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10 CFR 50.4
10 CFR 50 Appendix E

RS-10-082

April 29, 2010

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 Procedure

In accordance with the requirements of 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," Exelon Generation Company, LLC (EGC) is submitting Revision 12 to the Defueled Station Emergency Plan (DSEP) and changes to the following Emergency Plan Implementing Procedure (EPIP) for Zion Nuclear Power Station:

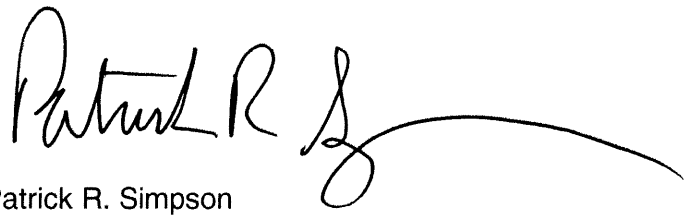
Procedure No.	Revision	Title
EPIP-07	7	Calculation of Station Noble Gas and Particulate Release Rate to Determine DSEP Classification

These changes were evaluated under the requirements of 10 CFR 50.54(q) and were determined not to result in a decrease in the effectiveness of the DSEP. The revised DSEP and EPIP were implemented on April 13, 2010, and are being submitted within 30 days of implementation as required by 10 CFR 50, Appendix E.

Attachment 1 provides Revision 12 of the Defueled Station Emergency Plan (DSEP).
Attachment 2 provides Revision 7 of EPIP-07.

There are no commitments in this letter. If you have any questions concerning this letter, please contact Amy Hambly at (630) 657-2808.

Respectfully,



Patrick R. Simpson
Manager – Licensing

Attachments:

1. Revision 12, "Zion Nuclear Power Station, Defueled Station Emergency Plan (DSEP)"
2. EPIP-07, Revision 7, "Calculation of Station Noble Gas and Particulate Release Rate to Determine DSEP Classification"

Attachment 1

"Defueled Station Emergency Plan (DSEP)"

Revision 12

April 13, 2010

Revision 12

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 Vista Medical Center East 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

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

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.

DEFUELED STATION EMERGENCY PLAN

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

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.

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

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 Defueled Emergency Response Organization (DERO).

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 DERO.

DEFUELED STATION EMERGENCY PLAN

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 DERO 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 within four hours at an Alert classification or at the discretion of the Emergency Director for an Unusual Event. The minimum augmented staff is a Radiation Protection Director and a Technical Director. An on call duty team will be the augmented staff.

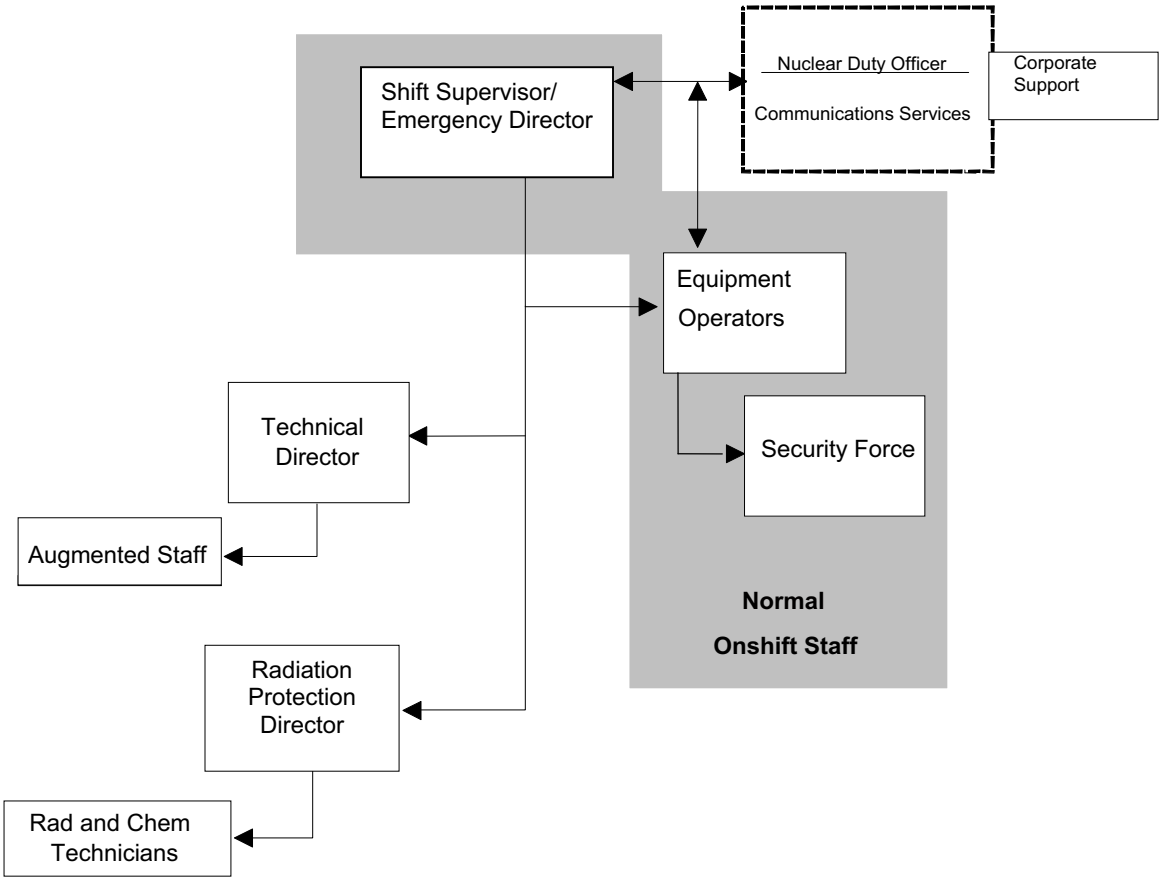
The Shift Supervisor assumes the responsibilities of the Emergency Director. The Shift Supervisor position is required to be staffed at all times. Additional personnel available to the shift are governed by approved Technical Specifications.

