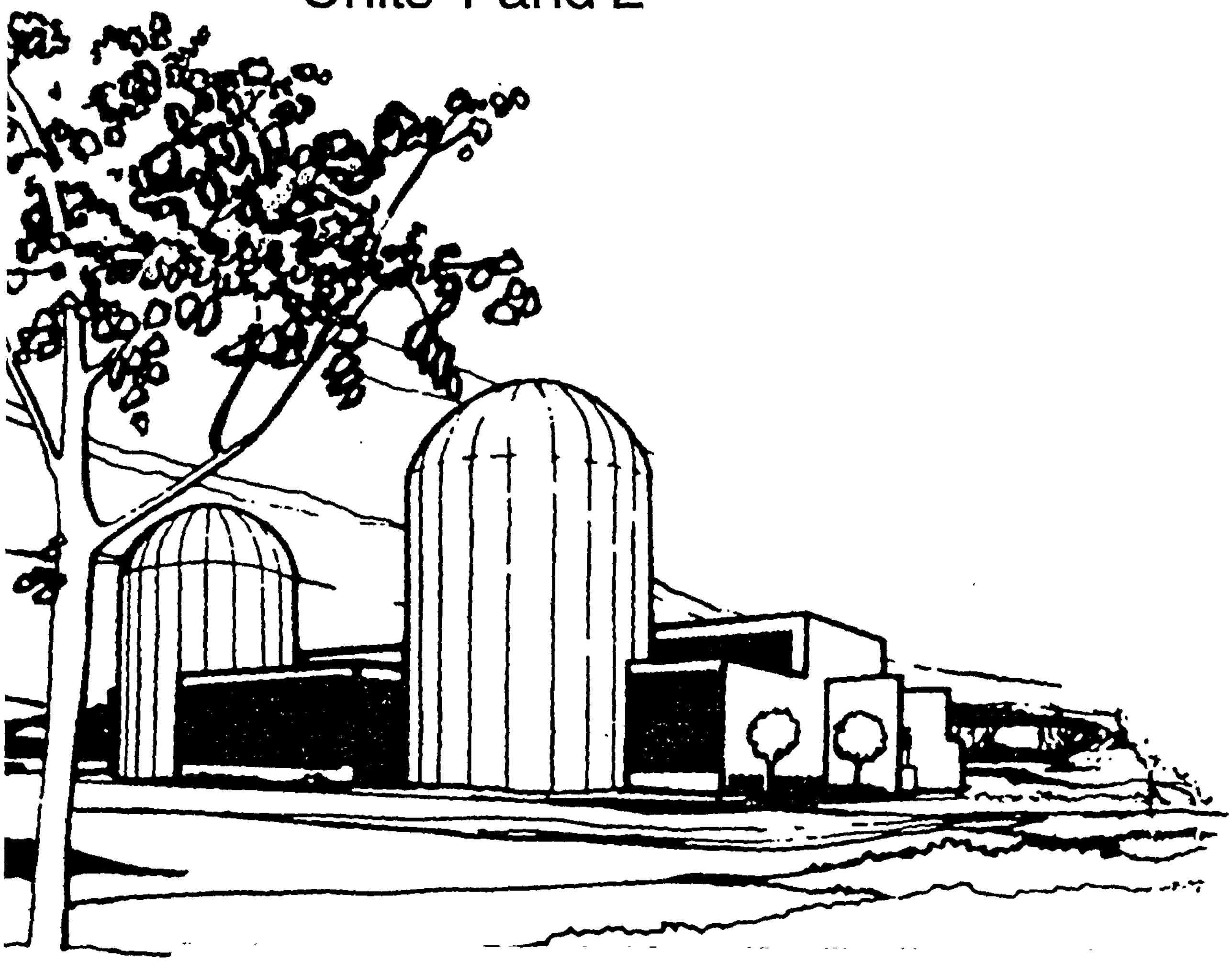
Prairie Island Nuclear Generating Plant

Welch, Minnesota
Units 1 and 2



Emergency Action Levels Revision Submittal

NMC
Committed to Nuclear Excellence

Prairie Island Nuclear Generating Plant
Operated by Nuclear Management Company, LLC

OCT 2 2 2004

L-PI-04-120
10 CFR 50, Appendix E

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

Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282, 50-306 and 72-10
License Nos. DPR-42, DPR-60 and SNM-2506

Revision to Emergency Action Levels

Nuclear Management Company, LLC, (NMC) is transmitting for Nuclear Regulatory Commission (NRC) review and approval the proposed Emergency Plan changes, upgrading the Prairie Island Nuclear Generating Plant (PINGP) emergency action levels (EALs) based on NEI 99-01, Revision 4, "Methodology for Development of Emergency Action Levels," using the guidance of Regulatory Issue Summary (RIS) 2003-18, Supplement 1, "Use of Nuclear Energy Institute (NEI) 99-01, 'Methodology for Development of Emergency Action Levels,' " dated July 13, 2004.

The enclosed security EALs are in compliance with NEI 99-01, Revision 4, but are not aligned with the "Order For Interim Safeguards and Security Compensatory Measures for Prairie Island Nuclear Generating Plant, Units 1 & 2" dated February 25, 2002. The PINGP response to that Order is dated August 30, 2002. The NRC has indicated that additional security EALs are being developed for threat advisories. If revised security EALs are issued before the enclosed EALs are approved, NMC will provide a supplement to reflect the updated security EALs. NMC intends to remain in compliance with the security EALs in the August 2002 security Order response, as modified by the threat advisories, until the NRC approves new security EALs for PINGP.

The current EAL scheme in use at PINGP is based on NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."

AX45

This request contains the following enclosures:

Enclosure 1: Table of Contents
Enclosure 2: Summary Explanation
Enclosure 3: State/Local Government Official Agreement Documentation
Enclosure 4: Marked-up NEI Technical Basis Document, Proposed Technical Basis Document, Justification Matrices, and Proposed Emergency Plan Changes
Enclosure 5: Compact disk of Enclosure 4 and References

The proposed Initiating Conditions (ICs) and EALs have been discussed and agreed to by applicable state, tribal and local government representatives, and have been reviewed by the PINGP Operations Committee.

It is requested that the enclosed Emergency Plan changes be approved by October 31, 2005.

Summary of Commitments

This letter makes the following new commitment:

> The NRC has indicated that additional security EALs are being developed for threat advisories. If revised security EALs are issued before the enclosed EALs are approved, NMC will provide a supplement to reflect the updated security EALs.

Joseph M. Solymossy
Site Vice President, Prairie Island Nuclear Generating Plant
Nuclear Management Company, LLC

Enclosures (5)

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island Nuclear Generating Plant, USNRC
Resident Inspector, Prairie Island Nuclear Generating Plant, USNRC
Office of Nuclear Material Safety & Safeguards

ENCLOSURE 1
TABLE OF CONTENTS

ENCLOSURE 2
SUMMARY EXPLANATION

In summary, this submittal provides the basis and justification for changing the Prairie Island Nuclear Generating Plant (PINGP) emergency action level (EAL) scheme from the NUREG-0654 requirements to the NEI 99-01 requirements and demonstrates compliance with 10 CFR 50.54(q).

Submittal Package Contents

This submittal includes the transmittal letter and five enclosures. The enclosures include a table of contents (Enclosure 1), this summary explanation (Enclosure 2), documentation of state, tribal and local government representative agreements (Enclosure 3), a mark-up of the NEI Technical Basis Document, the proposed Technical Basis Document, the justification matrices and the proposed Emergency Plan changes (Enclosure 4) and a compact disk containing Enclosure 4 documents and references (Enclosure 5).

Current and Proposed EAL Scheme Bases

The Site Emergency Plan for the Prairie Island Nuclear Generating Plant (PINGP) currently uses the NUREG-0654 EAL scheme. Nuclear Management Company, LLC (NMC) requests approval to change the existing scheme for PINGP to that described in NEI 99-01, Revision 4, "Methodology for Development of Emergency Action Levels," January 2003, as endorsed by the Nuclear Regulatory Commission (NRC) in Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," Revision 4, July 2003. NMC further requests that the Emergency Plan changes be approved by October 31, 2005.

State, Tribal and Local Government Official Agreements

State, tribal and local government representative agreements and supporting documentation are contained in Enclosure 3. The differences in classification between the current NUREG-0654 scheme and the proposed NEI 99-01 scheme were described in the Prairie Island EAL Comparison Matrix provided to and discussed with the representatives. The Governmental Response Organizations represented in the letters below are those listed in the PINGP Emergency Plan that have responsibility for notification and coordination of emergency response activities in the event of a major emergency at PINGP.

1) Letter from Steven Skoyen, Prairie Island Nuclear Generating Plant Emergency Preparedness Manager, to Paul Schmidt, State of Wisconsin, Radiation Protection Section, dated October 18, 2004.

2) Letter from William Clare, Planning Section Supervisor, Wisconsin Emergency Management, to Steven Skoyen, Prairie Island Nuclear Generating Plant Emergency Preparedness Manager, dated October 20, 2004.

3) Letter from Rob Roy, Emergency Preparedness Coordinator, Monticello and Prairie Island Nuclear Sites, to Daniel Whitcomb, Minnesota Division of Homeland Security and Emergency Management, dated October 18, 2004.

4) Letter from Rob Roy, Emergency Preparedness Coordinator, Monticello and Prairie Island Nuclear Sites, to Shannon Rindfleisch, Emergency Planner, Prairie Island Indian Community, dated October 18, 2004.

5) Letter from Rob Roy, Emergency Preparedness Coordinator, Monticello and Prairie Island Nuclear Sites, to Gary Brown, Emergency Manager, Pierce County (WI), dated October 18, 2004.

6) Letter from Rob Roy, Emergency Preparedness Coordinator, Monticello and Prairie Island Nuclear Sites, to Dave Gisch, Emergency Manager, Dakota County (MN), dated October 18, 2004.

7) Letter from Rob Roy, Emergency Preparedness Coordinator, Monticello and Prairie Island Nuclear Sites, to Gary Fried, Emergency Manager, Goodhue County (MN), dated October 18, 2004.

Comparison of Scheme Basis to Proposed ICs and EALs

The proposed initiating condition (IC) and EAL changes are contained in Enclosure 4. This provides the cross-reference scheme basis (NEI 99-01, Revision 4) to proposed ICs and EALs. There are four attachments within Enclosure 4. Attachment 1 contains a marked-up copy of the Technical Basis Document. This document includes the pertinent information to describe each IC and EAL (identifier, category, description, modes, basis, etc). The strikeouts (red) and added text (green) indicate changes made to the information contained in NEI 99-01, Revision 4, in order to develop site-specific ICs and EALs. All changes are described as either a difference or a deviation in Attachment 3, the detailed justification matrices. Attachment 2 contains a clean copy of the proposed Technical Basis Document and Attachment 4 contains the proposed PINGP Emergency Plan changes.

Enclosure 5 contains electronic files of the documents contained in Enclosure 4 and the associated reference documents, including a site electrical distribution system drawing. The reference sections of the electronic copy of the proposed Technical Basis Document contain cross-reference numbers that correspond to the specific electronic reference document file.

Differences and Deviations

As documented in Regulatory Issue Summary (RIS) 2003-18, Supplement 1, dated 7/13/2004, differences and deviations are defined as follows:

A *difference* is an EAL change where the basis scheme guidance (NUREG, NUMARC, NEI) differs in wording but agrees in meaning and intent, such that classification of an event would be the same, whether using the basis scheme guidance or the site-specific proposed EAL. Examples of *differences* include the use of site-specific terminology or administrative reformatting of site-specific EALs.

A *deviation* is an EAL change where the basis scheme guidance differs in wording and is altered in meaning or intent, such that classification of the event could be different between the basis scheme guidance and the site-specific proposed EAL. Examples of *deviations* include the use of altered mode applicability, altering key words or time limits, or changing words of physical reference (protected area, safety-related equipment, etc.).

Any change to an NEI EAL was reviewed to verify that the site-specific information provided was consistent with the intended EAL threshold for classification, or that any difference in wording only represented a rewording of the NEI EAL, or that the revision of the EAL was fully supported by the NEI Technical Basis guidance.

Furthermore, any change to the NEI Technical Basis guidance (deletion, addition, or rewording) was reviewed to ensure such a change would not lead to the elimination of consideration of specific aspects of the condition, or misinterpretation by the EAL user, such that the classification of the condition would remain as intended by the NEI guidance.

Where the NEI basis scheme guidance addressed limitations on capabilities due to site design, the EAL change or deletion was not considered to have been altered in meaning or intent and therefore was not characterized as a deviation. For example:

- NEI 99-01, Recognition Category A (Abnormal Rad Levels/Radiological Effluent) EALs only apply to sites with telemetered perimeter monitors. The example EALs include the statement "[for sites having telemetered perimeter monitors]".
- NEI 99-01 basis scheme guidance related to RVLIS in the Recognition Category C (Cold Shutdown/Refueling System Malfuntion) IC CS2 includes the following statement: "If a RVLIS is not available such that the PWR EAL setpoint cannot be determined, then EAL 1.b should be used to determine if the IC has been met.". Since RVLIS is not available during refueling mode, the basis scheme guidance was utilized and EALs 1.a. and 2.a. were not included.

The justification matrices provide background information on the changes in wording described above. Differences and deviations are identified in the justification matrices. The detailed justification matrix for the proposed EAL changes is contained in Enclosure 4 as Attachment 3. This matrix provides the cross-reference comparing the current NEI 99-01, Revision 4 EALs, to the proposed EALs, specific identification and discussion of differences and deviations, and mode applicability. The matrices contain justifications for differences and deviations identified in the IC's, EAL Thresholds and Basis documents. The matrices are divided into sections following the format of the Technical Basis Document, (e.g., Abnormal Rad/Effluent, Cold Shutdown, ISFSI, Fission Product Barriers, Hazards, System Malfunctions). A section identifying Generic Differences is at the front of the document. The Permanently Defueled section does not exist since both PINGP units are operating.

Overview of Deviations

No deviations are identified in the PINGP Justification Matrices.

Overview of Differences

Significant differences identified in the matrices impacting multiple EALs include the following:

1) Elimination of NEI EALs associated with plant equipment not on site - this difference is primarily associated with off-site perimeter monitoring and real time dose assessment. This affects EALs RU1#4, RU1#5, RA1#4, RA1#5, RS1#3, and RG1#3.
2) Use of "or" statement for Reactor Vessel inventory indication – PINGP utilized three indications for this classification, Containment Sump A "or" C, "or" Waste Hold Up Tank. The "or" statement was used instead of the NEI wording "and" because there would not

be simultaneous indication in all locations. This affects EALs CU2.2, CA1.2, CA2.2, CS1.1, CS1.2, and CG1.1.

3) Use of "buses" statement for loss of offsite power – PINGP utilized bus indication in the classification to focus the classification on the loss of offsite power capability rather than the status of one or more "transformers" that may or may not be capable of powering the essential buses. This affects EALS CU3.1, CA3.1, SU1.1, SS1.1, and SG1.1.

Minor Differences:

Additional minor wording changes have been identified in the generic differences section. These differences do not alter the meaning or intent of the EALs.

Operational Modes and Applicability

Mode applicability for the proposed EALs is consistent with the NEI 99-01, Revision 4 basis scheme and PINGP Technical Specifications. In addition to the Technical Specification operating modes, NEI 99-01, Revision 4, defines the following additional mode:

Defueled

All reactor fuel removed from Reactor Vessel (full core off load during refueling or extended outage)

The modes are provided as part of the Technical Basis Document in Enclosure 4, Attachment 2, and will be used for implementation. Both Prairie Island Unit 1 and Unit 2 utilize the same operational modes.

Implementation Description

Emergency action level classifications will be performed utilizing the ICs and EALs contained in the Emergency Action Level Matrix provided with the proposed Emergency Plan changes in Attachment 4 of Enclosure 4. The matrix information (ICs and EALs) will be implemented in an Emergency Plan Implementing Procedure. The Technical Basis Document will be referred to as a document that may be consulted if additional information is required. Any changes to the approved Emergency Plan ICs and EALs or to the Technical Basis Document will be conducted in accordance with 10 CFR 50.54(q).

ENCLOSURE 3

STATE, TRIBAL AND LOCAL GOVERNMENT AGREEMENT DOCUMENTATION

Offsite Agency Review of New NEI 99-01 EALs

October 7, 2004

WI

Stevens Point, Wisconsin

Attendees:

- Wisconsin Emergency Management
- Wisconsin DHFS – Radiation Protection Section
- Kewaunee County Emergency Management
- Manitowoc County Emergency Management
- Kewaunee Nuclear Power Plant (KNPP)
- Prairie Island Nuclear Generating Plant (PINGP)
- Point Beach Nuclear Plant (PBNP)

Handouts for Kewaunee:

- KNPP
  - EAL Technical Basis Document Draft
  - Differences from current EALs (NUREG-0654) scheme to new EALs (NEI 99-01) scheme
    - EAL Comparison
    - Additional new EALs
  - EAL Agreement Letter

- PINGP
  - EAL Technical Basis Document Draft
  - Differences from current EALs (NUREG-0654) scheme to new EALs (NEI 99-01) scheme
    - EAL Comparison
    - Additional new EALs
  - EAL Agreement Letter

- PBNP
  - EAL Document
  - EAL Agreement Letter

Offsite Agency Review of New NEI 99-01 EALs

October 7, 2004

Stevens Point, Wisconsin

<u>**Agenda:**</u>

1. Overview of the NEI 99-01 EAL scheme
2. KNPP
   - ➢ Introduction of the draft KNPP EAL Technical Basis Document
   - ➢ Review differences from current EALs (NUREG-0654) scheme to new EALs (NEI 99-01) scheme
   - ➢ Present Agreement Letter
   - ➢ Answer specific questions
   - ➢ Discussion of optional meeting to address review questions
2. PINGP
   - ➢ Introduction of the draft PINGP EAL Technical Basis Document
   - ➢ Review differences from current EALs (NUREG-0654) scheme to new EALs (NEI 99-01) scheme
   - ➢ Present Agreement Letter
   - ➢ Answer specific questions
   - ➢ Discussion of optional meeting to address review questions
3. PBNP
   - ➢ Review the draft PBNP EAL Document
   - ➢ Answer specific questions
   - ➢ EAL Agreement Letter

Offsite Agency Review of New NEI 99-01 EALs

October 7, 2004

Stevens Point, Wisconsin

Overview of the NEI 99-01 EAL scheme

In July 2003, the NRC endorsed a NEI 99-01 rev 4 via Reg Guide 1.101. The new scheme was developed by NEI in conjunction with the Nuclear Industry.

Using NEI 99-01, KNPP, PINGP and PBNP is conducting an EAL implementation upgrade project as a NMC Fleet project. While the upgraded EAL's are site specific, an objective of the project was to adapt conformity and consistency between the NMC plants and the industry

a. The NEI 99-01 EAL scheme is divided into five broad groups:

   i. Group **R** – EALs that are **Radiological** in nature

   ii. Group **C** – System Malfunction during **Cold** Shutdown/Refueling modes that effect the safety of the plant

   iii. Group **D** – EAL for Permanently **Defueled** Nuclear Plant - Not applicable for KNPP, PBNP or PINGP

   iv. Group **E** – EALs associated with the Independent Spent Fuel Storage Installation (ISFSI) – Not applicable for KNPP

   v. Group **F** – EALs that are related to loss or challenge of one or more **Fission Product Barriers**

   vi. Group **H** - EALs that are related to external **Hazards** such as security events, fires or natural events

   vii. Group **S** - System Malfunction during normal operations that effect the safety of the plant

b. Each Group is divided into subset based upon Emergency Classification and Initiating Condition:

   i. Emergency Classification remain the same as current:

      Unusual Event (U)

      Alert (A)

      Site Emergency or Site Area Emergency (S)

      General Emergency (G)

   ii. Initiating Conditions (IC) are symptoms or event based conditions that are used as the title for the subsets.

      - Initiating Conditions are operating mode specific.
      - Each Initiating Condition has one or more Emergency Action Level (EAL)
      - A Basis section accompanies each Initiating Condition. The basis section is to assist the end user on determining the correct EAL.

c. Numbering scheme of the EAL's is based upon:
   i. Group letter designation
   ii. Emergency Classification letter designation
   iii. Initiating Condition sequential number
   iv. Period
   v. EAL sequential number

<u>Example:</u> **RA2.1 and RA2.2– Abnormal Radiation, Alert, second Initiating Condition, first and second EAL**

<u>ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT</u>

RA2

Initiating Condition– ALERT

Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.

