioning Plant Manager shall ensure that this review is conducted for EIPs;
- Names and phone numbers of the emergency response organization and support personnel shall be reviewed and updated at least quarterly;
- Whenever exercises or drills indicate deficiencies in the DSEP or corresponding EIPs, such documents shall be revised as necessary to ensure corrective action,
- Letters of Agreement or contracts for services.

## DEFUELED STATION EMERGENCY PLAN

### 8.5 NUCLEAR STATION SECURITY PLAN AND DSEP

The station shall have a Security Plan that complies with the requirements of 10CFR73.

The interface between the DSEP and the Station Security Plan is one of parallel operation. The plans are compatible. The DSEP emergency response measures, once initiated, are executed in parallel with measures taken in accordance with the Station Security Plan.

The Station Security Plan, Appendix C, Contingency Events, identifies situations that could be initiating conditions for emergency response measures. The Station 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 initiate the DSEP, will be the responsibility of the Emergency Director.

**ATTACHMENT 3  
ZION NUCLEAR POWER STATION  
REVISED EMERGENCY PLAN IMPLEMENTING PROCEDURES**

**EPIP-07, "CALCULATION OF STATION NOBLE GAS RELEASE RATE TO DETERMINE DSEP  
CLASSIFICATION," REVISION 3**

**EPIP-08, "CONTAMINATED INJURY RESPONSE," REVISION 3**

# **CALCULATION OF STATION NOBLE GAS RELEASE RATE TO DETERMINE DSEP CLASSIFICATION**

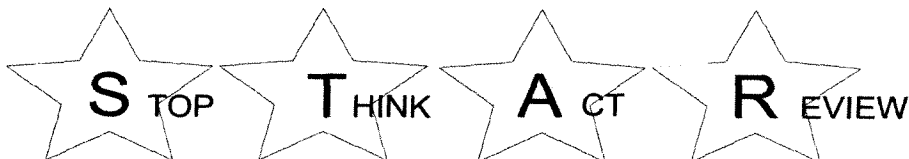
**March 13, 2006**

**Zion Station**

**UNIT 1, 2 AND COMMON**

Summary of Changes in this Revision:

- Delete discussion of 1(2)RIA-PR49 Channels 7 and 9.



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A. PURPOSE

The purpose of this procedure is to provide a method to estimate the station noble gas release rate to determine if a DSEP classification exists during an unplanned or abnormal release.

B. SCOPE

Applies to shift personnel and Rad Chem personnel assessing unplanned station radioactive releases.

C. REFERENCES

1. Section 5.0 of the DSEP, Classification of Emergencies

D. PREREQUISITES

1. Make at least one copy of page 4 and Attachments 1 through 3 to use as work sheets to facilitate completion of the procedure.

E. PRECAUTIONS

None

F. LIMITATIONS AND ACTIONS

1. The Operating Staff should obtain Rad Chem Supervision support for an independent calculation of the Maximum Instantaneous Release Rate.
2. If the release cannot be assessed because the monitors used in this procedure are not on scale or are inoperable, Then obtain a noble gas grab sample to assess the release.
3. The only available noble gas at Zion Station is Kr-85. It is only present in the fuel rods stored in the fuel building spent fuel pool.
4. When this procedure has been complete, Then Rad Chem Supervision should calculate the release rate and quantity based on isotopic data in order to report the percentage of the 10CFR20 release rate and incorporate the release quantities into the applicable effluent release reports.
5. Noble gas release rates and release quantities calculated by this procedure may be input to the MESOREM 99 dose projection model.

G. MAIN BODY – RELEASE QUANTIFICATION

1. Vent Stack Pathway

1.1. DETERMINE the release concentration out each available stack pathway (U1 and U2) And USE Attachment 1 to determine the total stack release rate.

1.1.1. If the available units 1(2)RIA-PR49 SPING is operable, Then, USE the channel 5 value on Attachment 1 as the stack(s) release concentration.

1.1.2. If a SPING is inoperable, Then, obtain and analyze a noble gas sample from the applicable SPING. Use the isotopic result on Attachment 1 as the stack(s) release concentration.

2. Fuel Building Pathway

2.1. DETERMINE the release concentration out the fuel building ventilation pathway And USE Attachment 2 to determine fuel building release rate.