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. Corporate support will be coordinated through the NDO or designee.

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 (minimum staff)

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 (minimum staff)

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
- 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 RadChem personnel
- Establish and monitor Radiologically Controlled Areas (RCAs)
- On-Site 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.

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
-
- 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.

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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.

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

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

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.

DEFUELED STATION EMERGENCY PLAN

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
ABNORMAL RAD LEVELS / EFFLUENTS	
RA1 (p.17) UNPLANNED release of gaseous or liquid radioactivity to the environment ≥ 200 times the Technical Specification Release Limit for ≥ 15 Minutes.	**RU1** (p.18) UNPLANNED release of gaseous or liquid radioactivity to the environment ≥ 2 times the Technical Specification Release Limit for ≥ 60 Minutes.
RA2 (p.19) UNCONTROLLED increase in plant radiation levels that impedes operations.	**RU2** (p.20) UNCONTROLLED increase in plant radiation levels.
SYSTEM MALFUNCTIONS	
	MU1 (p.21) Decrease in Spent Fuel Pool level OR temperature increase that is not the result of a planned evolution.
HAZARDS AND OTHER CONDITIONS	
HA1 (p.22) Confirmed Security Event in the Fuel Building.	**HU1** (p.23) Confirmed security event with potential loss of level of safety of the plant.
HA2 (p.24) Other conditions judged warranting declaration of ALERT.	**HU2** (p.25) Other conditions judged warranting declaration of an UNUSUAL EVENT.
	HU3 (p26) Natural OR destructive phenomena inside the Restricted Area affecting the ability to maintain spent fuel integrity.

DEFUELED STATION EMERGENCY PLAN

RA1

Initiating Condition -- ALERT

UNPLANNED release of gaseous or liquid radioactivity to the environment ≥ 200 times the Technical Specification Release Limit for ≥ 15 Minutes.

Emergency Action Levels Threshold Values: (1 or 2)

1. UNPLANNED VALID reading on any effluent monitor that is ≥ 200 times the Technical Specification Release Limit for ≥ 15 Minutes.

2. Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates, for ≥ 15 minutes and ≥ 200 times (site –specific the Technical Specifications limits).

Basis:

An 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 cannot 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.

The EAL 1 release rate limit ensures compliance with 10CFR20.1301 dose limits to the public. For noble gas release rates, 200 times the Technical Specification limit equals 6.8E+05 μCi/sec. For particulate release rates, 200 times the Technical Specification limit equals 248 μCi/sec. For liquid effluent release rates, 200 times the Technical Specification limit equals 2000 times the value specified in Table 2 of 10CFR20, Appendix B.

The EAL 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.

Termination / Recovery Considerations

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

DEFUELED STATION EMERGENCY PLAN

RU1

Initiating Condition -- UNUSUAL EVENT

UNPLANNED release of gaseous or liquid radioactivity to the environment ≥ 2 times the Technical Specification Release Limit for ≥ 60 Minutes.

Emergency Action Levels Threshold Values: (1 or 2)

1. UNPLANNED VALID reading on any effluent monitor that is ≥ 2 times the Technical Specification Release Limit for ≥ 60 Minutes.

2. Grab sample results indicate UNPLANNED gaseous release rates or liquid concentrations ≥ 2 times the Technical Specification Release Limit for ≥ 60 Minutes.

Basis:

An 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 cannot 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.