Operating Mode Applicability: All

Emergency Action Levels: (RA2.1 or RA2.2)

RA2.1. A VALID radiation indication high alarm or reading on one or more of the following radiation monitors:

- R-2 Containment Area
- R-5 Fuel Handling Area
- R-13 or R-14 Aux Bldg Vent Exhaust
- R-11 or R-12 Containment Particulate / Gas Ventilation
- R-21 Containment Vent

RA2.2. Water level

LESS THAN 50% Reactor Refueling Cavity

<u>OR</u>

GREATER THAN 14 feet below top of Spent Fuel Pool that will result in irradiated fuel uncovering.

d. Group F (Fission Product Barrier) EALs are presented in a matrix format. The presentation method was selected by NEI to clearly show the synergy between the EAL's. This supports accurate and timely assessment. The Group F EAL's are arranged by fission product barriers. Classification is based upon various combinations of barrier failure or potential failure.

  i. Fission Product Barriers consist of Fuel Clad, Reactor Coolant System (RCS) and Containment.

  ii. Emergency Classifications for Group F:

    - Unusual Event: ANY loss or ANY Potential Loss of Containment
    - Alert: ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS
    - Site Emergency: Loss or Potential Loss of ANY two Barriers
    - General Emergency: Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

e. Questions

Offsite Agency Review of New NEI 99-01 EALs

October 7, 2004

Stevens Point, Wisconsin

Attendees List:

Wisconsin Emergency Management

[illegible signature]

Wisconsin DHFS – Radiation Protection Section

Dan Stefenel

Kewaunee County Emergency Management

~~Jerrie Coleman, EP MGR~~ 10-07-04

Lori Hucek, Director

Manitowoc County Emergency Management

Nancy H. Crowley, Dir.

Kewaunee Nuclear Power Plant (KNPP)

[illegible signature] EP COORDINATOR

[illegible signature]

Jerrie Coleman

Prairie Island Nuclear Generating Plant (PINGP)

Steven Skoyen - NMC Prairie Island EP Manager

Point Beach Nuclear Plant (PBNP)

Monica Ray - EP Manager

Bill Hennessy - Engineering

Other

Brian McBride - Dominion Resources EP Mgr

STATE OF WISCONSIN

DEPARTMENT OF MILITARY AFFAIRS
Wisconsin Emergency Management

2400 Wright Street
P.O. Box 7865
Madison, WI 53707-7865

October 20, 2004

Steven Skoyen
Emergency Preparedness Manager
Prairie Island Nuclear Plant
1717 Wakonade Drive
Welch, MN 55089

Dear Mr. Skoyen:

Re: Thursday, October 7, 2004 meeting at Stevens Point regarding EAL changes for Prairie Island Nuclear Generating Plant's Emergency Action Levels.

The purpose of the meeting was to discuss the difference between the current NUREG-0654 scheme EALs and proposed conversion to NEI 99-01, Rev. 4 scheme. The differences in classification between the current NUREG-0654 scheme and the proposed NEI 99-01 scheme were described in the Prairie Island EAL Comparison matrix provided and discussed during the review meeting.

The NRC approved the current Prairie Island Nuclear Generating Plant EALs in their 1982 Safety Evaluation Report. The changes discussed on October 7 will incorporate the NEI 99-01 EAL scheme into the Prairie Island Nuclear Generation Plant EALs. The NRC endorsed the NEI 99-01, Rev. 4 scheme via Reg. Guide 1.101, Rev. 4, July 2003.

Bob Host participated in the discussion at the meeting regarding the proposed changes to Prairie Island Nuclear Generating Plant Emergency Action Levels (EALs); they were also reviewed and discussed with Teri Engelhart.

The changes discussed will be included in the Prairie Island Nuclear Generating Plant Emergency Plan upon approval by the Nuclear Regulatory Commission.

10 CRF 50, Appendix E, states "...emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by the NRC."

I have reviewed the changes and concur with Prairie Island's plan to implement these changes later today.

If you have any questions or if I can be of further assistance please contact me.

Sincerely,

William Clare

William Clare
Planning Section Supervisor

Cc: Joe Solymossy, Site Vice President, Prairie Island Nuclear Generating Plant
Gabe Salamon, Regulatory Affairs Manager, Prairie Island Nuclear Generating Plant
Johnnie L. Smith, Administrator, Wisconsin Emergency Management

October 18, 2004

Paul Schmidt, DHFS-Radiation Protection Section
1 West Wilson Street
P.O. Box 2659
Madison, WI 53701-2659

Dear Paul:

PROPOSED CONVERSION OF EMERGENCY ACTION LEVEL SCHEME

Thank you for your Mr. Daniel Stefenel's time to discuss the proposed changes to Prairie Island Nuclear Generating Plant Emergency Action Levels (EALs) at the meeting conducted on Thursday, October 7, 2004, held at Stevens Point.

The purpose of the meeting was to discuss the difference between the current NUREG-0654 scheme EALs and proposed conversion to NEI 99-01, Rev. 4 scheme. The differences in classification between the current NUREG-0654 scheme and the proposed NEI 99-01 scheme were described in the Prairie Island EAL Comparison matrix provided and discussed during the review meeting.

The NRC approved the current Prairie Island Nuclear Generating Plant EALs in their 1982 Safety Evaluation Report. The changes discussed on October 7 will incorporate the NEI 99-01 EAL scheme into the Prairie Island Nuclear Generation Plant EALs. The NRC endorsed the NEI 99-01, Rev. 4 scheme via Reg. Guide 1.101, Rev. 4, July 2003.

10 CFR 50, Appendix E, states "...emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by the NRC."

If you have any questions or comments during your review, please contact Steven Skoyen at (651) 388-1121 x4156. To document your review of and agreement with these changes, please sign below and e-mail or fax this document back to me. My e-mail address is steven.skoyen@nmcco.com and my fax number is (612) 330-6247.

Thank you again for your staff's time. If you have any questions, please call me at (651) 388-1121 x4156.

Sincerely,

Steven Skoyen
Emergency Preparedness Manager
Prairie Island Nuclear Generating Plant

fr/ Cheryl K Rogers — 10-20-04

Paul Schmidt, DHFS-Radiation Protection Section — Date

cc: Joe Solymossy, Site Vice President, Prairie Island Nuclear Generating Plant
Gabe Salamon, Regulatory Affairs Manager, Prairie Island Nuclear Generating Plant

Offsite Agency Review of New 99-01 EALs: – MN, TRIBE, PIERCE Co.

July 27, 2004, Meeting with State of Minnesota, Dan Whitcomb, notification of intent to convert to NEI 99-01 EALs.

August 11, 2004, Distributed Draft Technical Basis to State of Minnesota, Dan Whitcomb.

August 11, 2004, Updated State of Minnesota, during weekly meeting, on progress of EAL project.

August 18, 2004, Updated State of Minnesota, during weekly meeting on progress of EAL project.

August 19, 2004, E-mail to Counties to update on EAL project.

August 27, 2004, Meeting with the State of Minnesota and Counties, REP quarterly meeting, to update and take questions on the EAL conversion project. Minutes and attendees attached.

September 15, 2004, Updated State of Minnesota, during weekly meeting on progress of EAL project.

October 8,2004, E-mailed Monticello's Technical Basis to State and Counties for final review for meeting on October 11.

October 11, 2004, Meeting at State offices to discuss final draft of EAL project with State and Counties. Agenda and attendees attached.

October 12, 2004, E-mailed Prairie Island's Technical Basis to State and Counties for final review.

Meeting Date: October 11, 2004

Attendees:	Agency:
Rob Roy	NMC Mont and PI
Dan Whitcomb	HSEM
Gary Brown	Pierce County
Tim Donakowski	Dept. of Health
Sue McClanahan	Dept. of Health
Onalee Grady-Erickson	HSEM
Debbie Ernst	Wright County
Genell Reese	Wright County
Shannon Rindfleisch	Prairie Island Indian Community
Linda Johnson-Ladd	NMC Mont and PI
Steven Skoyen	NMC PI

Unable to attend, one on one meetings conducted:

Name:	Agency:	Date:
Gary Peterson	Sherburne County	10/13/04
Gary Fried	Goodhue County	10/14/04
David Gish	Dakota County	10/14/04

Handouts:
PING EAL Matrix of differences

Agenda:
Describe EAL change process
Describe new NEI 99-01 EAL format
Discuss changes to existing off-site EAL manuals and timelines
Review EAL differences
Answer specific questions
Describe agreement letter signature process

Attendees: 10/11/04

Offsite Agency Review
NEI 99-01 EALS
for Monticello & Prairie Island

Name	Agency
Rob Roy	NMC
Dan Whitcomb	HSEM
Gary Brown	Pierce County
[illegible]	MN DOH
Sue McCleughen	MDH
[illegible]	HSEM
Debbie [illegible]	Wright Cty
[illegible]	Wright Cty
Shannon Rindfleisch	PIIC
LINDA JOHNSON-Ladd	NMC
Steven Skoyen	NMC
[illegible]	Sherburne Co Em. 10-13-04
Gary A [illegible] 10/14/04	Goodhue County OEM
David M [illegible] 10/14/04	Dakota Co

Nuclear Management Company

NMC
Committed to Nuclear Excellence

* Alliant Energy * Xcel Energy *
* Wisconsin Energy Corporation * Wisconsin Public Service *

October 18, 2004

Shannon Rindfleisch, Emergency Planner
Prairie Island Indian Community
5636 Sturgeon Lake Road
Welch, MN 55089

Dear Shannon:

Thank you for your time to discuss the proposed changes to Prairie Island Nuclear Plant Emergency Action Level (EALs) at the meeting conducted on Monday, October 11, 2004, at the State of Minnesota office of the Department of Homeland Security and Emergency Management.

The purpose of the meeting was to discuss the difference between the current NUREG-0654 scheme EALs and proposed conversion to NEI 99-01, Rev. 4 scheme. **The differences in classification between the current NUREG-0654 scheme and the proposed NEI 99-01 scheme were described in the Prairie Island EAL Comparison matrix provided during the review meeting.**

The NRC approved the current Prairie Island Nuclear Plant EALs in their 1982 Safety Evaluation Report. The changes we discussed will incorporate the NEI 99-01 EAL scheme into the Prairie Island Nuclear Plant EALs. The NRC endorsed the NEI 99-01, Rev. 4 scheme via Reg. Guide 1.101, Rev. 4, July 2003.

10 CFR 50, Appendix E, states "...emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by the NRC."

Thank you for taking time to review the proposed changes. If you have any additional questions or comments, please contact Rob Roy at (763) 295-1670. To document your agreement with these changes, please sign below.

Thank you again for your time.

Sincerely,

Rob Roy
Emergency Preparedness Coordinator,
Monticello and Prairie Island Nuclear Sites

Rindfleisch
Shannon Rindfleisch, Emergency Planner
Prairie Island Indian Community

10/18/04
Date

Nuclear Management Company

NMC
Committed to Nuclear Excellence

• Alliant Energy • Xcel Energy •
• Wisconsin Energy Corporation • Wisconsin Public Service •

October 18, 2004

Dan Whitcomb, Division of Homeland Security and Emergency Management
444 Cedar Street, Suite 223
St. Paul, Minnesota 55101-6223

Dear Dan:

Thank you for your time to discuss the proposed changes to Monticello and Prairie Island Nuclear Plant Emergency Action Levels (EALs) at the meeting conducted on Monday, October 11, 2004, held at HSEM.

The purpose of the meeting was to discuss the difference between the current NUREG-0654 scheme EALs and proposed conversion to NEI 99-01, Rev. 4 scheme.

The NRC approved the current Monticello and Prairie Island Nuclear Plants EALs in their 1982 Safety Evaluation Report. The changes we discussed will incorporate the NEI 99-01 EAL scheme into the Monticello and Prairie Islands Nuclear Plant EALs. The NRC endorsed the NEI 99-01, Rev. 4 scheme via Reg. Guide 1.101, Rev. 4, July 2003.

10 CFR 50, Appendix E, states "...emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by the NRC."

Thank you for taking time to review the proposed changes. If you have any additional questions or comments, please contact Rob Roy at (763) 295-1670. To document your agreement with these changes, please sign below.

Thank you again for your time.

Sincerely,

Rob Roy
Emergency Preparedness Coordinator,
Monticello and Prairie Island Nuclear Sites

Daniel H Whitcomb REP Admin HSEM. — 10-18-2004.
Dan Whitcomb, Division of Homeland Security and Emergency Management — Date

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Company

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• Alliant Energy • Xcel Energy •
• Wisconsin Energy Corporation • Wisconsin Public Service •

October 18, 2004

Gary Brown, Pierce County Emergency Manager
PO Box 805
Ellsworth, Wisconsin 54011

Dear Gary:

Thank you for your time to discuss the proposed changes to Prairie Island Nuclear Plant Emergency Action Level (EALs) at the meeting conducted on Monday, October 11, 2004, held at HSEM.

The purpose of the meeting was to discuss the difference between the current NUREG-0654 scheme EALs and proposed conversion to NEI 99-01, Rev. 4 scheme.

The NRC approved the current Prairie Island Nuclear Plant EALs in their 1982 Safety Evaluation Report. The changes we discussed will incorporate the NEI 99-01 EAL scheme into the Prairie Island Nuclear Plant EALs. The NRC endorsed the NEI 99-01, Rev. 4 scheme via Reg. Guide 1.101, Rev. 4, July 2003.

10 CFR 50, Appendix E, states "...emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by the NRC."

Thank you for taking time to review the proposed changes. If you have any additional questions or comments, please contact Rob Roy at (763) 295-1670. To document your agreement with these changes, please sign below.

Thank you again for your time.

Sincerely,

Rob Roy
Emergency Preparedness Coordinator,
Monticello and Prairie Island Nuclear Sites

Gary Brown

Gary Brown, Pierce County Emergency Manager

10/20/04
Date

Nuclear Management Company

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• Wisconsin Energy Corporation • Wisconsin Public Service •

October 18, 2004

Dave ~~Gish~~ GISCH DMM, Dakota County Emergency Manager
1580 Hwy 55
Hastings, Minnesota 55033

Dear Dave:

Thank you for your time to discuss the proposed changes to Prairie Island Nuclear Plant Emergency Action Level (EALs) at the meeting conducted on Thursday, October 14, 2004, held at your office.

The purpose of the meeting was to discuss the difference between the current NUREG-0654 scheme EALs and proposed conversion to NEI 99-01, Rev. 4 scheme.

The NRC approved the current Prairie Island Nuclear Plant EALs in their 1982 Safety Evaluation Report. The changes we discussed will incorporate the NEI 99-01 EAL scheme into the Prairie Island Nuclear Plant EALs. The NRC endorsed the NEI 99-01, Rev. 4 scheme via Reg. Guide 1.101, Rev. 4, July 2003.

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Sincerely,

Rob Roy
Emergency Preparedness Coordinator,
Monticello and Prairie Island Nuclear Sites

David M Gisch   10/21/04

Dave ~~Gish~~, Dakota County Emergency Manager   Date
GISCH. DMM

Nuclear Management Company

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• Wisconsin Energy Corporation • Wisconsin Public Service •

October 18, 2004

Gary Fried, Goodhue County Emergency Manager
419 Bush Street
Red Wing, Minnesota 55066

Dear Gary:

Thank you for your time to discuss the proposed changes to Prairie Island Nuclear Plant Emergency Action Level (EALs) at the meeting conducted on Thursday, October 14, 2004, held at your office.

The purpose of the meeting was to discuss the difference between the current NUREG-0654 scheme EALs and proposed conversion to NEI 99-01, Rev. 4 scheme.

The NRC approved the current Prairie Island Nuclear Plant EALs in their 1982 Safety Evaluation Report. The changes we discussed will incorporate the NEI 99-01 EAL scheme into the Prairie Island Nuclear Plant EALs. The NRC endorsed the NEI 99-01, Rev. 4 scheme via Reg. Guide 1.101, Rev. 4, July 2003.

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Thank you again for your time.

Sincerely,

Rob Roy
Emergency Preparedness Coordinator,
Monticello and Prairie Island Nuclear Sites

Gary A. Fried

Gary Fried, Goodhue County Emergency Manager

10-20-04
Date

Wisconsin Review
10/07/2004
Minnesota Review
10/11/2004

Prairie Island EAL Comparison
(for scheme change to NEI 99-01 Rev 4)

Current EALs and Proposed Scheme Comparison

Gray areas are differences in classification

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
EAL Ref. Manual ID & (Class.)	Initiating Condition	EAL	EAL ID	EAL	Comments
1B (NUE)	Safety System Functions	Failure of a safety or relief valve in a safety related system to close following reduction of applicable pressure	None		*No longer results in classification. Classification would result in Abnormal Rad Levels/Radiological Effluent EALs if associated with release.*
2A (NUE)	Abnormal Primary Leak Rate	Primary system leak rate from unidentified or uncontrolled sources exceeding Technical Specifications	SU5.1 SU5.2	SU5.1 Unidentified or pressure boundary leakage GREATER THAN 10 gpm. SU5.2 Identified leakage GREATER THAN 25 gpm.	
2B (Alert)	Abnormal Primary Leak Rate	Primary coolant leak rate greater than 50 gpm.	SU5.1 SU5.2 FA1	SU5.1 Unidentified or pressure boundary leakage GREATER THAN 10 gpm. SU5.2 Identified leakage GREATER THAN 25 gpm. Fission Product Barrier Degradation – ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	*Leak rate will determine level of classification.*
2C (SAE)	Abnormal Primary Leak Rate	Loss of Coolant Accident with leak rate in excess of available pump capacity.	FS1	Fission Product Barrier Degradation – Loss or Potential Loss of ANY Two Barriers	
2D (GE)	Abnormal Primary	Small Loss of Coolant Accident and initially	FG1	Fission Product Barrier Degradation – Loss of ANY Two Barriers AND Loss	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
	Leak Rate	successful Emergency Core Cooling System. Subsequent failure of containment heat removal systems over several hours could lead to core melt and likely failure of containment.		or Potential Loss of third Barrier	
2E (GE)	Abnormal Primary Leak Rate	Small and large Loss of Coolant Accident's with failure of Emergency Core Cooling System to perform leading to severe core degradation or melt in from minutes to hours. Ultimate failure of containment likely for melt sequences.	FG1	Fission Product Barrier Degradation – Loss of ANY Two Barriers AND Loss or Potential Loss of third Barrier	
4A (NUE)	Abnormal Primary/Secondary Leak	Primary/Secondary leak rate exceeding Technical Specifications. (>150 gallons per day through 1 steam generator)	None		*Larger leaks would be declare per SU5.1, SU5.2 or the Fission Product Barrier Degradation EALs.*
4B (Alert)	Abnormal Primary/Secondary Leak	Primary/Secondary leak rate greater than 50 gallons per minute.	SU5.1 SU5.2 FA1	<u>SU5.1</u> Unidentified or pressure boundary leakage GREATER THAN 10 gpm. <u>SU5.2</u> Identified leakage GREATER THAN 25 gpm. <u>Fission Product Barrier Fission</u> Product Barrier Degradation – ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	*Leak rate will determine level of classification.*
4C (Alert)	Abnormal Primary/Secondary Leak	Failure of steam generator tube(s) resulting in Emergency Core Cooling System actuation.	FA1	Fission Product Barrier Degradation – ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	

Prairie Island EAL Comparison
(for scheme change to NEI 99-01 Rev 4)