2.1.1. If ORT-PR30A is operable, Then, use the monitor value on Attachment 2 as the fuel building release concentration.

2.1.2. If ORT-PR30A is inoperable, Then, obtain and analyze a noble gas sample from ORT-PR30A. Use the isotopic results on Attachment 2 as the fuel building release concentration.



3. Total Station Release
  - 3.1. COMPLETE Attachment 3. Sum attachments 1 and 2 to determine the total station release rate.
  - 3.2. Compare the total station release rate to release rate limits in Section 5.0 of the DSEP
  - 3.3. Classify event if release rate limits of EAL's RU-1 or RA-1 are exceeded.
4. Follow-up Activities
  - 4.1. As soon as possible after initial calculations using monitor data, Rad Chem should obtain and analyze noble gas samples from the affected release pathways.
  - 4.2. Rad Chem should recalculate release rates using available isotopic analysis.
  - 4.3. Rad Chem should perform dose assessments using available release data (e.g., rate, duration, pathway).
  - 4.4. Rad Chem should CALCULATE And DOCUMENT total activity released for inclusion in applicable effluent release reports.

## ATTACHMENT 1

### Vent Stack Release Rate Determination

(1RIA-PR49 and 2RIA-PR49)

1. Determine the maximum release concentration out EACH stack pathway using one of the following methods (a) or (b) (c) for each stack pathway:

- a. If SPING channel 5 is operable Then, document the applicable units release concentration using channel 5. |

At the SPING control terminal, use the 'Hist Min' command to print the most recent one-minute averages for each applicable channel 5. Record the highest reading for each applicable channel 5.

U-1 Channel 5 reading \_\_\_\_\_ uCi/cc.

U-2 Channel 5 reading \_\_\_\_\_ uCi/cc.

- b. If a SPING is inoperable, Then, OBTAIN and document isotopic data for the highest level possible during the release. (Notify Rad Chem to collect and analyze or use data Rad Chem may have already collected in response to monitor high alarms). |

U-1 isotopic results \_\_\_\_\_ uCi/cc.

U-2 isotopic results \_\_\_\_\_ uCi/cc.

ATTACHMENT 1  
(continued)

2. DETERMINE the maximum stack flow for each stack during the release period by either (a) or (b) as listed in priority:

- a. OBTAIN stack flow data for the period of the release from the 'Point History' program using the computer point IDs below:

U1 Point History Program (U1 Stack "Y9111" and U2 Stack "Y9115")

OR

U2 Point History Program (U1 Stack "Y9115" and U2 Stack "Y9111")

RECORD for each applicable stack the flow rate yielding the highest flow for any one minute interval during the release period AND calculate the flow rate in cc/sec.

U1 \_\_\_\_\_ cfm \* 472 = \_\_\_\_\_ cc/sec U1

U2 \_\_\_\_\_ cfm \* 472 = \_\_\_\_\_ cc/sec U2

- b. RECORD the number of operating Aux Building exhaust fans for the period of the release for each applicable unit And CALCULATE the stack flow rate in cc/sec.

U1 (\_\_\_\_\_) \* (67,000 cfm/fan) \* 472 = \_\_\_\_\_ cc/sec U1  
# fans

U2 (\_\_\_\_\_) \* (67,000 cfm/fan) \* 472 = \_\_\_\_\_ cc/sec U2  
# fans

3. CALCULATE the total release rate for the combined vent stacks. Use the release concentrations from section 1 and the stack flow rates from section 2.

U1 (concentration \_\_\_\_\_ uCi/cc) \* (flow \_\_\_\_\_ cc/sec) = \_\_\_\_\_ uCi/sec

U2 (concentration \_\_\_\_\_ uCi/cc) \* (flow \_\_\_\_\_ cc/sec) = \_\_\_\_\_ uCi/sec

4. After initial calculations are performed, Rad Chem should re-perform release rate determinations (the maximum release rate during the release) using available isotopic analyses.