The EAL 1 limit ensures compliance with 10CFR20.1301 dose limits to the public. For noble gas release rates, two times the Technical Specification limit equals 6.8E+03 μCi/sec. For particulate release rates, two times the Technical Specification limit equals 2.48 μCi/sec. For liquid effluent release rates, two times the Technical Specification limit equals 20 times the value specified in Table 2 of 10CFR20, Appendix B.

The EAL 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.

Termination / Recovery Considerations

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

DEFUELED STATION EMERGENCY PLAN

RA2

Initiating Condition -- ALERT

UNCONTROLLED increase in plant radiation levels that impede operations

Emergency Action Levels Threshold Value:

1. Area Radiation Monitor readings or survey results indicate an UNCONTROLLED increase in radiation level by 100 mR/hr that is not the result of a planned evolution and impedes access to areas needed to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity.

    - Auxiliary Building
    - Fuel Building
    - Radwaste Annex
    - Unit 1 and Unit 2 Containments(Site-specific) list

Basis:

An increase in radiation levels that is not the result of a planned evolution that impedes operations necessary to maintain control of radioactive material or allow maintenance of spent fuel integrity warrants the classification of an ALERT.

Damage to spent fuel represents a substantial degradation in the level of safety of the plant and therefore warrants an ALERT classification.

Termination / Recovery Considerations

The source of the increased radiation is determined and levels have decreased below the threshold value.

DEFUELED STATION EMERGENCY PLAN

RU2

Initiating Condition -- UNUSUAL EVENT

UNCONTROLLED increase in plant radiation levels.

Emergency Action Level Threshold Value:

1. Area Radiation Monitor readings or survey results indicate an uncontrolled increase in radiation level by 25 mR/hr that is not the result of a planned evolution.

Basis:

UNCONTROLLED means an increase in < 12 hours of monitored radiation level that is not the result of a planned evolution and the source of the increase is not immediately recognized and controlled.

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 level has been determined and levels have decreased to below the threshold value. Radiological controls have been implemented and are effective.

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MU1

Initiating Condition -- UNUSUAL EVENT

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

Emergency Action Levels Threshold Values: (1 or 2)

1. a. An uncontrolled water level decrease in spent fuel pool to < 611 feet with all irradiated fuel assemblies remaining covered by water.

AND

b. UNPLANNED VALID Fuel Building Area Radiation Monitor 0RT-AR21 or 0RT-AR22 reading increases to > 15 mR/hr

2. Spent Fuel Pool temperature increase to > 125 ^{o}F that is not the result of a planned evolution.

Basis:

Classification of an Unusual Event for the EAL threshold value is warranted as a precursor to more serious events and a potential degradation in the level of safety of the plant. Since loss of level or continued pool boiling would result in increased radiation levels exceeding the criteria of RA2, continued system related loss of level type events are bounded by RA2.

Termination / Recovery Considerations

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

DEFUELED STATION EMERGENCY PLAN

HA1

Initiating Condition -- ALERT

Confirmed Security Event in the Fuel Building.

Emergency Action Levels Threshold Values:

1. INTRUSION into the Fuel Building by a HOSTILE FORCE.

Basis:

This class of security event represents an escalated threat to plant safety above that contained in the UNUSUAL EVENT. A confirmed INTRUSION report is satisfied if physical evidence indicates the presence of a HOSTILE FORCE within the Fuel Building.

Termination / Recovery Considerations

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

DEFUELED STATION EMERGENCY PLAN

HU1

Initiating Condition -- UNUSUAL EVENT

Confirmed Security Event with potential loss of level of safety of the plant.

Emergency Action Levels Threshold Values: (1 or 2)

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

2. A CONFIRMED threat that meets ALL of the following criteria:

   - A credible threat reported by any other outside agency or security procedures.
   - Is specifically directed toward the station
   - Is IMMINENT

Basis:

This EAL is based on Zion Station Site Security Plans. Security events, which do not represent a potential degradation in the level of safety of the plant, are reported under 10CFR73.71 or in some cases under 10CFR50.72.

INTRUSION into the Fuel Building by a HOSTILE FORCE would result in EAL escalation to an ALERT.

Consultation with security shift supervision is required because these individuals are the designated personnel on-site qualified and trained to confirm that a security event is occurring or has occurred. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the plant Security Plan.

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

Confirmed – Determination that the threat or event is actual

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.

Termination / Recovery Considerations

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

DEFUELED STATION EMERGENCY PLAN

HA2

Initiating Condition -- ALERT

Other conditions judged warranting declaration of ALERT.