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
4D (SAE)	Abnormal Primary/Secondary Leak	Failure of steam generator tube(s) resulting in Emergency Core Cooling System actuation <u>and</u> high potential for loss of containment.	FS1	Fission Product Barrier Degradation – Loss or Potential Loss of ANY Two Barriers	
4E (SAE)	Abnormal Primary/Secondary Leak	Failure of steam generator tube(s) resulting in Emergency Core Cooling System actuation <u>and</u> loss of offsite power.	FA1	Fission Product Barrier Degradation – ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	
5A (NUE)	Core Fuel Damage	Fuel Damage Indication	SU4.1 SU4.2	<u>SU4.1</u> Radiation Monitor 1(2)R-9 GREATER THAN 1 R/hr indicating fuel clad degradation <u>SU4.2</u> Coolant sample activity GREATER THAN Technical Specification 3.4.17 allowable limits indicating fuel clad degradation	
5B (Alert)	Core Fuel Damage	Severe loss of fuel cladding.	FA1	Fission Product Barrier Degradation – ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	
5C (SAE)	Core Fuel Damage	Degraded core with possible loss of coolable geometry.	FS1	Fission Product Barrier Degradation – Loss or Potential Loss of ANY Two Barriers	
6 Case 1 (GE)	Loss of 2 of 3 Fission Product Barriers	<u>CASE 1</u>: Loss of clad, loss of primary coolant boundary (Loss of Coolant Accident), and high potential for loss of containment.	FG1	Fission Product Barrier Degradation – Loss of ANY Two Barriers AND Loss or Potential Loss of third Barrier	
6 Case 2 (GE)	Loss of 2 of 3 Fission Product Barriers	<u>CASE 2</u>: Loss of clad, SG tube rupture and high potential for loss of containment.	FG1	Fission Product Barrier Degradation – Loss of ANY Two Barriers AND Loss or Potential Loss of third Barrier	
6 Case 3	Loss of 2 of 3	<u>CASE 3</u>: Loss of clad,	FG1	Fission Product Barrier Degradation –	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
(GE)	Fission Product Barriers	containment failure, and a high potential for loss of the Reactor Coolant System boundary.		Loss of ANY Two Barriers AND Loss or Potential Loss of third Barrier	
6 Case 4 (GE)	Loss of 2 of 3 Fission Product Barriers	CASE 4: Loss of Reactor Coolant System boundary (Loss of Coolant Accident), loss of containment, and high potential for loss of cladding.	FG1	Fission Product Barrier Degradation – Loss of ANY Two Barriers AND Loss or Potential Loss of third Barrier	
6 Case 5 (GE)	Loss of 2 of 3 Fission Product Barriers	CASE 5: Loss of Reactor Coolant System boundary (Steam Generator Tube Rupture), loss of containment, and high potential for loss of cladding.	FG1	Fission Product Barrier Degradation – Loss of ANY Two Barriers AND Loss or Potential Loss of third Barrier	
7A (NUE)	Secondary Coolant Anomaly	Rapid depressurization of Secondary Side.	None		*No longer results in classification.*
7B (Alert)	Secondary Coolant Anomaly	Steam line break inside containment with significant (greater than 150 gpd) primary to secondary leak rate.	FA1	Fission Product Barrier Degradation – ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	
7C (SAE)	Secondary Coolant Anomaly	Unisolable steam line break outside containment with significant (greater than 150 gpd) primary to secondary leak rate.	FS1	Fission Product Barrier Degradation – Loss or Potential Loss of ANY Two Barriers	
7D (SAE)	Secondary Coolant Anomaly	Steam line break in containment with greater than 50 gpm primary to secondary leakage and indication of fuel damage.	FS1	Fission Product Barrier Degradation – Loss or Potential Loss of ANY Two Barriers	
7E (GE)	Secondary Coolant Anomaly	Transient initiated by loss of feedwater and condensate	SS4.1	SS4.1 Loss of core cooling and heat sink, as indicated by conditions that	*Escalation to a GE would be via Abnormal Rad*

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
		systems (principal heat removal system) followed by failure of emergency feedwater system for extended period. Core melting possible in several hours. Ultimate failure of containment likely if core melts.	FS1	require entry into: a. Core Cooling - RED path **AND** b. Heat Sink - RED path <u>Fission Product Barrier Degradation</u> – Loss or Potential Loss of ANY Two Barriers.	*Levels/Radiological Effluent or Fission Product Barrier Degradation EALs.*
8A (NUE)	Radiological Effluents	Airborne Radiological effluent Technical Specifications exceeded.	RU1.1 RU1.2	<u>RU1.1</u> VALID reading on any effluent monitor that exceeds two times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer. <u>RU1.2</u> VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 60 minutes or longer:	
8B (NUE)	Radiological Effluents	Liquid Radiological effluent Technical Specification limits exceeded.	RU1.1 RU1.2	<u>RU1.1</u> VALID reading on any effluent monitor that exceeds two times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer. <u>RU1.2</u> VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 60 minutes or longer:	
8C (Alert)	Radiological Effluents	Liquid Radiological effluent greater than ten times Technical Specification limits.	RA1.1 RA1.2	<u>RA1.1</u> VALID reading on any effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer. <u>RA1.2</u> VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				shown for 15 minutes or longer:	
8D (Alert)	Radiological Effluents	Airborne Radiological effluents greater than ten times Technical Specification instantaneous limits (an instantaneous rate which, if continued for over two hours, would result in about 1 mrem TEDE at the site boundary under average met conditions). TEDE = Total Effective Dose Equivalent	RA1.1 RA1.2	RA1.1 VALID reading on any effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer. RA1.2 VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 15 minutes or longer:	
8E (SAE)	Radiological Effluents	Airborne Effluent monitors detect levels > 50mrem/hr TEDE for ½ hour, or 250 mrem/hr Thyroid CDE for ½ hour, or 500 mrem/hr TEDE for two minutes, or 2500 mrem/hr Thyroid CDE for two minutes at the site boundary for adverse meteorology.	RS1.1 RS1.2 RS1.3	RS1.1 VALID reading on one or more monitors listed in Table R-1 that exceeds or is expected to exceed column "SAE" for 15 minutes or longer: RS1.2 Dose assessment using actual meteorology indicates doses GREATER THAN 100 mRem TEDE or 500 mRem thyroid CDE at or beyond the site boundary. RS1.3 Field survey results indicate closed window dose rates exceeding 100 mR/hr expected to continue for more than one hour, at or beyond the site boundary; **OR** Analyses of field survey samples indicate thyroid CDE of 500 mRem for one hour of inhalation, at or beyond the site boundary.	/
8F (GE)	Radiological Effluents	Effluent monitors detect levels corresponding to 1 rem/hr TEDE, or 5 rem/hr	RG1.1 RG1.2 RG1.3	RG1.1 VALID reading on one or more monitors listed in Table R-1 that exceeds or expected to exceed	

Prairie Island EAL Comparison
(for scheme change to NEI 99-01 Rev 4)

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
		Thyroid CDE at the site boundary under actual meteorological conditions. TEDE = Total Effective Dose Equivalent. Thyroid CDE = Thyroid Committed Dose Equivalent.		column "GE" for 15 minutes or longer: <u>RG1.2</u> Dose assessment using actual meteorology indicates doses GREATER THAN 1000 mRem TEDE or 5000 mRem thyroid CDE at or beyond the site boundary. <u>RG1.3</u> Field survey results indicate closed window dose rates exceeding 1000 mR/hr expected to continue for more than one hour, at or beyond site boundary. **OR** Analyses of field survey samples indicate thyroid CDE of 5000 mRem for one hour of inhalation, at or beyond site boundary.	
8G (Alert)	Radiological Effluents	Radiation levels or airborne contamination which indicate a severe degradation in the control of radioactive materials (e.g., increase of factor of 1000 in direct radiation readings within facility).	RU2.2	Any UNPLANNED VALID Area Radiation Monitor reading increases by a factor of 1000 over normal* levels.	*Escalation to Alert per Abnormal Rad Levels/Radiological Effluent EALs in section RA3.*
9A (NUE)	Major Electrical Failures	Loss of Offsite Power.	SU1.1	Loss of all offsite power to both Buses 15(25) and 16(26) for GREATER THAN 15 minutes. **AND** At least two emergency generators are supplying power to emergency busses.	
9B (NUE)	Major Electrical Failures	Loss of onsite AC Power Capability.	None		*New EAL is for loss of offsite power per*
9C (Alert)	Major Electrical Failures	Loss of offsite power <u>and</u> loss of all onsite AC power.	SA5.1	AC power capability to Safeguards Buses 15(25) and 16(26) reduced to	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				to only one of the following sources for GREATER THAN 15 minutes • CT-11 • CT-12 • 1RY • 2RY • D1, D2, D5, or D6 **AND** Any additional single failure will result in station blackout.	
9D (SAE)	Major Electrical Failures	Loss of offsite power and loss of onsite AC power for more than 15 minutes.	SS1.1	Loss of all offsite power to Safeguards Buses 15(25) and 16(26) **AND** Failure of all EDGs to supply power to emergency busses 15(25) or 16(26). **AND** Failure to restore power to at least one emergency bus within 15 minutes from the time of loss of both offsite and onsite AC power.	
9E (GE)	Major Electrical Failures	Failure of offsite and onsite power along with total loss of emergency feedwater makeup capability for greater than 2 hours. This would lead to eventual core melt and likely failure of containment.	SG1.1	Loss of all offsite power to Safeguards Buses 15(25) and 16(26) **AND** Failure of all EDGs to supply power to Safeguards Buses **AND** Either of the following: (a or b) a. Restoration of at least one Safeguards Bus within 4 hours is not likely **OR** b. Continuing degradation of core cooling based on Fission Product Barrier monitoring as indicated by	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				conditions that require entry into Core Cooling-RED or ORANGE path	
9F (Alert)	Major Electrical Failures	Loss of all onsite DC power.	None		*Escalation to SS3.1 if loss is for greater than 15 minutes.*
9G (SAE)	Major Electrical Failures	Loss of all vital onsite DC power for more than 15 minutes.	SS3.1	Loss of all Safeguards DC power based on LESS THAN 105 VDC on 125VDC Panel 11(21) and Panel 12(22) for GREATER THAN 15 minutes.	
10A (Alert)	Control Room Evacuations	Evacuation of the Control Room anticipated or required with control of shutdown systems established from Hot Shutdown Panels and local stations.	HA5.1	HA5.1. Entry into 1(2)C1.3 AOP-1 Shutdown from Outside the Control Room or F-5 Appendix B Control Room Evacuation (Fire) for control room evacuation.	
10B (SAE)	Control Room Evacuations	Evacuation of the Control Room and control of shutdown systems not established from Hot Shutdown Panels and local stations within 15 minutes.	HS2.1	HS2.1. Control room evacuation has been initiated. **AND** Control of the plant cannot be established per 1(2)C1.3 AOP-1, Shutdown from Outside the Control Room or F-5 Appendix B, Control Room Evacuation (Fire) within 15 minutes.	
11A (NUE)	**Fires**	Fire within the plant or Spent Fuel Storage Facility area lasting more than 10 minutes.	HU2.1	HU2.1. FIRE in buildings or areas contiguous (in actual contact with or immediately adjacent) to any Table H-1 areas not extinguished within 15 minutes of control room notification or verification of a control room alarm	
11B (Alert)	**Fires**	Fire potentially affecting safety systems.	HA2.1	HA2.1. FIRE or EXPLOSION in any of the following areas (Table H-1): **AND** Affected system parameter	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area.	
11C (SAE)	**Fires**	Fire compromising the functions of safety systems.	HA2.1	HA2.1 FIRE or EXPLOSION in any of the following areas (Table H-1): **AND** Affected system parameter indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area.	*Degradation in performance of affected systems would be addressed by System Malfunction EALs.*
12B (NUE)	Plant Shutdown Functions	Nonfunction indications or alarms in the Control Room.	SU3.1	UNPLANNED loss of most or all annunciators or indicators associated with safety systems for GREATER THAN 15 minutes. • Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2) NIS Racks I, II, III, IV	
12C (Alert)	Plant Shutdown Functions	Most or all alarms (annunciators) lost.	SU3.1 SA4.1	SU3.1 UNPLANNED loss of most or all annunciators or indicators associated with safety systems for GREATER THAN 15 minutes. • Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2) NIS Racks I, II, III, IV SA4.1 UNPLANNED loss of most or all system annunciators or indicators associated with safety systems for GREATER THAN 15 minutes • Main Control Boards A, B-	*Escalation to an Alert if a transient is in progress or compensatory indications are unavailable.*

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV **AND** Either of the following: (a or b) a. A SIGNIFICANT TRANSIENT is in progress. **OR** b. Compensatory non-alarming indications are unavailable.	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
12D (SAE)	Plant Shutdown Functions	Most or all alarms (annunciators) lost and plant transient initiated or in progress.	SA4.1 SS6.1	SA4.1 UNPLANNED loss of most or all system annunciators or indicators associated with safety systems for GREATER THAN 15 minutes • Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV **AND** Either of the following: (a or b) a. A SIGNIFICANT TRANSIENT is in progress. **OR** b. Compensatory non-alarming indications are unavailable. SS6.1 Loss of most (2 out of 3) or all NSSS, BOP, and ERCS system annunciators associated with safety systems **AND** A SIGNIFICANT TRANSIENT in progress. **AND** Compensatory non-alarming indications are unavailable. **AND** Indications needed to monitor the ability to shut down the reactor, maintain the core cooled, maintain the reactor coolant system intact, and maintain containment intact are unavailable.	*Escalation to a Site Emergency if indications for reactor shutdown, core cooling, RCS integrity and containment integrity are unavailable.*
12E (NUE)	Plant Shutdown Functions	Momentary loss of core cooling needed for plant Mode 5, Cold Shutdown.	None		*Would result in UE per CU4.1 if RCS temp exceeded 200 degrees F.*
12F	Plant Shutdown	Inability to maintain plant in	CA4.1	With CONTAINMENT CLOSURE and	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
(Alert)	Functions	Mode 5, Cold Shutdown.		RCS integrity not established an UNPLANNED event results in RCS temperature exceeding 200 degrees F.	
12G (SAE)	Plant Shutdown Functions	Loss of water level that has uncovered or will uncover the fuel in the reactor vessel while at Mode 5, Cold Shutdown.	CS1.1 CS1.2 CG1.1	CS1.1 With CONTAINMENT CLOSURE not established: a. RPV inventory as indicated by RPV level LESS THAN 68% RVLIS Full Range **OR** b. RPV level cannot be monitored for GREATER THAN 30 minutes with a loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms CS1.2 With CONTAINMENT CLOSURE established: a. RPV inventory as indicated by RPV level LESS THAN 63% RVLIS Full Range **OR** b. RPV level cannot be monitored for GREATER THAN 30 minutes with a loss of RPV inventory as indicated by either: • Unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms • Erratic Source Range Monitor Indication CG1.1 Loss of RPV inventory as	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms AND RPV Level: a. LESS THAN 63% RVLIS Full Range for GREATER THAN 30 minutes **OR** b.cannot be monitored, with indication of core uncovery for GREATER THAN 30 minutes as evidenced by one or more of the following: Containment High Range Radiation Monitor (R48 or R49) reading > 5 R/hr Erratic Source Range Monitor Indication **AND** Indication of CONTAINMENT challenged as indicated by one or more of the following: • Containment hydrogen concentration GREATER THAN OR EQUAL TO 6% • Containment pressure above 46 psig CONTAINMENT CLOSURE not established	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
12H (SAE)	Plant Shutdown Functions	Complete loss of any function needed for plant Mode 3, Hot Standby.	SS4.1	Loss of core cooling and heat sink as indicated by conditions that require entry into: a. Core Cooling - RED path **AND** b. Heat Sink - RED path	
12I (NUE)	Plant Shutdown Functions	Turbine Failure requiring a reactor/turbine trip.	None		*Turbine failure resulting in damage (casing penetration) would be classified per HU1.5*
12J (Alert)	Plant Shutdown Functions	Turbine Failure causing casing penetration.	HU1.5 HA1.4	<u>HU1.5</u> Report of turbine failure resulting in casing penetration or damage to turbine or generator seals. <u>HA1.4</u> Turbine failure-generated missiles result in any VISIBLE DAMAGE to or penetration of any of the following plant areas (Table H-1).	*Escalation of classification is based on potential damage done by missiles generated by the failure.*

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
12K (Alert)	Plant Shutdown Functions	Failure of the reactor protection system to initiate and complete a trip which brings the reactor subcritical.	SA2.1 SS2.1	SA2.1 Indication(s) exist that a Reactor Protection System setpoint was exceeded **AND** RPS automatic trip did not reduce power to less than 5% **AND** Any of the following operator actions are successful in reducing power to LESS THAN 5%: Manual Control Board: • Reactor Trip • AMSAC/DSS Actuation • Turbine Trip SS2.1 Indication(s) exist that automatic and manual trip were NOT successful in reducing power to LESS THAN 5%.	*Escalation if both automatic and manual trips were not successful.*
12L (SAE)	Plant Shutdown Functions	Transient requiring operation of shutdown systems with failure to trip (continued power generation but no core damage immediately evident).	SS2.1	Indication(s) exist that automatic and manual trip were NOT successful in reducing power to LESS THAN 5%.	
12M (GE)	Plant Shutdown Functions	Transient requiring operation of shutdown systems with failure to trip which results in core damage or additional failure of core cooling and makeup systems (which could lead to core melt).	SG2.1	Indication(s) exist that automatic and manual trip were NOT successful in reducing power to LESS THAN 5%. **AND** Either of the following: (a or b) a. Core cooling is extremely challenged as indicated by conditions that require entry into Core Cooling - RED path. **OR** b. Heat removal is extremely	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				challenged as indicated by conditions that require entry into Heat Sink - RED path.	
13A (Alert)	Fuel Handling Accidents	Fuel damage accident with release of radioactivity to containment.	RA2.1	A VALID alarm or reading on one or more of the following radiation monitors: • R-25 or R-31 SFP Air Monitor • R-5 Fuel Handling Area Monitor reading (10 mR/hr) • R-28 New Fuel Pool Criticality Area Monitor (10 mR/hr) • 1(2) R-11 Ctmt/SBV Air Particulate Monitor • 1(2) R-12 Ctmt/SBV Radio Gas Monitor • 1(2) R-2 Containment Vessel Area Monitor (50 mR/hr)	
13B (Alert)	Fuel Handling Accidents	Fuel damage accident with release of radioactivity to the fuel handling building.	RA2.1	A VALID alarm or reading on one or more of the following radiation monitors: • R-25 or R-31 SFP Air Monitor • R-5 Fuel Handling Area Monitor reading (10 mR/hr) • R-28 New Fuel Pool Criticality Area Monitor (10 mR/hr) • 1(2) R-11 Ctmt/SBV Air Particulate Monitor • 1(2) R-12 Ctmt/SBV Radio Gas Monitor 1(2) R-2 Containment Vessel Area Monitor (50 mR/hr)	
13C	Fuel Handling Accidents	Major damage to spent fuel in containment or fuel	RA2.1	RA2.1 A VALID alarm or reading on one or more of the following radiation	*Classification would be dependent upon the level of*

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
(SAE)		handling building (e.g., large object damages fuel or water loss below fuel level).	RS1.1 RG1.1 CG1.1	monitors: • R-25 or R-31 SFP Air Monitor • R-5 Fuel Handling Area Monitor reading (10 mR/hr) • R-28 New Fuel Pool Criticality Area Monitor (10 mR/hr) • 1(2) R-11 Ctmt/SBV Air Particulate Monitor • 1(2) R-12 Ctmt/SBV Radio Gas Monitor • 1(2) R-2 Containment Vessel Area Monitor (50 mR/hr) <u>RS1.1</u> VALID reading on one or more monitors listed in Table R-1 that exceeds or is expected to exceed column "SAE" for 15 minutes or longer. <u>RG1.1</u> VALID reading on one or more monitors listed in Table R-1 that exceeds or expected to exceed column "GE" for 15 minutes or longer. <u>CG1.1</u> Loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms **<u>AND</u>** RPV Level: a. LESS THAN 63% RVLIS Full Range for GREATER THAN 30 minutes **OR** b. cannot be monitored, with indication	*the rad monitors and could escalate to GE based upon water loss below fuel level.*

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				of core uncovery for GREATER THAN 30 minutes as evidenced by one or more of the following: Containment High Range Radiation Monitor (R48 or R49) reading > 5 R/hr Erratic Source Range Monitor Indication **AND** Indication of CONTAINMENT challenged as indicated by one or more of the following: • Containment hydrogen concentration GREATER THAN OR EQUAL TO 6% • Containment pressure above 46 psig • CONTAINMENT CLOSURE <u>not</u> established	
16A (NUE)	**Security**	Credible site-specific security threat notification or attempted entry or attempted sabotage.	HU4.1 HU4.2 EU2.1	<u>HU4.1</u> Security Contingency Event as determined from PINGP Security Plan and reported by the PINGP security shift supervision <u>HU4.2</u> A credible security threat notification. <u>EU2.1</u> Security Contingency Event as determined from PINGP Security Plan and reported by the PINGP security shift supervision.	
16B (Alert)	**Security**	Ongoing security compromise.	HA4.1 HA4.2	<u>HA4.1</u> INTRUSION into the plant PROTECTED AREA by a HOSTILE FORCE. <u>HA4.2</u> Security Contingency Event in a plant PROTECTED AREA as determined from PINGP Security Plan	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				and reported by the PINGP security shift supervision	
16C (SAE)	**Security**	Imminent loss of physical control of the plant.	HS1.1 HS1.2	HS1.1 INTRUSION into the plant VITAL AREA by a HOSTILE FORCE. HS1.2 Security shift supervision reports ANY of the following: ▪ A security event that results in the loss of control of ANY VITAL AREAS (other than Control Room) ▪ Imminent loss of physical control of the facility (remote shutdown capability) due to a security event ▪ A confirmed sabotage discovered in a VITAL AREA	
16D (GE)	**Security**	Loss of physical control of the plant.	HG1.1	A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions as indicated by loss of physical control of EITHER: A VITAL AREA such that operation of equipment required for safe shutdown is lost **OR** Spent fuel pool cooling systems if imminent fuel damage is likely (e.g. freshly off-loaded reactor core in the pool).	
17A (NUE)	Hazards to Plant Operations	Aircraft crash onsite or unusual aircraft activity over facility.	HU1.3	Vehicle crash into plant structures or systems within PROTECTED AREA boundary.	