\_\_\_\_\_  
Name/Date

## ATTACHMENT 2

### Fuel Building Release Rate Determination (0RT-PR30)

1. Determine the maximum release concentration out the fuel building ventilation pathway using one of the following methods (a) or (b):
  - a. If 0RT-PR30A (noble gas) is operable, Then, document the release concentration using 0RT-PR30A data. Use the maximum recorded value during the period of the release.  
0RT-PR30A reading \_\_\_\_\_ uCi/cc.
  - b. If 0RT-PR30A is inoperable, Then, OBTAIN and document isotopic data from 0RT-PR30A for the highest level possible during the release (notify Rad Chem to collect and analyze or use data Rad Chem may have already collected in response to monitor high alarms).  
Fuel building ventilation isotopic results \_\_\_\_\_ uCi/cc.
2. CALCULATE the maximum fuel building release rate using the release concentration determined in section 1.  
Release concentration \_\_\_\_\_ uCi/cc \*  $7.1 \text{ E}^{+6} \text{ cc/sec}$  = \_\_\_\_\_ uCi/sec.
3. After initial calculations are performed, Rad Chem should re-perform release rate determinations (the maximum release rate during the release) using available isotopic analyses.

\_\_\_\_\_  
Name/Date

## ATTACHMENT 3

### Total Station Release Rate Determination

1. DOCUMENT the release rates for the vent stack pathways calculated on Attachment 1 and the fuel building pathway calculated on Attachment 2.

U1 stack release rate \_\_\_\_\_ uCi/sec.

U2 stack release rate \_\_\_\_\_ uCi/sec.

Fuel building release rate \_\_\_\_\_ uCi/sec.

2. CALCULATE the total station release rate.

U1 stack release rate \_\_\_\_\_ uCi/sec.

+

U2 stack release rate \_\_\_\_\_ uCi/sec.

+

Fuel building release rate \_\_\_\_\_ uCi/sec.

= \_\_\_\_\_ uCi/sec total station release rate

3. COMPARE the total station release rate to the release rate limits listed in EALs
4. Rad Chem should perform offsite dose assessments based on available release data.

# CONTAMINATED INJURY RESPONSE

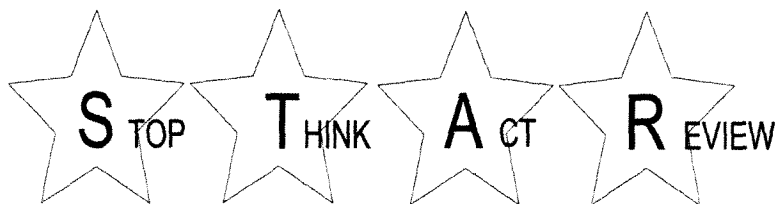
**March 13, 2006**

**Zion Station**

**UNIT 1, 2 AND COMMON**

Summary of Changes in this Revision:

- Eliminate guidance associated with the declaration of an emergency classification per DSEP, Revision 8.



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## CONTAMINATED INJURY RESPONSE

### A. PURPOSE

This procedure provides guidance for first aid and decontamination of contaminated/injured individuals.

### B. SCOPE

This procedure is used by the Shift Supervisor/Emergency Director when a injury is reported and the individual is found to also be contaminated.

### C. REFERENCES

1. ZRP 5720-4, "Routine Personnel Decontamination".
2. Victory Memorial Hospital Radiation Emergency Response Manual
3. DSEP Section 6.4.7.

### D. PREREQUISITES

1. Emergency treatment shall be provided by personnel knowledgeable in first aid techniques.



E. PRECAUTIONS

1. Unnecessary exposure to radiation should be avoided. Under emergency conditions, the risk of exposure to the rescue team should be balanced against the contribution being made toward the health and safety of the injured individual.
2. Life-saving first aid should not be withheld because of the radiation hazard to the rescue team arising solely from the radiological condition of the injured individual.
3. First Aid is the first priority. Decontamination is the second priority.
4. Decontamination of serious wounds will be performed by a Medical Doctor.
5. Whenever possible, attending personnel shall be provided protective clothing.

F. LIMITATIONS AND ACTIONS

None

G. PROCEDURE

1. Personnel discovering the injured individual shall immediately notify the Control Room.

Shift Supervisor

2. Notify Radiation Protection providing the number and nature of the injuries, the location and radiological conditions.