Emergency Action Levels Threshold Values:

1. Other conditions exist which in the judgment of the Emergency Director indicate that plant systems may be substantially degraded and that increased monitoring of plant functions is warranted. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

Basis:

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

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

DEFUELED STATION EMERGENCY PLAN

HU2

Initiating Condition -- UNUSUAL EVENT

Other conditions judged warranting declaration of an UNUSUAL EVENT

Emergency Action Levels Threshold Values:

1. Other conditions exist which in the judgment of the Shift Supervisor / Emergency Director indicates a potential degradation in the level of safety of the plant.

Basis:

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 judgment 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

HU3

Initiating Condition -- UNUSUAL EVENT

Natural or destructive phenomena inside the RESTRICTED AREA affecting the ability to maintain spent fuel integrity

Emergency Action Levels Threshold Values: (1 or 2 or 3 or 4 or 5 or 6 or 7)

1. CONFIRMED Seismic event felt by plant personnel.

2. Report by plant personnel of tornado or high winds greater than 80 mph striking within the RESTRICTED AREA that has the potential to affect equipment needed to maintain spent fuel integrity.

3. Vehicle crash into plant structures or systems within the RESTRICTED AREA boundary that has the potential to affect equipment needed to maintain spent fuel integrity.

4. Report by plant personnel of an unanticipated EXPLOSION within the RESTRICTED AREA boundary resulting in VISIBLE DAMAGE that has the potential to affect equipment needed to maintain spent fuel integrity.

5. Uncontrolled flooding in the Fuel Building that has the potential to affect equipment needed to maintain spent fuel integrity.

6. FIRE in the Fuel Building not extinguished within 15 minutes of Control Room notification or verification of a control room alarm that has the potential to affect equipment needed to maintain spent fuel integrity.

7. Toxic or flammable gas within the RESTRICTED AREA that has the potential to affect the operation of equipment needed to maintain spent fuel integrity.

Basis:

Unusual Events in this IC are categorized on the basis of the occurrence of an event of sufficient magnitude to be of concern to plant operators. Areas identified in the EALs define the location of the event based on the potential for damage to equipment contained therein.

EAL #1 should be CONFIRMED by a call to the National Earthquake Center. Damage may be caused to some portions of the site, but should not affect ability to operate spent fuel pool equipment. Method of detection can be based on validation by a reliable source or operator assessment. As defined in the EPRI-sponsored "Guidelines for Nuclear Plant Response to an Earthquake", dated October 1989, a "felt earthquake" is:

An earthquake of sufficient intensity such that: (a) the vibratory ground motion is felt at the nuclear plant site and recognized as an earthquake based on a consensus of control room operators on duty at the time.

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EAL #2 is based on the assumption that a tornado striking (touching down) or high winds within the restricted area may have potentially damaged plant structures containing functions or systems required to maintain spent fuel integrity. The high wind value in EAL#2 is based on the FDSAR 100-year design basis value. “Sustained” means for more than 60 minutes.

EAL #3 is intended to address crashes of vehicles that cause significant damage to plant structures containing functions and systems necessary to maintain spent fuel integrity.

EAL #4 addresses only those EXPLOSIONs of sufficient force to damage equipment needed to maintain spent fuel integrity. No attempt is made in this EAL to assess the actual magnitude of the damage. The occurrence of the EXPLOSION with reports of evidence of damage is sufficient for declaration. The Emergency Director also needs to consider any security aspects of the EXPLOSION, if applicable.

EAL #5 addresses the effect of flooding caused by internal events such as component failures or equipment misalignment that has the potential to affect equipment needed to maintain spent fuel integrity. The site-specific areas include those areas that contain systems required to maintain fuel integrity that are not designed to be wetted or submerged.

EAL #6 addresses FIREs that may have the potential to affect the ability to maintain spent fuel integrity. As used here, *Detection* is visual observation and report by plant personnel or sensor alarm indication. The 15-minute time period begins within a credible notification that a FIRE is occurring, or indication of a VALID fire detection system alarm. Verification of a VALID fire detection system alarm includes actions that can be taken with the control room or within the Fuel Building to ensure that the alarm is not spurious. A verified alarm is assumed to be an indication of a FIRE unless it is disproved within the 15-minute period by personnel dispatched to the scene. In other words, a personnel report from the scene may be used to disprove a sensor alarm if received within 15 minutes of the alarm, but shall not be required to verify the alarm.

The intent of this 15-minute duration is to size the FIRE and to discriminate against small FIREs that are readily extinguished (e.g., smoldering waste paper basket). This excludes FIREs within administration buildings, wastebasket FIREs, and other small FIREs of no safety consequence.

EAL #7 addresses toxic or flammable gas in the restricted area that has the potential to affect the ability to maintain spent fuel integrity due to the potential damage to equipment or the evacuation of personnel preventing operation or maintenance of spent fuel pool equipment.