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(for scheme change to NEI 99-01 Rev 4)

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
17B (Alert)	Hazards to Plant Operations	Aircraft crash in the protected area.	HU1.3 HA1.3	HU1.3 Vehicle crash into plant structures or systems within PROTECTED AREA boundary. HA1.3 Vehicle crash within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures or equipment therein Control Room indication of degraded performance of those systems (Table H-1)	*Escalation based upon visible damage or indication of degraded performance.*
17C (SAE)	Hazards to Plant Operations	Aircraft crash within protected area and affecting vital structures by impact or fires with plant not in Mode 5, Cold Shutdown.	HA1.3	Vehicle crash within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures or equipment therein Control Room indication of degraded performance of those systems (Table H-1)	*Escalation to Site Emergency would be based on System Malfunction EALs.*
17D (NUE)	Hazards to Plant Operations	Near or onsite explosion.	HU1.4	Report by plant personnel of an unanticipated EXPLOSION within PROTECTED AREA boundary resulting in VISIBLE DAMAGE to permanent structure or equipment.	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
17E (Alert)	Hazards to Plant Operations	Known explosion damage to facility affecting plant operation.	HU1.4 HA2.1	HU1.4 Report by plant personnel of an unanticipated EXPLOSION within PROTECTED AREA boundary resulting in VISIBLE DAMAGE to permanent structure or equipment. HA2.1 FIRE or EXPLOSION in any of the following areas (Table H-1): **AND** Affected system parameter indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area.	*Escalation from UE to Alert would be based on damage to Vital Areas.*
17F (Alert)	Hazards to Plant Operations	Missile impacts from whatever source on facility.	HA1.4 HA2.1	HA1.4 Turbine failure-generated missiles result in any VISIBLE DAMAGE to or penetration of any of the following plant areas (Table H-1). HA2.1 FIRE or EXPLOSION in any of the following areas (Table H-1): **AND** Affected system parameter indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area.	
17G (SAE)	Hazards to Plant Operations	Severe damage to safe shutdown equipment from missiles or explosion with plant not in Mode 5, Cold Shutdown.	HA1.4 HA2.1	HA1.4 Turbine failure-generated missiles result in any VISIBLE DAMAGE to or penetration of any of the following plant areas (Table H-1). HA2.1 FIRE or EXPLOSION in any of the following areas (Table H-1): **AND** Affected system parameter	*Escalation to higher classifications would be based upon System Malfunction, Fission Product Barrier Degradation, or Abnormal Rad Levels/Radiological Effluent EALs.*

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area.	
17H (NUE)	Hazards to Plant Operations	Near or onsite toxic or flammable gas release.	HU3.1 HU3.2	HU3.1 Report or detection of toxic or flammable gases that has or could enter the site area boundary in amounts that can affect NORMAL PLANT OPERATIONS. HU3.2 Report by Local, County or State Officials for evacuation or sheltering of site personnel based on an offsite event.	
17I (Alert)	Hazards to Plant Operations	Entry into the plant environs of toxic or flammable gases.	HA3.1 HA3.2	HA3.1 Report or detection of toxic gases within or contiguous to Table H-1 areas in concentrations that may result in an atmosphere IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH). HA3.2 Report or detection of gases in concentration GREATER THAN the LOWER FLAMMABILITY LIMIT within or contiguous to Table H-1 areas.	
17J (SAE)	Hazards to Plant Operations	Entry of toxic or flammable gases into vital areas with plant not in Mode 5, Cold Shutdown.	HA3.1 HA3.2	HA3.1 Report or detection of toxic gases within or contiguous to Table H-1 areas in concentrations that may result in an atmosphere IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH). HA3.2 Report or detection of gases in concentration GREATER THAN the LOWER FLAMMABILITY LIMIT within or contiguous to Table H-1 areas.	
18A	ISFSI Events	Spent Fuel Storage Facility cask tip over or drop resulting	EU1.2	EU1.2 Accident conditions affecting a	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
(NUE)		in cask seal leakage.	EU1.3	loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask. • dropped cask • cask burial • explosion • fire EU1.3 Any condition in the opinion of the Emergency Director that indicates loss of loaded fuel storage cask CONFINEMENT BOUNDARY	
18B (Alert)	ISFSI Events	Loss of Spent Fuel Storage Facility cask/fuel containment barrier.	EU1.1 EU1.2 EU1.3	EU1.1 Natural phenomena events affecting a loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask. • earthquake • tornado (and tornado missile) • flood • lightning • snow/ice EU1.2 Accident conditions affecting a loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask. • dropped cask • cask burial • explosion • fire EU1.3 Any condition in the opinion of the Emergency Director that indicates loss of loaded fuel storage cask CONFINEMENT BOUNDARY	*Escalation would be per Emergency Director Judgment.*
19A	Natural Events	Any earthquake.	HU1.1	Earthquake felt in plant as indicated by VALID "Event Alarm" on Seismic	

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
(NUE)				Monitoring Panel.	
19B (Alert)	Natural Events	Earthquake greater than Operational Basis Earthquake.	HA1.1	Seismic Event GREATER THAN Operating Basis Earthquake (OBE) as indicated by VALID "OBE" alarm on Seismic Monitoring Panel.	
19C (SAE)	Natural Events	Earthquake greater than Design Basis Earthquake with plant not in Mode 5, Cold Shutdown.	HA1.1	Seismic Event GREATER THAN Operating Basis Earthquake (OBE) as indicated by VALID "OBE" alarm on Seismic Monitoring Panel.	*Escalation to higher classifications would be based upon System Malfunction, Fission Product Barrier Degradation, or Abnormal Rad Levels/Radiological Effluent EALs.*
19D (NUE)	Natural Events	Any tornado visible from site.	HU1.2	Report by plant personnel of tornado or high winds GREATER THAN 95 mph striking within PROTECTED AREA boundary.	
19E (Alert)	Natural Events	Any tornado striking the facility	HA1.2	Tornado or high winds GREATER THAN 95 mph within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures / equipment or Control Room indication of degraded performance of those systems. (Table H-1)	
19F (NUE)	Natural Events	50 year flood.	None		*Bounded by HU1.7.*
19G (Alert)	Natural Events	Flood levels approaching design levels.	HU1.7	HU1.7 High or low river water level occurrences affecting the PROTECTED AREA as indicated by: River intake level GREATER THAN 692 ft MSL **OR**	*Escalation to HA1.6 as design levels are approached.*

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(for scheme change to NEI 99-01 Rev 4)

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
				River intake level LESS THAN 669.5 ft MSL.	
19H (SAE)	Natural Events	Flood levels exceeding design levels with plant not in Mode 5, Cold Shutdown.	HA1.6	HA1.6: High or low river water level occurrences affecting the PROTECTED AREA as indicated by: River intake level GREATER THAN 698 ft MSL **OR** River intake level LESS THAN 666.5 ft MSL.	*Escalation per System Malfunction EALs*
19I (NUE)	Natural Events	Low water levels being experienced or projected beyond usual levels.	None		*No longer a classification. Bounded by HU1.7*
19J (Alert)	Natural Events	Low water levels being experienced or projected to be near design levels.	HU1.7	HU1.7: High or low river water level occurrences affecting the PROTECTED AREA as indicated by: River intake level GREATER THAN 692 ft MSL **OR** River intake level LESS THAN 669.5 ft MSL.	*Escalation per HA1.6*
19K (SAE)	Natural Events	With plant <u>not</u> in Mode 5, Cold Shutdown, low water levels being experienced or projected to be less than design levels or failure of vital equipment with low water level.	HA1.6	HA1.6: High or low river water level occurrences affecting the PROTECTED AREA as indicated by: River intake level GREATER THAN 698 ft MSL **OR** River intake level LESS THAN 666.5 ft MSL	*Escalation would be through System Malfunctions EALs*
19L	Natural Events	Sustained winds being experienced or projected	HU1.2	Report by plant personnel of tornado	*Escalation per HA1.2 if*

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(for scheme change to NEI 99-01 Rev 4)

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
(Alert)		near design levels.		or high winds GREATER THAN 95 mph striking within PROTECTED AREA boundary.	*there is visible damage or indication of degraded system performance.*
19M (SAE)	Natural Events	Sustained winds being in excess of design levels being experienced or projected with plant <u>not</u> in Mode 5, Cold Shutdown.	HU1.2	Report by plant personnel of tornado or high winds GREATER THAN 95 mph striking within PROTECTED AREA boundary.	*Escalation per HA1.2 if there is visible damage or indication of degraded system performance.*
19N (GE)	Natural Events	Any major internal or external events (e.g., fires, earthquake, substantially beyond design levels) which could or has caused massive damage to plant systems resulting or potential for resulting in large releases to the offsite environment in excess of the EPA Protective Action Guides	HG2.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	
20A (NUE)	Other	Conditions that warrant increased awareness on the part of plant operations staff or state and/or local offsite authorities.	HU5.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or 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.	
20B (NUE)	Other	Inability to reach required shutdown within Technical Specification Limits.	SU2.1	Plant is not brought to required operating mode within Technical Specifications LCO Action Statement Time.	
20C (NUE)	Other	Conditions that involve other than normal controlled shutdown.	None		*No longer a classification.*

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(for scheme change to NEI 99-01 Rev 4)

Current EALs (NUREG-0654)			Proposed EALs (NEI 99-01, Rev. 04)		
20D (Alert)	Other	Conditions that warrant activation of Technical Support Center and nearsite Emergency Operating Facility.	HA6.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely 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.	
20E (SAE)	Other	Other plant conditions that warrant activation of emergency operating centers and monitoring teams or a precautionary notification to the public near the site.	HS3.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.	
20F (GE)	Other	Other plant conditions exist, from whatever source, that make release of large amounts of radioactivity in a short time period possible, e.g., any core melt situation.	HG2.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	

New EALs Under the Proposed Scheme (NEI 99-01, Rev. 04)

EAL ID	EAL
CU1.1	Unidentified or pressure boundary leakage GREATER THAN 10 gpm.
CU1.2	Identified leakage GREATER THAN 25 gpm.
CU2.1	UNPLANNED RCS level decrease below the RPV Reactor Vessel flange for GREATER THAN OR EQUAL TO 15 minutes
CU2.2	Loss of RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms **AND** RPV level cannot be monitored
CU3.1	CU3.1. Loss of all offsite power to Buses 15(25) and 16(26) for GREATER THAN 15 minutes. **AND** At least one emergency generator is supplying power to an emergency bus.
CU4.1	An UNPLANNED event results in RCS temperature exceeding 200°F
CU4.2	Loss of all RCS temperature and RPV level indication for GREATER THAN 15 minutes.
CU5.1	RCS Letdown Rad Monitor (1(2)R-9 or portable radiation monitoring instrumentation) GREATER THAN 1 R/hr indicating fuel clad degradation
CU5.2	Coolant sample activity GREATER THAN Technical Specification 3.4.17 allowable limits indicating fuel clad degradation
CU6.1	Loss of all Table C-1 onsite communications capability affecting the ability to perform routine operations.
CU6.2	Loss of all Table C-2 offsite communications capability.
CU7.1	UNPLANNED Loss of all vital DC power based on LESS THAN 105 VDC on 125 VDC Panels 11(21) and 12(22) **AND** Failure to restore power to at least one required DC panel within 15 minutes from the time of loss.
CU8.1	An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.
CA1.1	Loss of RCS inventory as indicated by RPV level LESS THAN 0 inches Refueling Canal/RCS Narrow Range (72% RVLIS Full Range)
CA1.2	Loss of RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms **AND** RCS level cannot be monitored for GREATER THAN 15 minutes
CA2.1	Loss of RPV inventory as indicated by RPV level LESS THAN 0 inches Refueling Canal/RCS Narrow Range (72% RVLIS Full Range).
CA2.2	Loss of RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms

EAL ID	EAL
	AND RPV level cannot be monitored for GREATER THAN 15 minutes
CA3.1	CA3.1. Loss of all offsite power to Buses 15(25) and 16(26) **AND** Failure of all emergency generators to supply power to emergency busses. **AND** Failure to restore power to at least one emergency bus within 15 minutes from the time of loss of both offsite and onsite AC power.
CA4.2	With CONTAINMENT CLOSURE established and RCS integrity not established or RCS inventory reduced an UNPLANNED event results in RCS temperature exceeding 200 degrees F for GREATER THAN 20 minutes[1].
CA4.3	An UNPLANNED event results in RCS temperature exceeding 200 degrees F for GREATER THAN 60 minutes[1] or results in an RCS pressure rise of GREATER THAN ·25psig.
CS2.1	With CONTAINMENT CLOSURE not established: a. RPV inventory as indicated by RPV level LESS THAN 68% RVLIS Full Range **OR** b. RPV level cannot be monitored with Indication of core uncovery as evidenced by one or more of the following: ▪ Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN 5 R/hr ▪ Erratic Source Range Monitor Indication
CS2.2	With CONTAINMENT CLOSURE established a. RPV inventory as indicated by RPV level LESS THAN 63% RVLIS Full Range **OR** b. RPV level cannot be monitored with Indication of core uncovery as evidenced by one or more of the following: ▪ Containment High Range Radiation Monitor (R48 or R49) reading > 5 R/hr ▪ Erratic Source Range Monitor Indication
HU1.6	Uncontrolled flooding in Table H-1 areas that has the potential to affect safety related equipment needed for the current operating mode
HA1.5	Uncontrolled flooding in any Table H-1 area of the plant that results in degraded safety system performance as indicated in the control room or that creates industrial safety hazards (e.g., electric shock) that precludes access necessary to operate or monitor safety equipment.
RA2.2	Report of visual observation of irradiated fuel uncovered **OR** Loss of water inventory as indicated by inadequate makeup rate that will result in irradiated fuel uncovering.

EAL ID	EAL
RA3.1	VALID radiation monitor readings GREATER THAN 15 mR/hr in areas requiring continuous occupancy to maintain plant safety functions: Control Room (Rad monitor R-1) **OR** Central Alarm Station (by portable radiation monitoring instrumentation)
RA3.2	Any VALID radiation monitor reading GREATER THAN 12 R/hr in areas requiring infrequent access to maintain plant safety functions (Table H-1).
SU6.1	Loss of all Table C-1 onsite communications capability affecting the ability to perform routine operations.
SU6.2	Loss of all Table C-2 offsite communications capability.
SU8.1	An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

ENCLOSURE 4

MARKED-UP NEI TECHNICAL BASIS DOCUMENT, PROPOSED TECHNICAL BASIS DOCUMENT, JUSTIFICATION MATRICES, AND PROPOSED EMERGENCY PLAN CHANGES

ATTACHMENT 1

MARKED-UP NEI TECHNICAL BASIS DOCUMENT

Legend

- ~~red strikeout text~~ = Text removed from the NEI 99-01 Technical Basis Document for development of site specific EALs.
- green text = Text added to the NEI 99-01 Technical Basis Document for development of site specific EALs.

Emergency Action Level Technical Bases Document

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LIST OF TABLES

ACRONYMS

AC	Alternating Current
ATWS	Anticipated Transient Without Scram
CCW	Component Cooling Water
CDE	Committed Dose Equivalent
CFR	Code of Federal Regulations
CL	Cooling Water
CTMT	Containment
CSF	Critical Safety Function
CSFST	Critical Safety Function Status Tree
DC	Direct Current
DHR	Decay Heat Removal
DOT	Department of Transportation
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
ECL	Emergency Classification Level
EDG	Emergency Diesel Generator
ED	Emergency Director
EOF	Emergency Operations Facility
EOP	Emergency Operating Procedure
EPA	Environmental Protection Agency
EPIP	Emergency Plan Implementing Procedure
ERCS	Emergency Response Computer System
EPRI	Electric Power Research Institute
~~ERG~~	~~Emergency Response Guideline~~
ESF	Engineered Safeguards Feature
ESW	Emergency Service Water
FEMA	Federal Emergency Management Agency
~~FSAR~~	~~Final Safety Analysis Report~~
GE	General Emergency
~~HPSI~~	~~High Pressure Safety Injection~~
IC	Initiating Condition

IDLH	Immediately Dangerous to Life and Health
IPEEE	Individual Plant Examination of External Events (Generic Letter 88-20)
ISFSI	Independent Spent Fuel Storage Installation
LCO	Limiting Condition of Operation
LER	Licensee Event Report
LFL	Lower Flammability Limit
LOCA	Loss of Coolant Accident
~~LPSI~~	~~Low Pressure Safety Injection~~
MSIV	Main Steam Isolation Valve
MSL	Mean Sea Level
mR	milliRem
~~Mw~~MW	Megawatt
NEI	Nuclear Energy Institute
NESP	National Environmental Studies Project
NRC	Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
NUMARC	Nuclear Management and Resources Council
OBE	Operating Basis Earthquake
ODCM	Offsite Dose Calculation Manual
PAG	Protective Action Guide
PINGP	Prairie Island Nuclear Generating Plant
PRA~~/PSA~~	Probabilistic Risk Assessment~~/ Probabilistic Safety Assessment~~
PWR	Pressurized Water Reactor
PSIG	Pounds per Square Inch Gauge
R	~~Rem~~Roentgen
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RVLIS	Reactor Vessel Level Indicating System
SAE	Site Area Emergency
SG	Steam Generator
SI	Safety Injection
SFP	Spent Fuel Pool

~~SPDS~~	~~Safety Parameter Display System~~
SRO	Senior Reactor Operator
~~SSE~~	~~Safe Shutdown Earthquake~~
TEDE	Total Effective Dose Equivalent
TOAF	Top of Active Fuel
TSC	Technical Support Center
UE	Notification Of Unusual Event
USAR	Updated Safety Analysis Report
WE	Westinghouse Electric
WOG	Westinghouse Owners Group

1. PURPOSE

This document provides the detailed set of Emergency Action Levels (EALs) applicable to the Prairie Island Nuclear Generating Plant (PINGP) and the associated Technical Bases using the EAL development methodology found in NEI 99-01 Revision 4 [Ref. 2.1]. Personnel responsible for making emergency declarations may use this document as a technical reference and an aid in EAL interpretation.

The primary tool for determining the emergency classification level is the Emergency Action Level Matrix. The user of the Emergency Action Level Matrix may (but is not required to) consult the EAL Technical Basis Document in order to obtain additional information concerning the EALs under classification consideration.

2. REFERENCES

2.1 NEI 99-01 Revision 4, Methodology for Development of Emergency Action Levels

2.2 PINGP Technical Specifications Table 1.1-1

3. DISCUSSION

3.1 Background

EALs are the plant-specific indications, conditions or instrument readings that are utilized to classify emergency conditions defined in the PINGP Emergency Plan.

~~In 1992, the NRC endorsed NUMARC/NESP-007 "Methodology for Development of Emergency Action Levels" as an alternative to NUREG 0654 EAL guidance.~~

NEI 99-01 (NUMARC/NESP-007) Revision 4 represents the most recently NRC endorsed methodology per RG 1.101 Rev 4, "Emergency Planning and Preparedness for Nuclear Power Reactors." Enhancements over earlier revisions included:

- Consolidating the system malfunction initiating conditions and example emergency action levels which address conditions that may be postulated to occur during plant shutdown conditions.

- Addressing initiating conditions and example emergency action levels that fully address conditions that may be postulated to occur at permanently Defueled Stations and Independent Spent Fuel Storage Installations.

Using NEI 99-01 Rev. 4, PINGP conducted an EAL implementation upgrade project that produced the EALs discussed herein. While the upgraded EALs are site-specific, an objective of the project was to ensure to the extent possible EAL conformity and consistency between the NMC plant sites.

3.2 Key Definitions in EAL Methodology

The following definitions apply to the generic EAL methodology:

EMERGENCY CLASS: One of a minimum set of names or titles, established by the Nuclear Regulatory Commission (NRC), for grouping of normal nuclear power plant conditions according to (1) their relative radiological seriousness, and (2) the time sensitive onsite and off site radiological emergency preparedness actions necessary to respond to such conditions. The existing radiological emergency classes, in ascending order of seriousness, are called:

- Notification of Unusual Event (UE)
- Alert
- Site Area Emergency (SAE)
- General Emergency (GE)

Section 3.3 provides further discussion of the emergency classes.