First Aid Responders

3. Administer first aid.
4. Evacuate the injured individual considering first aid requirements and radiological conditions.
  - a. Personnel with minor injuries should be evacuated to the First Aid/Decontamination Room or other designated location.
  - b. Personnel with serious injuries should be evacuated to the First Aid/Decontamination Room or other designated location only if the individual's health and safety are threatened by radiological conditions at the scene. Consider temporary shielding.
  - c. Personnel evacuated on a stretcher will be strapped in. A scoop stretcher is preferred.
5. Advise the Shift Supervisor/Emergency Director of the need and/or urgency of offsite medical assistance.
6. Survey the individual and document contamination levels using Attachment A and B.
7. Perform decontamination per ZRP 5720-04 considering the nature and extent of the injuries.

G. PROCEDURE (Continued)

Supervisor/Emergency Director

8. Arrange for local ambulance service if requested by the First Aid Responder at the scene. Assign at least one Radiation Protection Technician to accompany the individual to the hospital.
  - a. Notify Security that an ambulance is responding to the site, the desired point of access to the site, and the location where the individual is to be transferred to the ambulance personnel.
9. Call the hospital as soon as it is suspected that a contaminated person may require treatment providing the number of individuals, suspected injuries and status of contamination.

**NOTE**

**The initial call should not be delayed pending collection of information.**

10. Assign at least one Radiation Protection Technician to accompany the individual to the hospital.
11. When the individual is leaving the site in the ambulance, make a notification call to the hospital providing the latest known information and the expected arrival time at the hospital.

Security

12. Provide escorts for the ambulance personnel at all times while within the Security Area (Spent Fuel Nuclear Island). Guidance provided in SY-DC-101-114.

ATTACHMENT A  
PATIENT RADIATION AND MEDICAL STATUS RECORD LOG

NAME OF PATIENT \_\_\_\_\_

AGE: \_\_\_\_\_ YR.

LOCATION OF INCIDENT \_\_\_\_\_

DATE AND TIME OF INCIDENT \_\_\_\_\_

SUMMARY OF INCIDENT \_\_\_\_\_

INSTRUMENT MODEL & SERIAL # \_\_\_\_\_

PROBE MODEL & SERIAL # \_\_\_\_\_

TECHNICIAN SIGNATURE: \_\_\_\_\_

TYPE OF EXPOSURE / INJURY			
WOUNDS (YES OR NO)	EXTERNAL EXPOSURE (YES OR NO)	SKIN CONTAMINATION (YES OR NO)	INTERNAL CON. (YES OR NO)
WHERE? INDICATE HOW SERIOUS? _____ _____ _____ _____	WHERE? WHOLE BODY (YES OR NO) EXPOSURE ESTIMATE _____ rem LOCAL EXPOSURE ESTIMATE _____ rem TYPE: $\beta$ $\gamma$ NEUTRON	WHERE: TYPE OF CONTAMINATION: MIXED FISSIONPRODUCT _____ OTHER _____ _____	HOW? WOUNDS/INGESTION/ INHALATION HOW MUCH? _____ TYPE OF CONTAMINATION: MIXED FISSION PRODUCTS OTHER _____
MEASURES TAKEN			
TIME: FIRST AID: _____ _____ _____ WOUND DECON: _____ _____ EFFECT: _____ _____ _____	TIME: SYMPTOMS? NAUSEA _____ YES/NO VOMITING _____ YES/NO SKIN ERYTHEMA _____ YES/NO OTHER _____ TREATMENT GIVEN? _____ _____ BADGE TAKEN _____ NEUTRON IRRADIATION ONLY: RING TAKEN: YES/NO BUTTONS, HAIR, NAIL CLIPPINGS TAKEN? YES/NO	TIME: DECON: TECHNIQUE _____ _____ _____ EFFECT _____ _____ _____	TIME: NOSE BLOW: YES/NO SAMPLE KEPT: YES/NO DECON OF ORIFICES: WHERE? _____ HOW? _____ OTHER SAMPLES TAKEN: URINE (YES/NO) _____ FECES (YES/NO) _____ OTHER _____

Comments: \_\_\_\_\_  
\_\_\_\_\_

Reviewed by: \_\_\_\_\_

Date: \_\_\_\_\_

ATTACHMENT B

Indicate contaminated areas as to location, degree of  
contamination, and decon method. Survey Inst. Type/#



Indicate location of wounds.