Escalation to the ALERT level will be via RA2 if any of the above events has caused damage that results in radiation levels increasing by 100 mR/hr and impedes operation of systems needed to maintain spent fuel integrity.

Termination / Recovery Considerations

EAL #1 – No further hazard exists and a damage assessment, per EPRI NP-6695, Guidelines for Nuclear Plant Response to an Earthquake, is in progress.

EAL #2, #3, #4, #5 & #7 - No further hazard exists and a damage assessment is in progress.

EAL #6 – The fire is extinguished and the operational impact of the fire has been evaluated

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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.

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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 on-site 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.

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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 RADIOLOGICALLY CONTROLLED AREAS (RCAs)

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

6.4.3 EXPOSURE CONTROL

Individuals authorized to enter RCAs 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 Vista Medical Center East 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.

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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.

7.2 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.
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.

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 ventilation exhaust from Zion Station Auxiliary Building is reduced to two effluent streams. Each stream provides a readily available sampling pathway for effluent quantification.

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

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.

7.3.2.4 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 Defueled Emergency Response Organization (DERO) 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 Regional 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.

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
- On-Site 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 DERO.

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 EPIPs and lesson plans are maintained current, the EPC shall ensure the following:

- DSEP and EPIPs 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 EPIP. 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 EPIPs;
- 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 EPIPs, such documents shall be revised as necessary to ensure corrective action,
- Letters of Agreement or contracts for services.

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 2

EPIP-07

"Calculation of Station Noble Gas and Particulate Release Rate to Determine DSEP Classification"

Revision 7

CALCULATION OF STATION NOBLE GAS AND PARTICULATE RELEASE RATE TO DETERMINE DSEP CLASSIFICATION

April 13, 2010

Zion Station

UNIT 1, 2 AND COMMON

Summary of Changes in this Revision:

- Revised procedure to reflect that the Fuel Building is aligned to Auxiliary Building ventilation.

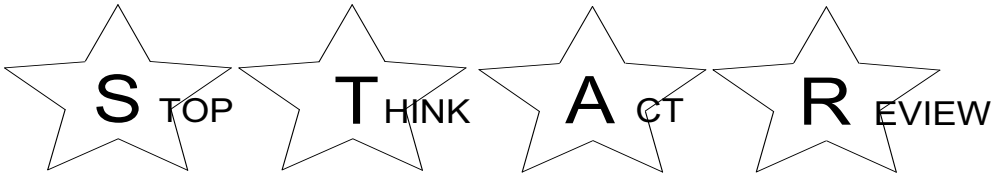


Table of Contents

A. PURPOSE

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

B. SCOPE

Applies to personnel assessing unplanned station radioactive releases.

C. REFERENCES

1. Section 5.0 of the DSEP, Classification of Emergencies

D. PREREQUISITES

None

E. PRECAUTIONS

None

F. LIMITATIONS AND ACTIONS

1. The Operating Staff should obtain RadChem 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 and particulate filters 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 completed, Then RadChem 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.

G. MAIN BODY – RELEASE QUANTIFICATION

1. Vent Stack Pathway

    1.1. DETERMINE the release concentration out the U2 stack pathway And USE Attachment 1 to determine the stack noble gas release rate. Use Attachment 4 to determine the stack particulate release rate.

        1.1.1. If 2RIA-PR49 SPING is operable, Then, USE the channel 5 value on Attachment 1 as the stack noble gas release concentration.

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

        1.1.3. If 2RIA-PR49 SPING is operable, Then USE the channel 1 value on Attachment 4 as the stack particulate release concentration.

        1.1.4. If the SPING is inoperable, Then obtain and analyze the channel 1 particulate filter from the SPING. Use the isotopic result on Attachment 4 as the stack release concentration.

2. Fuel Building Pathway (N/A if Fuel Building is aligned to Auxiliary Building ventilation)

    2.1. DETERMINE the release concentration out the fuel building ventilation pathway And USE Attachment 2 to determine fuel building noble gas release rate. Use Attachment 5 to determine the fuel building particulate release rate.

        2.1.1. If 0RT-PR30A is operable, Then, use the monitor value on Attachment 2 as the fuel building noble gas release concentration.

        2.1.2. If 0RT-PR30A is inoperable, Then, obtain and analyze a noble gas sample from 0RT-PR30A. Use the isotopic results on Attachment 2 as the fuel building release concentration.

        2.1.3. If 0RT-PR30B is operable, Then use the monitor value on Attachment 5 as the fuel building particulate release concentration.

2.1.4. If 0RT-PR30B is inoperable, Then obtain and analyze the monitor particulate filter. Use the isotopic results on Attachment 5 as the fuel building particulate release concentration.