INITIATING CONDITION (IC): One of a predetermined subset of nuclear power plant conditions when either the potential exists for a radiological emergency, or such an emergency has occurred.

- An IC is an emergency condition which sets it apart from the broad class of conditions that may or may not have the potential to escalate into a radiological emergency.
- It can be a continuous, measurable function that is outside technical specifications, such as elevated RCS temperature or falling reactor coolant level (a symptom).
- It also encompasses occurrences such as FIRE (an event) or reactor coolant pipe failure (an event or a barrier breach).

EMERGENCY ACTION LEVEL (EAL): A predetermined, site-specific, observable threshold for a plant Initiating Condition that places the plant in a given emergency class. An EAL can be: an instrument reading; an equipment status indicator; a measurable parameter (onsite or offsite); a discrete, observable event; results of analyses; entry into specific emergency operating procedures; or another phenomenon which, if it occurs, indicates entry into a particular emergency class.

- There are times when an EAL will be a threshold point on a measurable continuous function, such as a primary system coolant leak that has exceeded technical specifications.
- At other times, the EAL and the IC will coincide, both identified by a discrete event that places the plant in a particular emergency class.

3.3 Recognition Categories

ICs and EALs are grouped in one of several categories. This classification scheme incorporates symptom-based, event-based, and barrier-based ICs and EALs.

- R - Abnormal Rad Levels/Radiological Effluent
- C - Cold Shutdown~~.~~/ Refueling System Malfunction
- E - Independent Spent Fuel Storage Installation (ISFSI)
- F - Fission Product Barrier Degradation
- H - Hazards
- S - System Malfunction

Some recognition categories are further divided into one or more subcategories depending on the types and number of plant conditions that dictate emergency classifications. An EAL may or may not exist for each subcategory at all four classification levels. Similarly, more than one EAL may exist for a subcategory in a given emergency classification when appropriate (i.e., no EAL at the General Emergency level but three EALs at the Unusual Event level).

3.4 Emergency Class Descriptions

There are three considerations related to the emergency classes. These are:

- The potential impact on radiological safety, either ~~as now~~currently known or as can be reasonably projected.
- How far the plant is beyond its predefined design, safety and operating envelopes.
- Whether or not conditions that threaten health are expected to be confined ~~to~~ within the site boundary.

The ICs deal explicitly with radiological safety affect by escalating from levels corresponding to releases within regulatory limits to releases beyond Environmental Protection Agency (EPA) Protective Action Guideline (PAG) plume exposure levels.

NOTIFICATION OF UNUSUAL EVENT: Events are in process or 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.

- Potential degradation of the level of safety of the plant is indicated primarily by exceeding plant technical specification Limiting Condition of Operation (LCO) allowable action statement time for achieving required mode change.
- Precursors of more serious events may be included because precursors represent a potential degradation in the level of safety of the plant.

- Minor releases of radioactive materials are included. In this emergency class, however, releases do not require monitoring or offsite response (e.g., dose consequences of less than 10 millirem).

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.

SITE AREA EMERGENCY: Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

- The discriminator (threshold) between Site Area Emergency and General Emergency is whether or not the EPA PAG plume exposure levels are expected to be exceeded outside the site boundary.

- This threshold, in addition to dynamic dose assessment considerations discussed in the EAL guidelines, clearly addresses NRC and offsite emergency response agency concerns as to timely declaration of a General Emergency.

GENERAL EMERGENCY: Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

- The bottom line for the General Emergency is whether evacuation or sheltering of the general public is ~~indicated~~ required based on EPA PAGs and, therefore, should be interpreted to include radionuclide release regardless of cause.

- To better assure timely notification, EALs in this category are primarily expressed in terms of plant function status, with secondary reliance on dose projection. In terms of fission product barriers, loss of two barriers with loss or potential loss of the third barrier constitutes a General Emergency.

3.5 Operating Mode Applicability

Technical Specifications [Ref. 2.2] provides definitions for the following operating modes:

1 Power Operation

K_{eff} GREATER THAN OR EQUAL TO 0.99 and rated thermal power GREATER THAN 5%.

2 Startup

K_{eff} GREATER THAN OR EQUAL TO 0.99 and rated thermal power LESS THAN OR EQUAL TO 5%.

3 Hot Standby

K_{eff} LESS THAN 0.99 and average reactor coolant temperature (Tavg) GREATER THAN OR EQUAL TO 350°F.

4 <u>Hot Shutdown</u>

K_{eff} LESS THAN 0.99 and average reactor coolant temperature (Tavg) LESS THAN 350°F AND GREATER THAN 200°F with all reactor vessel head closure bolts fully tensioned.

5 <u>Cold Shutdown</u>

K_{eff} LESS THAN 0.99 and average reactor coolant temperature (Tavg) LESS THAN OR EQUAL TO 200°F with all reactor vessel head closure bolts fully tensioned.

6 <u>Refueling</u>

One or more reactor vessel head closure bolts less than fully tensioned.

In addition to the Technical Specification operating modes, NEI 99-01 [Ref. 2.1] defines the following additional mode:

D <u>Defueled</u>

All reactor fuel removed from Reactor Vessel (full core off load during refueling or extended outage)

The plant operating mode that exists at the time that the event occurs (prior to any protective system or operator action is initiated in response to the condition) should be compared to the mode applicability of the EALs. If a lower or higher plant operating mode is reached before the emergency classification is made, the declaration shall be based on the mode that existed at the time the event occurred.

Recognition categories are associated with the operating modes listed in the following matrix:

	Recognition Category					
Mode	R	C	E	F	H	S
1 - Power Operations	X			X	X	X
2 - Startup	X			X	X	X
3 - Hot Standby	X			X	X	X
4 - Hot Shutdown	X			X	X	X

	Recognition Category					
Mode	R	C	E	F	H	S
5 - Cold Shutdown	X	X			X	
6 - Refueling	X	X			X	
D - Defueled	X	X			X	
N/A			X			

3.6 Fission Product Barriers

Many of the EALs derived from the NEI methodology are fission product barrier based. That is, the conditions that define the EALs are based upon loss of or potential loss to one or more of the three fission product barriers. "Loss" and "potential loss" signify the relative damage and threat of damage to the barrier. "Loss" means the barrier no longer assures containment of radioactive materials and "potential loss" means imminent loss of the barrier.

The primary fission product barriers are:

- Fuel Cladding (FC): Zirconium tubes which house the ceramic uranium oxide pellets along with the end plugs which are welded into each end of the fuel rods comprise the FC barrier.
- Reactor Coolant System (RCS): The reactor vessel shell, vessel head, vessel nozzles and penetrations and all primary systems directly connected to the reactor vessel up to the first containment isolation valve comprise the RCS barrier.
- Containment (CTMT): The vapor containment structure and all isolation valves required to maintain containment integrity under accident conditions comprise the Containment barrier.

3.7 Emergency Classification Based on Fission Product Barrier Degradation

The following criteria are the bases for event classification related to fission product barrier loss or challenge:

- Notification of Unusual Event:

  Any loss or any potential loss of Containment

- Alert:

  Any loss or any potential loss of either Fuel Cladding or RCS

- Site Area Emergency:

  Loss or potential loss of any two barriers

- General Emergency:

  Loss of any two barriers and loss or potential loss of third barrier

3.8 EAL Relationship to EOPs and Critical Safety Function Status

Where possible, the EALs have been made consistent with and utilize the conditions defined in the ~~PBNP~~ PINGP Critical Safety Function Status Trees (CSFSTs). While the symptoms that drive operator actions specified in the CSFSTs are not indicative of all possible conditions which warrant emergency classification, they define the symptoms, independent of initiating events, for which reactor plant safety and/or fission product barrier integrity are threatened. Where these symptoms are clearly representative of one of the NEI Initiating Conditions, they have been utilized as an EAL. This permits rapid classification of emergency situations based on plant conditions without the need for additional evaluation or event diagnosis. Although some of the EALs presented here are based on conditions defined in the CSFSTs, classification of emergencies using these EALs is not dependent upon Emergency Operating Procedures (EOP) entry or execution. The EALs can be utilized independently or in conjunction with the EOPs.

3.9 Symptom Based vs. Event Based Approach

To the extent possible, the EALs are symptom based. That is, the action level is defined by values of key plant operating parameters that identify emergency or potential emergency conditions. This approach is appropriate because it allows the full scope of variations in the types of events to be classified as emergencies. But, a purely symptom based approach is not sufficient to address all events for which emergency classification is appropriate. Particular events to which no predetermined symptoms can be ascribed have also been utilized as EALs since they may be indicative of potentially more serious conditions not yet fully realized.

Category R - Abnormal Rad Levels/Radiological Effluent and Category F - Fission Product Barrier Degradation are primarily symptom-based. The symptoms are indicative of actual or potential degradation of either fission product barriers or personnel safety.

Other categories tend to be event-based. For example, System Malfunctions are abnormal and emergency events associated with vital plant system failures, while Hazards are those non-plant system related events that have affected or may affect plant safety.

3.10 Treatment of Multiple Units and Emergency Class Upgrading

The emergency classification is based on the highest EAL reached for the site. For example, two Alerts remain in the Alert ~~category~~classification. Or~~,~~ for an Alert and a Site Area Emergency~~ is~~, a Site Area Emergency is the required classification.

Since ~~PBNP~~ PINGP is a dual-unit plant, emergency class upgrading must consider the effects of a loss of a common system on the other unit. For example, the control panels for both units share the same room. Thus, control room evacuation most likely would affect both units. There are a number of other systems and functions which may be shared. This must be considered in the emergency class declaration.

3.11 Emergency Class Downgrading

Another important aspect of usable EAL guidance is the consideration of what to do when the risk posed by an emergency is clearly decreasing.

It is recommended that a combination approach involving recovery from General Emergencies and some Site Area Emergencies and termination from UEs, Alerts, and certain Site Area Emergencies causing no long-term plant damage. Downgrading to lower emergency classes adds notifications but may have merit under certain circumstances.

3.12 Classifying Transient Events

For some events, the condition may be corrected before a declaration has been made. For example, an emergency classification is warranted when automatic and manual actions taken within the control room do not result in a required reactor trip. However, it is likely that actions taken outside of the control room will be successful, probably before the Emergency Director (ED) classifies the event. The key consideration in this situation is to determine whether or not further plant damage occurred while the corrective actions were being taken. In some situations, this can be readily determined, in other situations, further analyses (e.g., coolant sampling, may be necessary).

In general, observe the following guidance: Classify the event as indicated and terminate the emergency once assessment shows that there were no consequences from the event and other termination criteria are met. For example, a momentary event, such as an ATWS or an earthquake, requires declaration even though the condition may have been resolved by the time the declaration is made.

- An ATWS represents a failure of a front line safety system (RPS) designed to protect the health and safety of the public.
- The affect of an earthquake on plant equipment and structures may not be readily apparent until investigations are conducted.

There may be cases in which a plant condition that exceeded an EAL threshold was not recognized at the time of occurrence, but is identified well after the condition has occurred (e.g., as a result of routine log or record review) and the condition no longer exists. In these cases, an emergency should not be declared. Reporting requirements of 10 CFR 50.72 are applicable and the guidance of NUREG-1022, Rev. 1, Section 3 should be applied.

3.13 Imminent EAL Thresholds

Although the majority of the EALs provide very specific thresholds, the ~~Emergency Director~~ED must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the ~~Emergency~~

~~Director~~ED, an imminent situation is at hand, the classification should be made as if the thresholds has been exceeded. While this is particularly prudent at the higher emergency classes (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all emergency classes. Explicit EALs, specifying use of ~~Emergency Director~~ED judgment, are given in the Hazards, ISFSI and Fission Product Barrier Degradation categories.

4. TECHNICAL BASES INFORMATION

4.1 Recognition Category Organization

The technical bases of the EALs are provided under Recognition Categories R, C, E, F, H and S of this document. A table summarizing the Initiating Conditions introduces each category. The tables provide an overview of how the ICs are related under each emergency class. ICs within each category are listed according to classification (as applicable) in the following order: Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency.

For Recognition Category F, Table F-0 defines the emergency classifications associated with barrier loss and potential loss. Table F-1 lists the thresholds associated with the loss and potential loss of each fission product barrier. The presentation method shown for Table F-1 was chosen to clearly show the synergism among the EALs and to support more accurate dynamic assessments. Basis discussion of the thresholds immediately follows Table F-1.

4.2 Initiating Condition Structure

ICs in Recognition Categories R, C, E, H and S are structured in the following manner:

- Recognition Category Title
- IC Identifier:
  - First character identifies the category by letter (R, C, E, H and S)
  - Second character identifies the emergency classification level (U for Notification of Unusual Event, A for Alert, S for Site Area Emergency, and G for General Emergency)
  - Third character is the numerical sequence as given in Revision 4 of NEI 99-01 [Ref. 2.1] (e.g., SA2). Due to document revisions, certain NEI ICs have been deleted, leaving gaps in the numerical sequence.
- Emergency Class: Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency
- IC Description
- Operating Mode Applicability: Refers to the operating mode during which the IC/EAL is applicable

- Emergency Action Level(s): EALs are the conditions applicable to the criteria of the IC and are used to determine the need to classify an event/condition. If more than one EAL is applicable to an IC, emergency classification is required when any EAL within the IC reaches the EAL threshold. To clarify this intent, ICs with multiple EALs include a parenthetical phrase in the EAL title line, indicating that each constitutes an emergency classification. For example, the phrase "(RU1.1 or RU1.2)" indicates that either EAL is a Notification of Unusual Event.

- Basis: Provides information that explains the IC and EAL(s). Plant source document references are provided as needed to substantiate site-specific information included in the EALs and bases.

4.3 EAL Identification

The EAL identifier is the IC identifier followed by a period and sequence number (e.g., RU1.1, RU1.2, etc.). If only one EAL is assigned to an IC, the EAL is given the number one.

The primary purpose of the EAL identifier is to uniquely distinguish each classifiable condition. Secondary purposes are to assist location of an EAL within the EAL classification scheme and to announce the emergency classification level.

5. DEFINITIONS

In the ICs and EALs, selected words are in uppercase print. These words are defined terms. Definitions are provided below.

AFFECTING SAFE SHUTDOWN: Eevent in progress that has adversely affected functions that are necessary to bring the plant to and maintain it in the applicable HOT or COLD SHUTDOWN condition. Plant condition applicability is determined by Technical Specification LCOs in effect.

Example 1: Event causes damage that results in entry into an LCO that requires the plant to be placed in HOT SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event is not "AFFECTING SAFE SHUTDOWN."

Example 2: Event causes damage that results in entry into an LCO that requires the plant to be placed in COLD SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event is "AFFECTING SAFE SHUTDOWN."

BOMB refers to an explosive device suspected of having sufficient force to damage plant systems or structures.

CIVIL DISTURBANCE is a group of ~~(site-specific #)~~two or more persons violently protesting station operations or activities at the site.

CONFINEMENT BOUNDARY is the barrier(s) between areas containing radioactive substances and the environment.

CONTAINMENT CLOSURE is defined by EOP 1E-4, Core Cooling Following Loss of RHR Flow, Attachment I, Containment Closure Procedure. All Containment penetrations having one or more isolation valves closed and one door in each airlock penetration closed.

EXPLOSION is a rapid, violent, unconfined combustion, or catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.

EXTORTION is an attempt to cause an action at the station by threat of force.

FAULTED: I~~i~~n a steam generator, the existence of secondary side leakage that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE is combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute FIREs. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

HOSTAGE is a person(s) held as leverage against the station to ensure that demands will be met by the station.

HOSTILE FORCE: O~~o~~ne or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH): A condition that either poses an immediate threat to life and health or an immediate threat of severe exposure to contaminants which are likely to have adverse delayed effects on health.

INTRUSION / INTRUDER is a person(s) present in a specified area without authorization. Discovery of a BOMB in a specified area is indication of INTRUSION into that area by a HOSTILE FORCE.

LOWER FLAMMABILITY LIMIT (LFL): The minimum concentration of a combustible substance that is capable of propagating a flame through a homogenous mixture of the combustible and a gaseous oxidizer.

NORMAL PLANT OPERATIONS: A~~a~~ctivities at the plant site associated with routine testing, maintenance, or equipment operations, in accordance with normal operating or administrative procedures. Entry into abnormal or emergency operating procedures, or deviation from normal security or radiological controls posture, is a departure from NORMAL PLANT OPERATIONs.

PROTECTED AREA the area encompassing all controlled areas within the security protected area fence as shown in ~~boundary is within the security isolation zone and is defined in~~ USAR Figure 1.1-3, Site Plan Prairie Island Security Fence.

RUPTURED: In a steam generator, existence of primary-to-secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection.

SABOTAGE is deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable. Equipment found tampered with or damaged due to malicious mischief may NOT meet the definition of SABOTAGE until this determination is made by security supervision.

SIGNIFICANT TRANSIENT is an UNPLANNED event involving one or more of the following: (1) A~~a~~utomatic T~~t~~urbine R~~r~~unback >25% ~~thermal~~ R~~r~~eactor P~~p~~ower, (2) ~~electrical~~ L~~l~~oad R~~r~~ejection >25% F~~f~~ull ~~electrical~~ L~~l~~oad, (3) Reactor Trip, (4) Safety Injection ~~Activation~~Actuation, or (5) ~~thermal~~ Reactor P~~p~~ower O~~o~~scillations >10%.

STRIKE ACTION is a work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on PINGP. The STRIKE ACTION must threaten to interrupt NORMAL PLANT OPERATIONs.

UNPLANNED: A parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

VALID: An indication, report, or condition is considered to be VALID when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator operability, the condition existence, or the report accuracy is removed. Implicit in this definition is the need for timely assessment.

VISIBLE DAMAGE is damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.

VITAL AREA is any area, normally within the PROTECTED AREA, which contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

6. EMERGENCY ACTION LEVEL BASES

Initiating Conditions (ICs), Emergency Action Levels (EALs) and EAL bases are provided in the following tables.

R - Abnormal Rad Levels/Radiological Effluent, Table R-0

C - Cold Shutdown / Refueling System Malfunction, Table C-0

E - Independent Spent Fuel Storage Installation (ISFSI), Table E-0

F - Fission Product Barrier Degradation, Table F-0

H – Hazards, Table H-0

S - System Malfunction, Table S-0

Table ~~5-A-1~~R-0

Recognition Category ~~A~~R

Abnormal Rad Levels / Radiological Effluent

INITIATING CONDITION MATRIX

N~~O~~UE	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
RAU1 Any UNPLANNED Release of Gaseous or Liquid Radio-activity to the Environment that Exceeds Two Times the Offsite Dose Calculation Manual Specification ~~Radiological Effluent Technical Specifications~~ for 60 Minutes or Longer. *Op. Modes: All*	**RAA1** Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Offsite Dose Calculation Manual Specification~~Radiological Effluent Technical Specifications~~ for 15 Minutes or Longer. *Op. Modes: All*	**RAS1** Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mRem TEDE or 500 mRem Thyroid CDE for the Actual or Projected Duration of the Release. *Op. Modes: All*	**RAG1** Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology. *Op. Modes: All*
RAU2 Unexpected Increase in Plant Radiation. *Op. Modes: All*	**RAA3** Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown *Op. Modes: All*		
	RAA2 Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel. *Op. Modes: All*		

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ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

RAU1

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the ~~Radiological Effluent Technical Specifications~~Offsite Dose Calculation Manual Specification for 60 Minutes or Longer.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (RU1.1 or RU1.2 or RU1.3~~ or 4 or 5~~)

RU1.1. VALID reading on any effluent monitor that exceeds two times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.

RU1.2. VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 60 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds				
Monitor	**GE**	**SAE**	**Alert**	**UE**
Gaseous				
1(2) R-50 High Range Stack Gas Monitor	3300 mR/hr	330 mR/hr	N/A	N/A
1(2) R-22* Shield Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
2R-30* & 2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
Liquid				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-19*SG Blowdown Radiation Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-21 Circ Water Discharge Monitor	N/A	N/A	200 X Alarm	2 X Alarm

* with Effluent discharge not isolated

~~(site specific list)~~

RU1.3. Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates, with a release duration of 60 minutes or longer, in excess of two times ~~(site-specific technical specifications)~~ ODCM specification.

~~4. VALID reading on perimeter radiation monitoring system greater than 0.10 mR/hr above normal background sustained for 60 minutes or longer [for sites having telemetered perimeter monitors].~~

~~5. VALID indication on automatic real-time dose assessment capability greater than (site-specific value) for 60 minutes or longer [for sites having such capability].~~

Basis:

~~*Refer to Appendix A for a detailed basis of the radiological effluent IC/EALs.*~~

This IC addresses a potential or actual decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. ~~Nuclear power plants~~PINGP incorporates features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, or control and monitor intentional releases. These controls are located in the Offsite Dose Calculation Manual (ODCM) [Ref. 3, 5]~~, and for plants that have not implemented Generic Letter 89-01, in the Radiological Effluent Technical Specifications (RETS).~~. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of a degradation in these features and/or controls. ~~Some sites may find it advantageous to address gaseous and liquid releases with separate initiating conditions and EALs.~~

The ~~RETS~~ ODCM specification multiples are specified in ICs ~~AU1~~ RU1 and ~~AA1~~ RA1 only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an offsite dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, NOT the magnitude of the associated dose or dose rate. Releases should not be prorated or averaged. For example, a release exceeding 4x ~~RETS~~ ODCM specification for 30 minutes does not meet the threshold for this IC.

UNPLANNED, as used in this context, includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit. The Emergency Director should not wait until 60 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 60 minutes. Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Director should, in the absence of data to the contrary, assume that the release has exceeded 60 minutes.

~~EAL #1~~RU1.1 is intended for effluent monitoring on routine release pathways for which a discharge permit is normally prepared. This EAL addresses radioactivity releases, that for whatever reason, cause effluent radiation monitor readings to exceed two times the alarm setpoint established by a current radioactivity discharge permit~~Technical Specification limit~~ and releases are not terminated within 60 minutes. ~~This~~ These alarm setpoints ~~may be~~are associated with a planned batch release, or a continuous release path. In either case, the setpoint is established by the ODCM to warn of a release that is not in compliance with the ~~RETS~~ODCM specification. Indexing the EAL threshold to the ODCM setpoints in this manner ~~i~~ensures that the EAL threshold will never be less than the setpoint established by a specific discharge permit.

~~EAL #2~~RU1.2 is intended for ~~licensees that have established~~ effluent monitoring on non-routine release pathways for which a discharge permit would not normally be prepared. The ODCM establishes a methodology for determining effluent radiation monitor setpoints. The ODCM specifies default source terms and, for gaseous releases, prescribes the use of pre-determined annual average meteorology in the most limiting downwind sector for showing compliance with the regulatory commitments. These monitor reading EALs ~~should be~~have been determined using this methodology. The specific effluent monitor setpoints are changed or managed based on monitor recalibrations and planned plant processes to ensure the final ODCM specification limits are not exceeded. As a result the EAL uses thresholds expressed as 2 times the alarm setpoints.

~~EAL #3~~RU1.3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

~~The 0.10 mR/hr value in EAL #4 is based on a release rate not exceeding 500 mrem per year, as provided in the ODCM / RETS, prorated over 8766 hours, multiplied by two, and rounded. (500 ÷ 8766 × 2 = 0.114). This is also the basis of the site specific value in EAL #5.~~

~~EALs #1 and #2~~RU1.1 and RU1.2 directly correlate with the IC since annual average meteorology is required to be used in showing compliance with the ~~RETS~~ ODCM specifications and is used in calculating the alarm setpoints. ~~EALs #4 and #5 are a function of actual meteorology, which will likely be different from the limiting annual average value. Thus, there will likely be a numerical inconsistency. However, t~~The fundamental basis of this IC is NOT a dose or dose rate, but rather the degradation in the level of safety of the plant implied by the uncontrolled release. ~~Exceeding EAL #4 or EAL #5 is an indication of an uncontrolled release meeting the fundamental basis for this IC.~~

PINGP Basis Reference(s):

1. ODCM Section 3.0 Gaseous Effluents
2. ODCM Section 5.1 Gaseous Effluent Monitor Setpoint Determination
3. ODCM Section 2.0 Liquid Effluents
4. ODCM Section 4.1 Liquid Effluent Monitor Setpoint Determination
5. ODCM Appendix A

~~AU2~~RU2

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Unexpected Increase in Plant Radiation.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (RU2.1 or RU2.2)

RU2.1. ~~a.~~ VALID ~~(site-specific)~~ indication of uncontrolled water level decrease in the reactor refueling cavity, spent fuel pool, or fuel transfer canal with all irradiated fuel assemblies remaining covered by water as indicated by level LESS THAN SFP low water level alarm, Refueling Canal Level, or visual observation (752.5 feet elevation).

AND

~~b.~~ Any UNPLANNED VALID ~~(site-specific) Direct~~ Area Radiation Monitor reading increases as indicated by:

- R-5 Fuel Handling Area Monitor reading
- R-28 New Fuel Pool Criticality Area Monitor
- 1(2) R-2 Containment Vessel Area Monitor
- Other Portable Area Radiation Monitoring Instrumentation

RU2.2. Any UNPLANNED VALID ~~Direct~~ Area Radiation Monitor reading~~s~~ increases by a factor of 1000 over normal* levels.

*Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value.

Basis:

This IC addresses increased radiation levels as a result of water level decreases above the RPV flange or events that have resulted, or may result, in unexpected increases in radiation dose rates within plant buildings. These radiation increases represent a loss of control over radioactive material and may represent a potential degradation in the level of safety of the plant.

In light of Reactor Cavity Seal failure incidents at two different PWRs and loss of water in the Spent Fuel Pit/Fuel Transfer Canal at a BWR, explicit coverage of these types of events via ~~EAL~~

~~#1~~RU2.1 is appropriate given their potential for increased doses to plant staff. Classification as an ~~NO~~UE is warranted as a precursor to a more serious event. ~~Site-specific i~~Indications ~~may~~ include instrumentation such as water level and local area radiation monitors, and personnel (e.g., refueling crew) reports. If available, ~~security~~ video cameras may allow remote observation. There is sufficient~~Depending on available~~ level instrumentation such that, the declaration threshold ~~may~~ does not need to be based on indications of water makeup rate or decrease in refueling water storage tank level.

While a radiation monitor could detect an increase in dose rate due to a drop in the water level, it might not be a reliable indication of whether or not the fuel is covered. For example, the reading on an area radiation monitor located on the refueling bridge may increase due to planned evolutions such as head lift, or even a fuel assembly being raised in the manipulator mast. Generally, increased radiation monitor indications will need to be combined with another indicator (or personnel report) of water loss. For refueling events where the water level drops below the RPV flange classification would be via CU2. This event escalates to an Alert per IC ~~AA2~~ RA2 if irradiated fuel outside the reactor vessel is uncovered. For events involving irradiated fuel in the reactor vessel, escalation would be via the Fission Product Barrier Matrix for events in operating modes 1-4.

The Spent Fuel Pool (SFP) low level alarm(s) is actuated by LA-634 (SER 055) and LA-639 (SER 067) at 752.5 feet elevation [Ref. 2, 3, 4, 5, 6]. Visual indication also provides indication of possible uncontrolled loss of water level. The Spent Fuel Pool is located in the Auxiliary Building refueling enclosure. During refueling periods, the Spent Fuel Pool is connected to the Refueling Cavity so the SFP level alarm may indicate loss of water inventory in the SFP, transfer canal, or Refueling Cavity.

The movement of spent fuel assemblies within containment requires a minimum water level of 23 ft above the top of the reactor vessel flange [Ref. 7]. During Refueling mode, this maintains sufficient water level in the containment, fuel transfer canal, refueling cavity, and spent fuel pool.

The following area radiation monitors would detect increasing area radiation levels due to a lowering SFP or refueling cavity level [Ref. 1, 8]:

- R-5 Fuel Handling Area Monitor reading
- R-28 New Fuel Pool Criticality Area Monitor
- 1(2) R-2 Containment Vessel Area Monitor
- Temporary or portable radiation monitoring instrumentation should also be considered when evaluating this EAL.

~~EAL #2~~RU2.2 addresses UNPLANNED increases in in-plant radiation levels that represent ~~a degradation~~degradation in the control of radioactive material, and represent a potential degradation in the level of safety of the plant. This event escalates to an Alert per IC ~~AA3~~ RA3 if the increase in dose rates impedes personnel access necessary for safe operation.

PINGP Basis Reference(s):

1. C16 AOP-1 Loss of SFP Inventory
2. D5.2 AOP-3 DECREASING REFUELING WATER LEVEL DURING REFUELING
3. Annunciator 47016-0101, 121 SPENT FUEL PIT LO LVL

4. Annunciator 47016-0401, 122 SPENT FUEL PIT LO LVL
5. Annunciator 47516-0101, 121 SPENT FUEL PIT LO LVL
6. Annunciator 47516-0401, 122 SPENT FUEL PIT LO LVL
7. Technical Specification 3.9.2 Refueling Cavity Water Level
8. B-11 Radiation Monitoring System

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

~~AA1~~RA1

Initiating Condition – ALERT

Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the ~~Radiological Effluent Technical Specifications~~Offsite Dose Calculation Manual Specification for 15 Minutes or Longer.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (RA1.1 or RA1.2 or RA1.3~~ or 4 or 5~~)

RA1.1. VALID reading on any effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer.

RA1.2. VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 15 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds				
Monitor	**GE**	**SAE**	**Alert**	**UE**
<u>Gaseous</u>				
1(2) R-50 High Range Stack Gas Monitor	3300 mR/hr	330 mR/hr	N/A	N/A
1(2) R-22* Shield Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
2R-30* & 2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
<u>Liquid</u>				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-19*SG Blowdown Radiation Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-21 Circ Water Discharge Monitor	N/A	N/A	200 X Alarm	2 X Alarm

* with Effluent discharge <u>not</u> isolated

~~(site-specific list)~~

RA1.3. Confirmed sample analysies for gaseous or liquid releases indicates concentrations or release rates, with a release duration of 15 minutes or longer, in excess of 200 times ~~(site-specific technical specifications)~~ ODCM specification.

~~4. VALID reading on perimeter radiation monitoring system greater than 10.0 mR/hr above normal background sustained for 15 minutes or longer [for sites having telemetered perimeter monitors].~~

~~5. VALID indication on automatic real-time dose assessment capability greater than (site-specific value) for 15 minutes or longer [for sites having such capability].~~

Basis:

~~*Refer to Appendix A for a detailed basis of the radiological effluent IC/EALs.*~~

This IC addresses a potential or actual decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. ~~Nuclear power plants~~PINGP incorporates features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, or control and monitor intentional releases. These controls are located in the Offsite Dose Calculation Manual (ODCM) [Ref. 3, 5]~~), and for plants that have not implemented Generic Letter 89-01, in the Radiological Effluent Technical Specifications (RETS)~~. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of ~~a degradation~~degradation in these features and/or controls. ~~Some sites may find it advantageous to address gaseous and liquid releases with separate initiating conditions and EALs.~~

The ~~RETS~~ ODCM specification multiples are specified in ICs ~~AU1~~ RU1 and ~~AA1~~ RA1 only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an offsite dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, NOT the magnitude of the associated dose or dose rate. Releases should not be prorated or averaged.

UNPLANNED, as used in this context, includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit. The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes. Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Director should, in the absence of data to the contrary, assume that the release has exceeded 15 minutes.

~~EAL #1~~RA1.1 is intended for effluent monitoring on routine release pathways for which a discharge permit is normally prepared. This EAL addresses radioactivity releases that for whatever reason cause effluent radiation monitor readings that exceed two hundred times the alarm setpoint established by the radioactivity discharge permit for greater than 15 minutes. ~~This~~ These alarm setpoints ~~may be~~are associated with a planned batch release, or a continuous release path. In either case, the setpoint is established by the ODCM to warn of a release that is not in compliance with the ~~RETS~~ODCM specification. Indexing the EAL threshold to the ODCM setpoints in this manner insures that the EAL threshold will never be less than the setpoint established by a specific discharge permit.

~~EAL #~~RA1.2 is similar to ~~EAL #~~RA1.1, but is intended to address effluent or accident radiation monitors on non-routine release pathways (i.e., for which a discharge permit would not normally be prepared). The ODCM establishes a methodology for determining effluent radiation monitor setpoints. The ODCM specifies default source terms and, for gaseous releases, prescribes the use of pre-determined annual average meteorology in the most limiting downwind sector for showing compliance with the regulatory commitments. These monitor reading EALs ~~should be~~have been determined using this methodology. The specific effluent monitor setpoints are changed or managed based on monitor recalibrations and planned plant processes to ensure the final ODCM specification limits are not exceeded. As a result the EAL uses thresholds expressed as 200 times the alarm setpoints.

~~EAL #3~~RA1.3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

~~The 10.0 mR/hr value in EAL #4 is based on a release rate not exceeding 500 mrem per year, as provided in the ODCM / RETS, prorated over 8766 hours, multiplied by 200, and rounded. (500 ÷ 8766 × 200 = 11.4). This is also the basis of the site specific value in EAL #5.~~
~~EALs #~~RA1.1 and #RA1.2 directly correlate with the IC since annual average meteorology is required to be used in showing compliance with the ~~RETS~~ ODCM specifications and is used in calculating the alarm setpoints. ~~EALs #4 and #5 are a function of actual meteorology, which will likely be different from the limiting annual average value. Thus, there will likely be a numerical inconsistency. However, t~~The fundamental basis of this IC is NOT a dose or dose rate, but rather the degradation in the level of safety of the plant implied by the uncontrolled release.~~ Exceeding EAL #4 or EAL #5 is an indication of an uncontrolled release meeting the fundamental basis for this IC.~~

Due to the uncertainty associated with meteorology, emergency implementing procedures ~~should~~ call for the timely performance of dose assessments using actual (real-time) meteorology in the event of a gaseous radioactivity release of this magnitude. The results of these assessments should be compared to the ICs ~~AS1~~ RS1 and ~~AG1~~ RG1 to determine if the event classification should be escalated. ~~Contrary to the practices specified in revision 2 of this document, classification~~ Classification should not be delayed pending the results of these dose assessments.

PINGP Basis Reference(s):

1. ODCM Section 3.0 Gaseous Effluents
2. ODCM Section 5.1 Gaseous Effluent Monitor Setpoint Determination
3. ODCM Section 2.1 Liquid Effluents
4. ODCM Section 4.1 Liquid Effluent Monitor Setpoint Determination
5. ODCM Appendix A

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

~~AA2~~RA2

Initiating Condition~~--~~ ALERT

Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (RA2.1 or RA2.2)

RA2.1. A VALID ~~(site-specific)~~ alarm or reading on one or more of the following radiation monitors:

- R-25 or R-31 SFP Air Monitor
- R-5 Fuel Handling Area Monitor reading (10 mR/hr)
- R-28 New Fuel Pool Criticality Area Monitor (10 mR/hr)
- 1(2) R-11 Ctmt/SBV Air Particulate Monitor
- 1(2) R-12 Ctmt/SBV Radio Gas Monitor
- 1(2) R-2 Containment Vessel Area Monitor (50 mR/hr)

~~(site-specific monitors)~~

~~Refuel Floor Area Radiation Monitor~~
~~Fuel Handling Building Ventilation Monitor~~
~~Refueling Bridge Area Radiation Monitor~~

RA2.2. Report of visual observation of irradiated fuel uncovered

OR

Loss of water inventory as indicated by inadequate makeup rate that will result in irradiated fuel uncovering.

~~Water level less than (site-specific) feet for the reactor refueling cavity, spent fuel pool and fuel transfer canal that will result in irradiated fuel uncovering.~~

Basis:

This IC addresses specific events that have resulted, or may result, in unexpected increases in radiation dose rates within plant buildings, and may be a precursor to a radioactivity release to the environment. These events represent a loss of control over radioactive material and represent ~~a degradation~~degradation in the level of safety of the plant. These events escalate from IC ~~AU2~~ RU2 in that fuel activity has been released, or is anticipated due to fuel heatup. This IC applies to spent fuel requiring water coverage and is not intended to address spent fuel which is licensed for dry storage, which is discussed in IC ~~E-~~AEU1.

~~EAL #1~~RA2.1 addresses radiation monitor indications [Ref. 1, 2, 3, 4-10] of fuel uncovery and/or fuel damage. Increased readings on ventilation monitors may be indication of a radioactivity release from the fuel, confirming that damage has occurred. Increased background at the monitor due to water level decrease may mask increased ventilation exhaust airborne activity and needs to be considered. While a radiation monitor could detect an increase in dose rate due to a drop in the water level, it might not be a reliable indication of whether or not the fuel is covered. For example, the monitor could in fact be properly responding to a known event involving transfer or relocation of a source, stored in or near the fuel pool or responding to a planned evolution such as removal of the reactor head. Application of these Initiating Conditions requires understanding of the actual radiological conditions present in the vicinity of the monitor. Information Notice No. 90-08, "*KR-85 Hazards from Decayed Fuel*" ~~should be~~was considered in establishing radiation monitor EAL thresholds and there is no impact on this EAL.

In ~~EAL #2~~RA2.2, since there is no level indicating system at these low levels in the Spent Fuel Pool, refueling cavity or fuel transfer canal, visual observation of loss of water level would be required. ~~site-specific~~ Other indications may include ~~instrumentation such as water level and~~ local area radiation monitors, and personnel (e.g., refueling crew) reports. If available, ~~security~~ video cameras may allow remote observation. ~~Depending on available level indication, the d~~Declaration ~~threshold~~ may need to be based on indications of water makeup ~~rate or decrease in refueling water storage tank level~~capabilities.

Escalation, if appropriate, would occur via IC ~~AS1~~ RS1 or ~~AG1~~ RG1 or Emergency Director judgment.

PINGP Basis Reference(s):

1. C16 AOP-1 Loss of SFP Inventory
2. D5.1 AOP-1 SFP Area Evacuation/Non Refueling
3. D5.2 AOP-4 SFP Area Evacuation/Refueling
4. C47047 R-25 Spent Fuel Pool Air Monitor A
5. C47048 R-31 Spent Fuel Pool Air Monitor B
6. C47048 R-5 Spent Fuel Pool Area Monitor
7. C47047 R-28 New Fuel Pool Criticality Area Monitor
8. C47047 / C47048 1(2)R-11 Containment/Shield Bldg Vent Air Particulate Monitor
9. C47047 / C47048 1(2)R-12 Containment/Shield Bldg Vent Radio Gas Monitor
10. C47047 / C47048 1(2)R-2 Containment Vessel Area Monitor

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

~~AA3~~RA3

Initiating Condition -- ALERT

Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (RA3.1 or RA3.2)

RA3.1. VALID ~~(site-specific)~~ radiation monitor readings GREATER THAN 15 mR/hr in areas requiring continuous occupancy to maintain plant safety functions:

Control Room (Rad monitor R-1)

OR

Central Alarm Station (by portable radiation monitoring instrumentation)

~~(Site-specific) list~~

RA3.2. Any VALID ~~(site-specific)~~ radiation monitor readings GREATER THAN ~~<site specific> values~~12 R/hr in areas requiring infrequent access to maintain plant safety functions (Table H-1).

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				

*Also consider areas contiguous to these

~~(Site-specific) list~~

Basis:

This IC addresses increased radiation levels that impede necessary access to operating stations, or other areas containing equipment that must be operated manually or that requires local monitoring, in order to maintain safe operation or perform a safe shutdown. It is this impaired ability to operate the plant that results in the actual or potential substantial degradation of the level of safety of the plant. The cause and/or magnitude of the increase in radiation levels is not a concern of this IC. The Emergency Director must consider the source or cause of the increased radiation levels and determine if any other IC may be involved. For example, a dose rate of 15 mR/hr in the control room may be a problem in itself. However, the increase may also be indicative of high dose rates in the containment due to a LOCA. In this latter case, an SAE or GE may be indicated by the fission product barrier matrix ICs.

~~At multiple unit sites, the example EALs could result in declaration of an Alert at one unit due to a radioactivity release or radiation shine resulting from a major accident at the other unit. This is appropriate if the increase impairs operations at the operating unit.~~

This IC is not meant to apply to increases in the containment ~~dome~~ radiation monitors as these are events which are addressed in the fission product barrier matrix ICs. Nor is it intended to apply to anticipated temporary increases due to planned events (e.g., incore detector movement, radwaste container movement, depleted resin transfers, etc.).

For RA3.1 areas requiring continuous occupancy include the Control Room, Central Alarm Station (CAS) and Secondary Alarm Station (SAS). The CAS has no installed radiation monitoring capability. The SAS is located in the Control Room Complex and monitored by area Control Room radiation monitor R-1 [Ref. 1]. ~~Areas requiring continuous occupancy includes the control room and, as appropriate to the site, any other control stations that are manned continuously, such as a radwaste control room or a central security alarm station.~~ The value of 15mR/hr is derived from the GDC 19 value of 5 rem in 30 days with adjustment for expected occupancy times. Although Section III.D.3 of NUREG-0737, *"Clarification of TMI Action Plan Requirements"*, provides that the 15 mR/hr value can be averaged over the 30 days, the value is used here without averaging, as a 30 day duration implies an event potentially more significant than an Alert.