3. Total Station Release

   3.1. COMPLETE Attachment 3. Sum attachments 1 and 2 to determine the total station noble gas release rate.

   3.2. COMPLETE Attachment 6. Sum Attachments 4 and 5 to determine the total station particulate release rate.

   3.3. Compare the total station release rate to release rate limits in Section 5.0 of the DSEP

   3.4. 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, RadChem should obtain and analyze noble gas samples and particulate filters from the affected release pathways.

   4.2. RadChem should recalculate release rates using available isotopic analysis.

   4.3. RadChem should CALCULATE And DOCUMENT total activity released for inclusion in applicable effluent release reports.

ATTACHMENT 1

Vent Stack Noble Gas Release Rate Determination

(2RIA-PR49)

1. Determine the maximum noble gas release concentration out the U2 stack pathway using step (1.1) or (1.2):

   1.1 If SPING channel 5 is operable, Then document the maximum U2 stack noble gas concentration using one of the following methods:

      1.1.1 Obtain "U2 Stack Noble Gas Lo Rang" reading from the 2RIA-PR49 PI Process Book.

      1.1.2 At the SPING control terminal select 'Hist Min', key in '01-05' select 'enter', select '+/↑' to review the one-minute averages for the previous 24 minutes of history, and record the highest available reading.

      1.1.3 If the SPING printer is available, Then, at the SPING control terminal, use the 'Hist Min' command to print the most recent one-minute averages for channel 5. Record the highest reading for channel 5.

      U-2 stack noble gas concentration _____ μCi/cc.

   1.2 If SPING is inoperable, Then, OBTAIN and document isotopic data for the highest level possible during the release. (Notify RadChem to collect and analyze a gas grab sample or use data RadChem may have already collected in response to monitor high alarms).

      U-2 stack noble gas isotopic results _____ μCi/cc.

ATTACHMENT 1
(continued)

2. DETERMINE the maximum U2 stack flow during the release period using step (2.1) or (2.2) as listed in priority:

   2.1 OBTAIN "U2 stack flow" data for the period of the release from the 2RIA-PR49 PI Process Book.

   RECORD the U2 stack flow rate yielding the highest flow for any one-minute interval during the release period AND calculate the flow rate in cc/sec.

   U2 _____ cfm * 472 = _____cc/sec

   2.2 RECORD the number of operating U2 Aux Building exhaust fans for the period of the release And CALCULATE the stack flow rate in cc/sec.

   U2 (_____) * (67,000 cfm) * 472 = _____cc/sec
   # fans

3. CALCULATE the noble gas release rate for the U2 vent stack.

   U2 (concentration _____μCi/cc) (from step 1.1 or 1.2) *

   (flow _____cc/sec) (from step 2.1 or 2.2) = _____μCi/sec

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

   _____
   Name/Date

ATTACHMENT 2

Fuel Building Noble Gas Release Rate Determination (0RT-PR30A) (N/A this section if Fuel Building is aligned to Auxiliary Building ventilation)

1. Determine the maximum noble gas release concentration out the fuel building ventilation pathway using step (1.1) or (1.2):

   1.1 If 0RT-PR30A (noble gas) is operable, Then, document the release concentration using 0RT-PR30A data from the DAS display or the "Rad Monit – Noble Gas" reading from the SFNI DAS PI Process Book.. Use the maximum recorded voltage reading during the period of the release, and convert to μCi/cc using Attachment 7.

   0RT-PR30A voltage reading _____volts

   0RT-PR30A concentration _____μCi/cc.

   1.2 If 0RT-PR30A is inoperable, Then, OBTAIN and document isotopic data from 0RT-PR30A for the highest level possible during the release (notify RadChem to collect and analyze a gas grab sample or use data RadChem may have already collected in response to monitor high alarms).

   Fuel building ventilation isotopic results _____μCi/cc.

2. CALCULATE the maximum fuel building noble gas release rate.

   Release concentration _____μCi/cc (from step 1.1 or 1.2)

   * 7.1 E+06 cc/sec = _____μCi/sec.

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

_____
Name/Date

ATTACHMENT 3

Total Station Noble Gas Release Rate Determination

1. CALCULATE the total station noble gas release rate.

   U2 stack noble gas release rate _____μCi/sec. (from Att. 1 step 3.)

   +

   Fuel building noble gas release rate _____μCi/sec. (from Att. 2 step 2.) (N/A if Fuel Building is aligned to Auxiliary Building ventilation)

   = _____μCi/sec total station noble gas release rate

2. COMPARE the total station noble gas release rate to the release rate limits listed in EALs

ATTACHMENT 4

Vent Stack Particulate Release Rate Determination

(2RIA-PR49)

1. Determine the maximum particulate release concentration out the Unit 2 stack pathway using step (1.1) or (1.2):

   1.1 If SPING channel 1 is operable.

   1.1.1 Document the particulate release concentration using one of the following methods:

   1.1.1.1 Obtain “U2 Stack Beta Particulate” reading from the 2RIA-PR49 PI Process Book.

   1.1.1.2 At the SPING control terminal select ‘Hist Min’, key in ’01-01’, select ‘enter’, select ‘+/↑’ to review the one-minute averages for the previous 24 minutes of history, and record the highest available reading.

   1.1.1.3 If the SPING printer is available, Then, at the SPING control terminal, use the ‘ Hist Min’ command to print the most recent one-minute averages for channel 1. Record the highest reading.

   U-2 Channel 1 reading _____ cpm

   1.1.2 Calculate the corresponding activity (A) using the response conversion factor of 1.29 E+05 cpm/μCi as follows:

   A =count rate_____cpm (from step 1.1.1) ÷ 1.29 E+05 cpm/μCi =

   _____μCi

1.1.3 Obtain the channel 10 sample flow reading in cfm for 2RIA-PR49 using one of the following methods, and convert to cc/sec using the calculation below:

1.1.3.1 At the SPING control terminal select 'Hist Min', key in '01-10', select 'enter', select '+/↑' to review the one-minute averages for the previous 24 minutes of history, and record the lowest reading. If the SPING control terminal is unavailable, obtain the channel 10 sample flow reading locally at either 2RIA-PR49 or 2LP-084.

1.1.3.2 If the SPING printer is available, Then, at the SPING control terminal, use the 'Hist Min' command to print the most recent one-minute averages for channel 10. Record the lowest reading:

U-2 Channel 10 reading _____ cfm * 472 = _____ cc/sec

1.1.4 Calculate the radiation monitor sample volume (SV) based on a ten minute sample time:

SV = 600 sec. * Channel 10 flow_____ cc/sec (from step 1.1.3.) = _____cc

1.1.5 Calculate the isotopic concentration (C) assuming a filter efficiency of 95% as follows:

C = 1.05 * A _____ μCi (from step 1.1.2.) ÷ SV _____ cc (from step 1.1.4)

= _____μCi/cc

ATTACHMENT 4
continued

1.2 If SPING is inoperable, Then OBTAIN and document isotopic data for the highest level possible during the release. Notify RadChem to collect and analyze the filter paper.

RadChem should use the minimum sample flow rate observed when performing the isotopic analysis.

Sample flow _____ cfm

The duration of the event should be used as the filter exposure time. **The duration of the event will be estimated by the Shift Supervisor and provided to RadChem to use for the isotopic analysis along with the recorded sample flow.** If the event duration cannot be estimated, a conservative value of 15 minutes will be used. Record duration of event:

Duration of event _____minutes

Record U-2 vent stack particulate isotopic concentration results obtained from RadChem:

Isotopic concentration (C) results: _____ μCi/cc

ATTACHMENT 4
continued

2. DETERMINE the maximum stack flow for the U2 stack during the release period by either step (2.1) or (2.2) as listed in priority:

   2.1 OBTAIN "U2 stack flow" data for the period of the release from the 2RIA-PR49 PI Process Book.

   RECORD the U2 stack flow rate yielding the highest flow for any one-minute interval during the release period AND calculate the flow rate in cc/sec.

   U2 _____ cfm * 472 = _____cc/sec

   2.2 RECORD the number of operating U2 Aux Building exhaust fans for the period of the release And CALCULATE the stack flow rate in cc/sec.

   U2 (_____) * (67,000 cfm) * 472 = _____cc/sec
   # fans

3. CALCULATE the total release rate for the U2 vent stack.

   U2 (concentration _____μCi/cc) (from step 1.1.5 or 1.2) * (flow

_____cc/sec) (from step 2.1 or 2.2) =_____ μCi/sec

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

_____
Name/Date

ATTACHMENT 5

Fuel Building Particulate Release Rate Determination

(0RT-PR30B)
(N/A this section if Fuel Building is aligned to Auxiliary Building ventilation)

1. Determine the maximum release concentration out the fuel building ventilation pathway using step (1.1) or (1.2):

   1.1 If 0RT-PR30B (particulate) is operable, Then, document the release concentration using 0RT-PR30B data from the DAS display or the "Rad Monit – Particulate" reading from the SFNI DAS PI Process Book. Use the maximum recorded voltage reading during the period of the release, and convert to μCi/cc using Attachment 8.

   0RT-PR30B voltage reading _____volts

   0RT-PR30B concentration _____μCi/cc.

   1.2 If 0RT-PR30B (particulate) is inoperable, Then OBTAIN and document isotopic data for the highest level possible during the release. Notify RadChem to collect and analyze the filter paper.