For RA3.2 areas requiring infrequent access, the basis of the 12 R/hr value is as follows:

The PINGP annual administrative personnel exposure limit is 2 Rem/Year. 40% of the 10CFR 20 dose (2 Rem/yr) can be received by PINGP radiation workers without supervisor approval. Assuming an emergency worker is at his administrative limit, any emergency worker needing access to a plant area for the safe shutdown of the plant could receive up to an additional 3 Rem without exceeding the legal 10CFR20 annual exposure limit of 5 Rem [Ref. 4] and thus the need for emergency exposure authorization. Assuming that an activity required to be performed in the plant would, on average, require a 15 minute stay time in that area, an area exposure rate of 12 R/hr would not unduly impede access to areas necessary for safe plant shutdown.~~the site-specific value(s) should be based on radiation levels which result in~~

~~exposure control measures intended to maintain doses within normal occupational exposure guidelines and limits (i.e., 10 CFR 20), and in doing so, will impede necessary access.~~

As used here, *impede,* includes hindering or interfering provided that the interference or delay is sufficient to significantly threaten the safe operation of the plant. Table H-1 provides the list of safe shutdown areas requiring infrequent access. The listed areas contain functions and systems required for the safe shutdown of the plant. The PINGP safe shutdown analyses were consulted for equipment and plant areas required for the applicable mode [Ref 3, 4].

In-plant radiation surveys and Area Radiation Monitor (ARM) readings are methods available to assess this EAL. Radiation monitors are not specified in the EAL wording because portable monitoring devices may be used to determine area accessibility.

~~Emergency planners developing the site-specific lists may refer to the site's abnormal operating procedures, emergency operating procedures, the 10 CFR 50 Appendix R analysis, and/or, the analyses performed in response to Section 2.1.6b of NUREG-0578, *"TMI-2 Lessons Learned Task Force Status Report and Short-term Recommendations"*~~

~~, when identifying areas containing safe shutdown equipment. Do not use the dose rates postulated in the NUREG-0578 analyses as a basis for the radiation monitor readings for this IC, as the design envelope for the NUREG-0578 analyses correspond to general emergency conditions.~~

PINGP Basis Reference(s):

1. 47048 R-01 Control Room Area Monitor
2. F-2 Radiation Safety
3. USAR Section 12.2.1.1 Classification of Structures and Equipment
4. USAR Table 12.2-1 Classification of Structures, Systems and Components

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

~~AS1~~RS1

Initiating Condition -- SITE AREA EMERGENCY

Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mRem TEDE or 500 mRem Thyroid CDE for the Actual or Projected Duration of the Release.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (RS1.1 or RS1.2 or RS1.3~~-or 4~~)

Note: *If dose assessment results are available at the time of declaration, the classification should be based on ~~EAL #2~~RS1.2 instead of ~~EAL #1~~RS1.1. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated.*

RS1.1. VALID reading on one or more monitors listed in Table R-1~~-of the following radiation monitors~~ that exceeds or is expected to exceed column "SAE"~~the reading shown~~ for 15 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds				
Monitor	**GE**	**SAE**	**Alert**	**UE**
<u>Gaseous</u>				
1(2) R-50 High Range Stack Gas Monitor	3300 mR/hr	330 mR/hr	N/A	N/A
1(2) R-22* Shield Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
2R-30* & 2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
<u>Liquid</u>				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-19*SG Blowdown Radiation Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-21 Circ Water Discharge Monitor	N/A	N/A	200 X Alarm	2 X Alarm

* with Effluent discharge <u>not</u> isolated

~~(site specific list)~~

RS1.2. Dose assessment using actual meteorology indicates doses GREATER THAN 100 mRem TEDE or 500 mRem thyroid CDE at or beyond the site boundary.

~~3. A VALID reading sustained for 15 minutes or longer on perimeter radiation monitoring system greater than 100 mR/hr. [for sites having telemetered perimeter monitors]~~

~~4~~RS1.3. Field survey results indicate closed window dose rates exceeding 100 mR/hr expected to continue for more than one hour, at or beyond the site boundary;

~~or~~OR

A~~a~~nalyses of field survey samples indicate thyroid CDE of 500 mRem for one hour of inhalation, at or beyond the site boundary.

Basis:

~~*Refer to Appendix A for a detailed basis of the radiological effluent IC/EALs.*~~

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed a small fraction of the EPA Protective Action Guides (PAGs). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public. While these failures are addressed by other ICs, this IC provides appropriate diversity and addresses events which may not be able to be classified on the basis of plant status alone, e.g., fuel handling accident in spent fuel building.

The TEDE dose is set at 10% of the EPA PAG, while the 500 mRem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.

The ~~(site specific)~~Table R-1 monitor list in ~~EAL #1~~ RS1.1 ~~should~~ includes monitors on all potential release pathways [Ref. 1, 3, 4, 5, 6, 7].

The EPA PAGs are expressed in terms of the sum of the effective *dose equivalent (EDE)* and the *committed effective dose equivalent (CEDE)*, or as the thyroid *committed dose equivalent (CDE)*. For the purpose of these IC/EALs, the dose quantity *total effective dose equivalent (TEDE)*, as defined in 10 CFR 20, is used in lieu of *"...sum of EDE and CEDE...."* The EPA PAG guidance provides for the use of adult thyroid dose conversion factors. ~~However, some states have decided to calculate child thyroid CDE. Utility IC/EALs need to be consistent with those of the states involved in the facility's emergency planning zone.~~

The Table R-1 column "SAE" effluent monitor readings are derived from Reference 2. The monitor reading EALs ~~should be~~were determined by using a dose assessment method that back calculates from the dose values specified in the IC. ~~The meteorology and source term (noble gases, particulates, and halogens) used should be the same as those used for determining the monitor reading EALs in ICs AU1 and AA1. This protocol will maintain intervals between the EALs for the four classifications. Since doses are generally not monitored in real time, it is suggested that a~~

~~release duration of one hour be assumed, and that the EALs be based on a site boundary (or beyond) dose of 100 mR/hour whole body or 500 mR/hour thyroid, whichever is more limiting (as was done for EALs #3 and #4). If individual site analyses indicate a longer or shorter duration for the period in which the substantial portion of the activity is released, the longer duration should be used.~~

Since dose assessment attained in RS1.2 is based on actual meteorology, whereas the monitor reading EALs in RS1.1 are not, the results from these assessments may indicate that the classification is not warranted, or may indicate that a higher classification is warranted. For this reason, emergency implementing procedures ~~should~~ call for the timely performance of dose assessments using actual meteorology and release information. If the results of these dose assessments are available when the classification is made (e.g., initiated at a lower classification level), the dose assessment results override the monitor reading EALs.

~~Contrary to the practices specified in revision 2 of this document, classification should not be delayed pending the results of these dose assessments.~~

PINGP Basis Reference(s):

1. B-11 Radiation Monitoring System
2. Memo from Mel Agen to EAL Upgrade Project File: MIDAS Offsite Dose Calculations for R50 Readings Dated 8/14/04
3. F3-20 Determination of Radioactive Release Concentrations
4. Drawing NF-39600
5. Drawings NF-39602-1, NF-39602-2
6. Drawings NF-40762-1, NF-40762-2, NF-40762-3
7. Drawings NF-40753-1, NF-40753-2

~~AG1~~RG1

Initiating Condition – GENERAL EMERGENCY

Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (RG1.1 or RG1.2 or RG1.3~~ or 4~~)

Note: *If dose assessment results are available at the time of declaration, the classification should be based on ~~EAL #2~~RG1.2 instead of ~~EAL #1~~RG1.1. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated.*

RG1.1. VALID reading on one or more monitors listed in Table R-1~~of the following radiation monitors~~ that exceeds or expected to exceed column "GE"~~the reading shown~~ for 15 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds

Monitor	GE	SAE	Alert	UE
Gaseous				
1(2) R-50 High Range Stack Gas Monitor	3300 mR/hr	330 mR/hr	N/A	N/A
1(2) R-22* Shield Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
2R-30* & 2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
Liquid				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-19*SG Blowdown Radiation Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-21 Circ Water Discharge Monitor	N/A	N/A	200 X Alarm	2 X Alarm

* with Effluent discharge not isolated

~~site-specific list)~~

RG1.2. Dose assessment using actual meteorology indicates doses GREATER THAN 1000 mRem TEDE or 5000 mRem thyroid CDE at or beyond the site boundary.

~~3. A VALID reading sustained for 15 minutes or longer on perimeter radiation monitoring system greater than 1000 mR/hr. [for sites having telemetered perimeter monitors]~~

4RG1.3. Field survey results indicate closed window dose rates exceeding 1000 mR/hr expected to continue for more than one hour, at or beyond site boundary~~; or a~~

OR

Analyses of field survey samples indicate thyroid CDE of 5000 mRem for one hour of inhalation, at or beyond site boundary.

Basis:

~~*Refer to Appendix A for a detailed basis of the radiological effluent IC/EALs.*~~

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed the EPA Protective Action Guides (PAGs). Public protective actions will be necessary. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public and likely involve fuel damage. While these failures are addressed by other ICs, this IC provides appropriate diversity and addresses events which may not be able to be classified on the basis of plant status alone. It is important to note that, for the more severe accidents, the release may be unmonitored or there may be large uncertainties associated with the source term and/or meteorology.

The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.

The ~~(site-specific)~~Table R-1 monitor list in ~~EAL #1~~RG1.1 ~~should~~ includes monitors on all potential release pathways [Ref. 1, 3, 4, 5, 6, 7].

The EPA PAGs are expressed in terms of the sum of the effective *dose equivalent (EDE)* and the *committed effective dose equivalent (CEDE)*, or as the thyroid *committed dose equivalent (CDE).* For the purpose of these IC/EALs, the dose quantity *total effective dose equivalent (TEDE),* as defined in 10 CFR 20, is used in lieu of *"...sum of EDE and CEDE...."* The EPA PAG guidance provides for the use adult thyroid dose conversion factors. ~~However, some states have decided to calculate child thyroid CDE. Utility IC/EALs need to be consistent with those of the states involved in the facilities emergency planning zone.~~

The Table R-1 column "GE" effluent monitor readings are derived from Reference 2.
The monitor reading EALs ~~should be~~were determined by using a dose assessment method that back calculates from the dose values specified in the IC.
~~The meteorology and source term (noble gases, particulates, and halogens) used should be the same as those used for determining the monitor reading EALs in ICs AU1 and AA1. This protocol will maintain intervals between the EALs for the four classifications. Since doses are generally not monitored in real-time, it is suggested that a release duration of one hour be assumed, and that the~~

~~EALs be based on a site boundary (or beyond) dose of 1000 mR/hour whole body or 5000 mR/hour thyroid, whichever is more limiting (as was done for EALs #3 and #4). If individual site analyses indicate a longer or shorter duration for the period in which the substantial portion of the activity is released, the longer duration should be used.~~

Since dose assessment attained in RG1.2 is based on actual meteorology, whereas the monitor reading EALs in RG1.1 are not, the results from these assessments may indicate that the classification is not warranted, or may indicate that a higher classification is warranted. For this reason, emergency implementing procedures ~~should~~ call for the timely performance of dose assessments using actual meteorology and release information. If the results of these dose assessments are available when the classification is made (e.g., initiated at a lower classification level), the dose assessment results override the monitor reading EALs.

~~Contrary to the practices specified in revision 2 of this document, classification should not be delayed pending the results of these dose assessments.~~

PINGP Basis Reference(s):

1. B-11 Radiation Monitoring System
2. Memo from Mel Agen to EAL Upgrade Project File: MIDAS Offsite Dose Calculations for R50 Readings Dated 8/14/04
3. F3-20 Determination of Radioactive Release Concentrations
4. Drawing NF-39600
5. Drawings NF-39602-1, NF-39602-2
6. Drawings NF-40762-1, NF-40762-2, NF-40762-3
7. Drawings NF-40753-1, NF-40753-2

SYSTEM MALFUNCTION

CA1

Initiating Condition -- ALERT

Loss of RCS Inventory.

Operating Mode Applicability: Cold Shutdown

~~Example Emergency Action Levels:~~Emergency Action Levels: (CA1.1 or CA1.2)

CA1.1. Loss of RCS inventory as indicated by RPV level ~~less than~~at 0 inches Refueling Canal/RCS Narrow Range/Ultrasonic (at or LESS THAN 75% RVLIS Full Range) ~~{site-specific level}.~~

~~(low-low ECCS actuation setpoint) (BWR)~~

~~(bottom ID of the RCS loop) (PWR)~~

CA1.2. ~~a.~~ Loss of RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms~~{site-specific} sump and tank level increase~~

AND

~~b.~~ RCS level cannot be monitored for ~~>~~GREATER THAN 15 minutes

Basis:

These ~~example~~ EALs serve as precursors to a loss of ability to adequately cool the fuel. The magnitude of this loss of water indicates that makeup systems have not been effective and may not be capable of preventing further RPV level decrease and potential core uncovery. The 0 inches Refueling Canal, /RCS Narrow Range, and Ultrasonic level (at or less than 75% RVLIS Full Range) threshold corresponds to the bottom inside diameter of the RCS loop [Ref. 1, 2]. This condition will result in a minimum classification of Alert. ~~The BWR Low-Low ECCS Actuation Setpoint was chosen because it is a standard setpoint at which all available injection systems automatically start.~~ The ~~PWR~~ Bottom inside diameter (ID) of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost and loss of suction to decay heat removal systems has occurred. The Bottom ID of the RCS Loop Setpoint ~~should be~~is the level equal to the bottom of the RPV loop penetration (not the low point of the loop). The inability to restore and maintain level after reaching this setpoint would therefore be indicative of a failure of the RCS barrier.

The elevation of the bottom of the RCS hot leg can be monitored by:

- RCS Narrow Range (ERCS DP Train A&B): 0 inches
- RCS Ultrasonic Level (Train A&B) 0 inches
- Refueling Canal Level: 0 inches
- RVLIS Full Range: 75%

Table C-0
Recognition Category C
Cold Shutdown/Refueling System Malfunction
INITIATING CONDITION MATRIX

~~NO~~UUE	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
CU1 RCS Leakage. *Op. Mode: Cold Shutdown*	**CA1** Loss of RCS Inventory. *Op. Modes: Cold Shutdown*	**CS1** Loss of RPV Inventory Affecting Core Decay Heat Removal Capability. *Op. Modes: Cold Shutdown*	**CG1** Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV. Op. Modes: Cold Shutdown, Refueling
CU2 UNPLANNED Loss of RCS Inventory with Irradiated Fuel in the RPV *Op. Mode: Refueling*	**CA2** Loss of RPV Inventory with Irradiated Fuel in the RPV. *Op. Modes: Refueling*	**CS2** Loss of RPV Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV. Op. Modes: Refueling	
CU3 Loss of All Offsite Power to Essential Bus~~s~~es for ~~Greater Than~~GREATER THAN 15 Minutes. *Op. Modes: Cold Shutdown, Refueling*	**CA3** Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Bus~~s~~es. *Op. Modes: Cold Shutdown, Refueling, Defueled*		
CU4 UNPLANNED Loss of Decay Heat Removal Capability with Irradiated Fuel in the RPV. *OP. Modes: Cold Shutdown, Refueling*	**CA4** Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV. *Op. Modes: Cold Shutdown, Refueling*		
CU5 Fuel Clad Degradation. *Op. Modes: Cold Shutdown, Refueling*			
CU6 UNPLANNED Loss of All Onsite or Offsite Communications Capabilities. *Op. Modes: Cold Shutdown, Refueling*			
CU7 UNPLANNED Loss of Required DC Power for GREATER THAN~~Greater than~~ 15 Minutes. *Op. Modes: Cold Shutdown, Refueling*			

CU8 Inadvertent Criticality.
Op Modes:, Cold Shutdown, Refueling

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SYSTEM MALFUNCTION

CU1

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

RCS Leakage.

Operating Mode Applicability: Cold Shutdown

~~Example~~ Emergency Action Levels: (CU1.1 or CU1.2)

CU1.1. Unidentified or pressure boundary leakage GREATER THAN ~~greater than~~ 10 gpm.

CU1.2. Identified leakage GREATER THAN ~~greater than~~ 25 gpm.

Basis:

This IC is included as a ~~NOUE~~ UE because it is considered to be a potential degradation of the level of safety of the plant. The 10 gpm value for the unidentified and pressure boundary leakage was selected as it is sufficiently large to be observable via normally installed instrumentation (e.g., Pressurizer level, RCS loop level instrumentation, etc.) or reduced inventory instrumentation such as level hose indication. Lesser values must generally be determined through time-consuming surveillance tests (e.g., mass balances).

The EAL for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage. Prolonged loss of RCS Inventory may result in escalation to the Alert level via either IC CA1 (Loss of RCS Inventory with Irradiated Fuel in the RPV) or CA4 (Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV).

The difference between CU1 and CU2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and RCS inventory and level monitoring means such as Pressurizer level indication and makeup volume control tank levels are normally available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

~~**Expanded basis for these assumptions is provided in Appendix C.**~~

PINGP Basis Reference(s):

None

SYSTEM MALFUNCTION

CU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of RCS Inventory with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling

~~Example Emergency Action Levels:~~Emergency Action Levels: (CU2.1 or CU2.2)

CU2.1. UNPLANNED RCS level decrease~~-~~ below the RPV flange for ~~>~~GREATER THAN OR EQUAL TO 15 minutes

CU2.2. ~~a.~~ Loss of RPV- inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms
~~{site-specific} sump and tank level increase~~

AND

~~b.~~ RPV level cannot be monitored

Basis:

This IC is included as an ~~NOUE~~ UE because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. Refueling evolutions that decrease RCS water level below the RPV flange are carefully planned and procedurally controlled. An UNPLANNED event that results in water level decreasing below the RPV flange warrants declaration of an ~~NO~~UE due to the reduced RCS inventory that is available to keep the core covered. The allowance of 15 minutes was chosen because it is reasonable to assume that level can be restored within this time frame using one or more of the redundant means of refill that should be available. If level cannot be restored in this time frame then it may indicate a more serious condition exists. Continued loss of RCS Inventory will result in escalation to the Alert level via either IC CA2 (Loss of RPV Inventory with Irradiated Fuel in the RPV) or CA4 (Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV).

The difference between CU1 and CU2 deals with the RCS conditions that exist between cold shutdown and refueling modes. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

In the refueling mode, normal means of core temperature indication and RCS level indication may not be available. Redundant means of RPV level indication will normally be installed [Ref.1, 2, & 3] (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing ~~sump~~ Containment Sump A and ~~tank~~ Waste Holdup Tank level changes. ~~Sump~~ Containment Sump A and Waste Holdup Tank~~tank~~ level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. Escalation to Alert would be via either CA2 or RCS heatup via CA4.

~~EAL 1~~CU2.1 involves a decrease in RCS level below the top of the RPV flange that continues for 15 minutes due to an UNPLANNED event.

This EAL is not applicable to decreases in flooded reactor cavity level (covered by ~~AU2 EAL1~~RU2.1) until such time as the level decreases to the level of the vessel flange. ~~For BWRs, if RPV level continues to decrease and reaches the Low-Low ECCS Actuation Setpoint then escalation to CA2 would be appropriate. For PWRs, i~~If RPV level continues to decrease and reaches the Bottom inside diameter (ID) of the RCS Loop then escalation to CA2 would be appropriate. Note that the Bottom ID of the RCS Loop Setpoint is ~~should be the level~~ equal to the bottom of the RPV loop penetration (not the low point of the loop).

~~Expanded basis for these assumptions is provided in Appendix C.~~

PINGP Basis Reference(s):

1. 1C4.1 / 2C4.1 RCS Inventory Control - Pre-Refueling
2. FIG C1-40 refueling Water Levels
3. 1D2 / 2D2 RCS Reduced Inventory Operation

SYSTEM MALFUNCTION

CU3

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Loss of All Offsite Power to Essential Bus~~s~~es for ~~Greater Tha~~REATER THAN~~n~~ 15 Minutes.

Operating Mode Applicability: Cold Shutdown
Refueling

~~Example~~ Emergency Action Level:

CU3.1. ~~a.~~ Loss of all offsite power to ~~(site-specific) transformers~~ Buses 15(25) and 16(26) for GREATER THAN~~greater than~~ 15 minutes.

AND

~~b.~~ At least ~~(site-specific)[number of~~ one emergency generator is ~~s are~~ supplying power to an emergency bus~~ses~~.