   Sample flow _____ cfm

   The duration of the event should be used as the filter exposure time. **The duration of the event will be estimated by the Shift Supervisor and provided to RadChem to use for the isotopic analysis along with the recorded sample flow.** If the duration cannot be estimated, a conservative value of 15 minutes will be used. Record duration of event:

   Duration of event _____ minutes

   Record fuel building particulate isotopic concentration results obtained from RadChem:

   Fuel building ventilation isotopic results _____μCi/cc.

ATTACHMENT 5
continued

2. CALCULATE the maximum fuel building release rate.

   Release concentration _____μCi/cc (from step 1.1 or 1.2) * 7.1 E+06 cc/sec

   = _____μCi/sec.

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

   _____
   Name/Date

ATTACHMENT 6

Total Station Particulate Release Rate Determination

1. CALCULATE the total station release rate.

   U2 stack particulate release rate _____μCi/sec. (from Att. 4 step 3.)

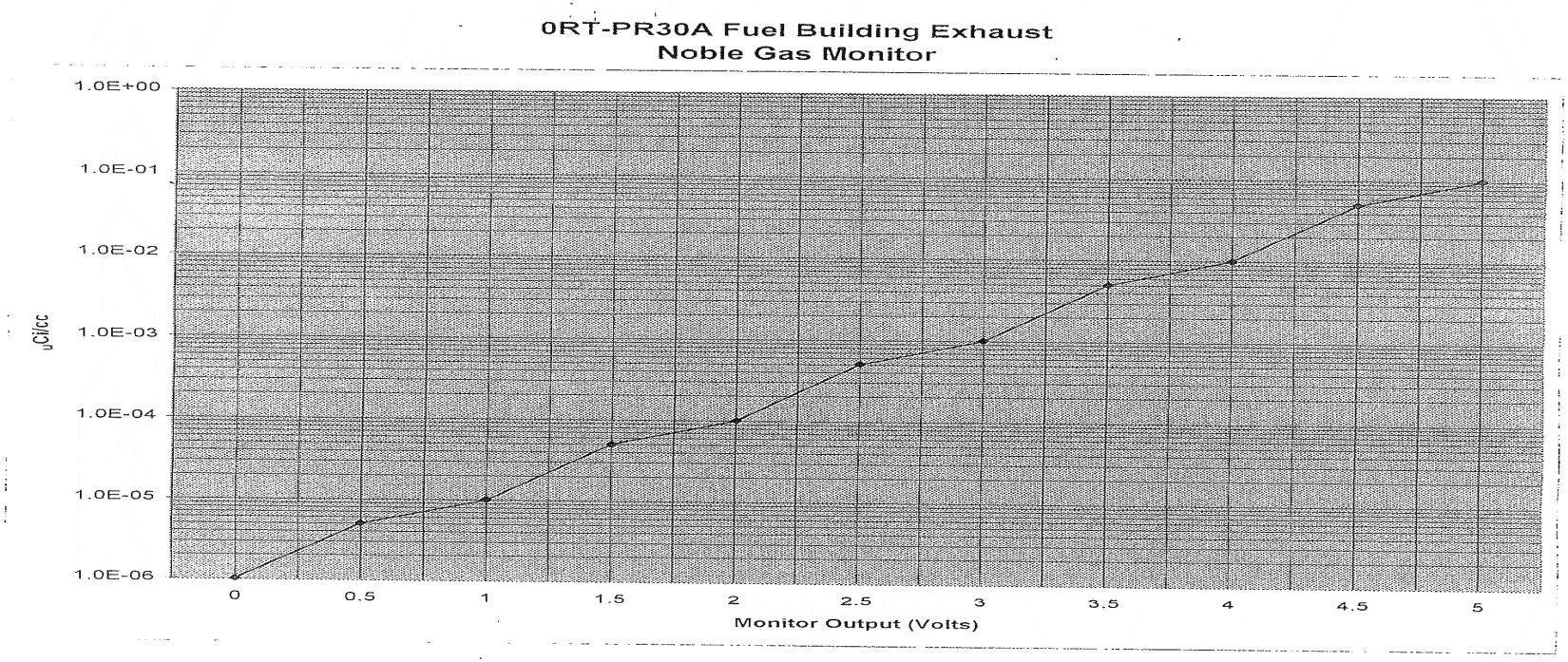
   +

   Fuel building particulate release rate _____μCi/sec. (from Att. 5 step 2.) (N/A if Fuel Building is aligned to Auxiliary Building ventilation)

   = _____μCi/sec total station particulate release rate

COMPARE the total station particulate release rate to the release rate limits listed in EALs

ATTACHMENT 7



ATTACHMENT 8