Basis:

Prolonged loss of AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete Loss of AC Power (e.g., Station Blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Safeguards Buses 15(25) and 16(26) are the Unit 1(2) 4.16KV essential/emergency buses. PINGP emergency diesel generators (EDG) D1 (5) and D2(6) are the "emergency generators".

No credit is provided for restoration of power to a non-affected unit bus. However, bus ties between buses 15 (Unit 1) and 25 (Unit 2) and between buses 16 (Unit 1) and 26 (Unit 2) are available to provide AC power to the affected unit safeguards buses from the unaffected unit and therefore PINGP takes credit for the redundant power source for this IC. However, the inability to effect the cross-tie within 15 minutes warrants declaring a UE.

~~Plants that have the capability to cross-tie AC power from a companion unit may take credit for the redundant power source in the associated EAL for this IC. Inability to effect the cross-tie within 15 minutes warrants declaring a NOUE.~~

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

SYSTEM MALFUNCTION

CU4

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of Decay Heat Removal Capability with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown
Refueling

~~Example Emergency Action Levels:~~Emergency Action Levels: (CU4.1 or CU4.2)

CU4.1. An UNPLANNED event results in RCS temperature exceeding ~~the Technical Specification cold shutdown temperature limit]~~200°F

CU4.2. Loss of all RCS temperature and RPV level indication for ~~>~~GREATER THAN 15 minutes.

Basis:

This IC is included as an ~~NOUE~~UE because it may be a precursor of more serious conditions and, as a result, is considered to be a potential degradation of the level of safety of the plant. In cold shutdown the ability to remove decay heat relies primarily on forced cooling flow. Operation of the systems that provide this forced cooling may be jeopardized due to the unlikely loss of electrical power or RCS inventory. Since the RCS usually remains intact in the cold shutdown mode a large inventory of water is available to keep the core covered. In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Entry into cold shutdown conditions may be attained within hours of operating at power. Entry into the refueling mode procedurally ~~may~~ does not occur for ~~typically 100~~ 50 hours [Ref. 3] ~~{site-specific}~~ or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). In addition, the operators should be able to monitor RCS temperature and RPV level so that escalation to the alert level via CA4 or CA1 will occur if required.

During refueling the level in the RPV will normally be maintained above the RPV flange. Refueling evolutions that decrease water level below the RPV flange are carefully planned and procedurally controlled. Loss of forced decay heat removal at reduced inventory may result in more rapid increases in RCS/RPV temperatures depending on the time since shutdown. Escalation to the Alert level is via CA4 ~~is provided should an UNPLANNED event result in RCS temperature exceeding the Technical Specification cold shutdown temperature limit for greater than 30 minutes with CONTAINMENT CLOSURE not established~~.

Unlike the cold shutdown mode, normal means of core temperature indication and RCS level indication may not be available in the refueling mode. Redundant means of RPV level indication are therefore procedurally installed to assure that the ability to monitor level will not be interrupted. However, if all level and temperature indication were to be lost in either the cold shutdown or refueling modes, ~~EAL 2~~CU4.2 would result in declaration of an ~~NOUE~~ Unusual Event if either temperature or level indication cannot be restored within 15 minutes from the loss of both means of indication. Escalation to Alert would be via CA2 based on an inventory loss or CA4 based on exceeding its temperature criteria (200°F) [Ref. 1].

RPV water level is normally monitored using the following instruments:

- RCS Narrow Range (ERCS DP Train A&B)
- RCS Ultrasonic Level (Train A&B)
- Refueling Canal Level
- RVLIS Full Range

Figure C1-40, Refueling Water Levels, provides a cross-reference table of indicated water levels and key plant elevations. [Ref. 2]

Several instruments are capable of providing indication of RCS temperature with respect to the Technical Specification cold shutdown temperature limit (200°F). However, loss of forced decay heat removal flow may render RCS loop or RHR inlet temperature instruments readings invalid.

The Emergency Director must remain attentive to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the Emergency Director, an imminent situation is at hand, the classification should be made as if the threshold has been exceeded.

~~Expanded basis for these assumptions is provided in Appendix C.~~

PINGP Basis Reference(s):

1. Technical Specifications Table 1.1-1, Modes Definition for Cold Shutdown
2. FIG C1-40 Refueling Water Levels
3. TS Bases B.3.9.2, Refueling Cavity Water Level

CU5

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Fuel Clad Degradation.

Operating Mode Applicability: Cold Shutdown
Refueling

~~Example Emergency Action Levels:~~Emergency Action Levels: (CU5.1 or CU5.2)

CU5.1. RCS Letdown Rad Monitor 1(2)R-9 or portable radiation monitoring instrumentation GREATER THAN 2.4 R/hr indicating fuel clad degradation ~~(Site-specific) radiation monitor readings indicating fuel clad degradation greater than Technical Specification allowable limits.~~

CU5.2. ~~(Site-specific)~~ C~~c~~oolant sample activity ~~value~~ GREATER THAN Technical Specification 3.4.17 allowable limits indicating fuel clad degradation ~~greater than Technical Specification allowable limits~~.

Basis:

This IC is included as a ~~NO~~UE because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems. ~~EAL #1~~CU5.1 addresses site-specific radiation monitor readings that provide indication of fuel clad integrity [Ref. 2]. ~~EAL #2~~CU5.2 addresses coolant samples exceeding coolant technical specifications for iodine spike [Ref. 1].

Letdown line radiation is detected by the Letdown Line Rad Monitor 1(2)R-9. This EAL threshold is based on a valid R-9 high alarm or portable radiation monitoring equipment indicating RCS activity is at or about the Technical Specification allowable limit [Ref.3]. If R-9 is not in service, routine coolant activity sampling will identify the condition.

Although the Technical Specification is applicable for modes 1, 2 and 3 (when average reactor coolant temperature is GREATER THAN~~≥~~ 500°F)~~)~~, it is appropriate that this EAL be applicable in cold shutdown and refueling modes, as it indicates a potential degradation in the level of safety of the plant.

PINGP Basis Reference(s):

1. Technical Specifications 3.4.17
2. USAR Section 10.2.3.3.7
3. R-9 Rad Monitors & Fuel Cladding Damage Based on USAR, October 11, 2004

CU6

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of All Onsite or Offsite Communications Capabilities.

Operating Mode Applicability: Cold Shutdown
Refueling

~~Example Emergency Action Levels:~~Emergency Action Levels: (CU6.1 or CU6.2)

CU6.1. Loss of all ~~(site-specific list)~~ Table C-1 onsite communications capability affecting the ability to perform routine operations.

Table C-1 Onsite Communications Systems
• Sound Powered Phones • Plant Paging System • Plant Telephone Network • Plant Radio System

CU6.2. Loss of all ~~(site-specific list)~~ Table C-2 offsite communications capability.

Table C-2 Offsite Communications Systems
• Plant Telephone Network • Plant Radio System (dedicated offsite channels) • ENS Network

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities. The loss of offsite communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

The availability of one method of ordinary offsite communications is sufficient to inform state and local authorities of plant problems. This EAL is intended to be used only when extraordinary means (e.g., relaying of information from radio transmissions, individuals being sent to offsite locations, etc.) are being utilized to make communications possible.

~~Site-specific list for o~~Onsite communications loss (Table C-1) ~~must~~ encompasses the loss of all means of routine communications (e.g., commercial telephones, sound powered phone systems, page party system and radios / walkie talkies).

~~Site-specific list for o~~Offsite communications loss (Table C-2) ~~must~~ encompasses the loss of all means of communications with offsite authorities. This ~~should~~ includes the ENS, commercial telephone lines, telecopy transmissions, dedicated offsite radio channels, and dedicated phone systems.

PINGP Basis Reference(s):

1. PINGP Emergency Plan, Section 7.2

SYSTEM MALFUNCTION

CU7

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of Required DC Power for ~~Greater than~~GREATER THAN 15 Minutes.

Operating Mode Applicability: Cold Shutdown
Refueling

~~Example Emergency~~Emergency Action Level:

~~1. a.~~CU7.1 -UNPLANNED Loss of required v~~V~~ital DC power ~~to required DC busses~~ based on ~~(site-specific) bus voltage indications~~ LESS THAN 112 VDC on 125 VDC Panels 11(21) and 12(22)~~.~~

AND

~~b.~~Failure to restore power to at least one required DC ~~bus~~ panel within 15 minutes from the time of loss.

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of DC power compromising the ability to monitor and control the removal of decay heat during Cold Shutdown or Refueling operations. This EAL is intended to be anticipatory in as much as the operating crew may not have necessary indication and control of equipment needed to respond to the loss.

UNPLANNED is included in this IC and EAL to preclude the declaration of an emergency as a result of planned maintenance activities. Routinely plants will perform maintenance on a Train related basis during shutdown periods. It is intended that the loss of the operating (operable) train is to be considered. If this loss results in the inability to maintain cold shutdown, the escalation to an Alert will be per CA4 "Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV."

~~(Site-specific)~~LESS THAN 112 VDC bus voltage ~~should be~~is based on the minimum bus voltage necessary for the operation of safety related equipment [Ref. 1, 2, 9]. This voltage value ~~should~~ incorporates a margin of at least .5 volts ~~15 minutes~~ of operation before the onset of inability to operate those loads. ~~This voltage is usually near the minimum voltage selected when battery sizing is performed. Typically the value for the entire battery set is approximately 105 VDC. For a 60 cell string of batteries the cell voltage 1.75 Volts per cell. For a 58 string battery set the minimum voltage is typically 1.81 Volts per cell.~~

PINGP uses "Panel" rather than "Bus" for the 125 VDC system. 125 VDC Panels 11 and 12 serve Unit 1 and 125 VDC Panels 21 and 22 serve Unit 2.

Each of the two station batteries per Unit has been sized to carry expected shutdown loads following a plant trip, and a loss of AC battery charging power for a period of 1 hour without battery terminal voltage falling below the minimum required voltage. Depending on which DC bus, the minimum required voltage ranges from approximately 109.5 to 111.5 VDC, based on site specific calculations to assure that the needed load voltage of is available. [Ref. 9]. The LESS THAN 112 VDC value was chosen as a limiting value encompassing the four DC busses and incorporates a minimum margin of .5 VDC. Each of the four battery chargers has been sized to recharge its associated partially discharged battery within 24 hours, while carrying its normal load.

PINGP Basis Reference(s):

1. USAR Section 8.5
2. USAR Figure 8.5-1A & 8.5-1B
3. USAR Figure 8.5-2A & 8.5-2B
4. Technical Specifications 3.8.9
5. 1C20.9 AOP1 Loss of Unit 1 Train "A" DC
6. 1C20.9 AOP2 Loss of Unit 1 Train "B" DC
7. 2C20.9 AOP1 Loss of Unit 2 Train "A" DC
8. 2C20.9 AOP2 Loss of Unit 2 Train "B" DC
9. Engineering Calculations 91-02-11 Rev 0, 91-02-12 Rev 1, 91-02-21 Rev 0, 91-02-22 Rev 0

SYSTEM MALFUNCTION

CU8

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Inadvertent Criticality.

Operating Mode Applicability: Cold Shutdown
Refueling

~~Example Emergency Action Levels:~~Emergency Action Level: ~~(1 or 2)~~

~~1. An UNPLANNED extended positive period observed on nuclear instrumentation~~

CU8.~~2~~1. An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

Basis:

This IC addresses criticality events that occur in Cold Shutdown or Refueling modes (NUREG 1449, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States) such as fuel mis-loading events and inadvertent dilution events. This IC indicates a potential degradation of the level of safety of the plant, warranting an ~~NOUE~~ Unusual Event classification. This IC excludes inadvertent criticalities that occur during planned reactivity changes associated with reactor startups (e.g., criticality earlier than estimated) which are addressed in the companion IC SU8.

This condition can be identified using ~~period monitors/~~startup rate monitor. The term~~s~~ ~~"extended" and~~ "sustained" ~~are~~ is used in order to allow exclusion of expected short term positive ~~periods/~~startup rates from planned fuel bundle or control rod movements during core alteration ~~for PWRs and BWRs~~. These short term positive ~~periods/~~startup rates are the result of the ~~increase~~rise in neutron population due to subcritical multiplication.

This condition can be identified using source range monitors 1(2)N-31 and 1(2)N-32, NIS recorder NR-45, audible count rate monitor 1(2)N34A, and the shutdown monitor.

Escalation would be by Emergency Director Judgment.

Figure C1-40, Refueling Water Levels, provides a cross-reference table of indicated water levels and key plant elevations. [Refs. 1, 2].

In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Entry into cold shutdown conditions may be attained within hours of operating at power or hours after refueling is completed. Entry into the refueling mode procedurally ~~may~~ does not occur for ~~typically 100~~50 hours [Ref. 3]~~{site specific}~~ or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). The above forms the basis for needing both a cold shutdown specific IC (CA1) and a refueling specific IC (CA2).

In the cold shutdown mode, normal RCS level and RPV level instrumentation systems will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Containment Sump A receives all liquid waste from floor and equipment drains inside containment including that from Refueling Cavity Sump C. Sump C receives any leakage from immediately around the reactor vessel. Since neither of these sumps has level indication, abnormal leakage must be detected via sump high level alarms, or increase in sump pump run times [Ref. 4]. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. The 15-minute duration for the loss of level indication was chosen because it is half of the CS1 Site Area Emergency EAL duration. The 15-minute duration allows CA1 to be an effective precursor to CS1. Significant fuel damage is not expected to occur until the core has been uncovered for greater than 1 hour per the analysis referenced in the CS1 basis. Therefore this EAL meets the definition for an Alert emergency.

The difference between CA1 and CA2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

If RPV level continues to decrease then escalation to Site Area will be via CS1 (Loss of Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV).

~~Expanded basis for these assumptions is provided in Appendix C.~~

PINGP Basis Reference(s):

1. Reactor Vessel Level (RVLSI Full Range), October 19, 2004
2. FIG C1-40 refueling Water Levels
3. TS Bases B.3.9.2, Refueling Cavity Water Level
4. NF-39248, Flow Diagram – Aux & Rx Bldg Floor & Equipment Drain System

SYSTEM MALFUNCTION

CA2

Initiating Condition – ALERT

Loss of RPV Inventory with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling

~~Example Emergency Action Levels:~~Emergency Action Levels: (CA2.1 or CA2.2)

CA2.1. Loss of RPV inventory as indicated by RPV level at 0 inches Refueling Canal/RCS Narrow Range/Ultrasonic

CA2.2. ~~a.~~ Loss of ~~RPV~~ RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms~~{site-specific} sump and tank level increase~~

AND

~~b.~~ RPV level cannot be monitored for ~~>~~GREATER THAN 15 minutes

Basis:

These example EALs serve as precursors to a loss of heat removal. The magnitude of this loss of water indicates that makeup systems have not been effective and may not be capable of preventing further RPV level decrease and potential core uncovery. The 0 inches Refueling Canal, RCS Narrow Range, and Ultrasonic level indication threshold corresponds to the bottom inside diameter (ID) of the RCS loop [Ref. 2]. This condition will result in a minimum classification of Alert. ~~The BWR Low Low ECCS Actuation Setpoint was chosen because it is a standard setpoint at which all available injection systems automatically start.~~ The Bottom ID of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost and loss of suction to decay heat removal systems may occur. The Bottom ID of the RCS Loop Setpoint ~~should be~~is the level equal to the bottom of the RPV loop penetration (not the low point of the loop). The inability to restore and maintain level after reaching this setpoint would therefore be indicative of a failure of the RCS barrier.

The elevation of the bottom of the RCS hot leg can be monitored by:

- RCS Narrow Range (ERCS DP Train A&B): 0 inches
- RCS Ultrasonic Level (Train A&B): 0 inches
- Refueling Canal Level: 0 inches

Figure C1-40, Refueling Water Levels, provides a cross-reference table of indicated water levels and key plant elevations.

[Ref. 2]

In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Entry into cold shutdown conditions may be attained within hours of operating at power or hours after refueling is completed. Entry into the refueling mode procedurally ~~may~~ does not occur for ~~typically 100~~ 50 hours [Ref. 1]~~{site specific}~~ or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). The above forms the basis for needing both a cold shutdown specific IC (CA1) and a refueling specific IC (CA2).

In the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will be normally installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Containment Sump A receives all liquid waste from floor and equipment drains inside containment including that from Refueling Cavity Sump C. Sump C receives any leakage from immediately around the reactor vessel. Since neither of these sumps has level indication, abnormal leakage must be detected via sump high level alarms, or increased sump pump run times. [Ref. 3] Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. The 15-minute duration for the loss of level indication was chosen because it is half of the CS2 Site Area Emergency EAL duration. The 15-minute duration allows CA2 to be an effective precursor to CS2. Significant fuel damage is not expected to occur until the core has been uncovered for greater than 1 hour per the analysis referenced in the CS2 basis. Therefore this EAL meets the definition for an Alert.

The difference between CA1 and CA2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

If RPV level continues to decrease then escalation to Site Area will be via CS1 (Loss of Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV).

~~**Expanded basis for these assumptions is provided in Appendix C.**~~

PINGP Basis Reference(s):

1. TS Bases B.3.9.2, Refueling Cavity Water Level
2. FIG C1-40 refueling Water Levels
3. NF-39248, Flow Diagram – Aux & Rx Bldg Floor & Equipment Drain System

SYSTEM MALFUNCTION

CA3

Initiating Condition – ALERT

Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses.

Operating Mode Applicability: Cold Shutdown
Refueling
Defueled

~~Example Emergency~~Emergency Action Level:

CA3.1. ~~a.~~ Loss of all offsite power to Buses 15(25) and 16(26)

~~power to (site-specific) transformers.~~

AND

~~b.~~ Failure of ~~(site-specific)~~all emergency generators to supply power to emergency Buses 15(25) and 16(26)~~busses~~.

AND

~~c.~~ Failure to restore power to at least one emergency bus within 15 minutes from the time of loss of both offsite and onsite AC power.

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal, Spent Fuel Heat Removal and the Ultimate Heat Sink. When in cold shutdown, refueling, or defueled mode the event can be classified as an Alert, because of the significantly reduced decay heat, lower temperature and pressure, increasing the time to restore one of the emergency busses, relative to that specified for the Site Area Emergency EAL. Escalating to Site Area Emergency IC SS1, if appropriate, is by Abnormal Rad Levels / Radiological Effluent, or Emergency Director Judgment ICs. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This EAL is indicated by the loss of all offsite and onsite AC power to the 4.16KV Safeguards buses. Safeguards Buses 15(25) and 16(26) are the Unit 1(2) 4.16KV essential/emergency buses. PINGP emergency diesel generators (EDG) D1 (5) and D2(6) are the "emergency generators". No credit is provided for restoration of power to a non-affected unit bus. However, bus ties between buses 15 (Unit 1) and 25 (Unit 2) and between buses 16 (Unit 1) and 26 (Unit 2) are available to provide AC power to the affected from the non-affected unit.

Consideration should be given to operable loads necessary to remove decay heat or provide Reactor Vessel makeup capability when evaluating loss of AC power to essential busses. Even though an essential bus may be energized, if necessary loads (i.e., loads that if lost would inhibit decay heat removal capability or Reactor Vessel makeup capability) are not operable on the energized bus then the bus ~~should~~ is not be considered operable.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

CA4

Initiating Condition – ALERT

Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown
Refueling

~~Example Emergency Action Levels:~~Emergency Action Levels: (EAL CA4.1 or CA4.2 or CA4.3)

CA4.1. With CONTAINMENT CLOSURE and RCS integrity not established an UNPLANNED event results in RCS temperature exceeding ~~the Technical Specification cold shutdown temperature limit~~200 degrees F.

CA4.2. With CONTAINMENT CLOSURE established and RCS integrity not established or RCS inventory reduced an UNPLANNED event results in RCS temperature exceeding ~~the Technical Specification cold shutdown temperature limit~~200 degrees F for ~~greater than~~GREATER THAN 20 minutes[1].

CA4.3. An UNPLANNED event results in RCS temperature exceeding ~~the Technical Specification cold shutdown temperature limit~~200 degrees F for GREATER THAN~~greater than~~ 60 minutes[1] or results in an RCS pressure increase of GREATER THAN~~greater than {site specific}~~ 25 psig.

Basis:

~~EAL 1~~CA4.1 addresses complete loss of functions required for core cooling during refueling and cold shutdown modes when neither CONTAINMENT CLOSURE nor RCS integrity are established. RCS integrity is in place when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). No delay time is allowed for ~~EAL1~~ CA4.1 because the evaporated reactor coolant that may be released into the Containment during this heatup condition could also be directly released to the environment.

~~EAL 2~~CA4.2 addresses the complete loss of functions required for core cooling for ~~>~~GREATER THAN 20 minutes during refueling and cold shutdown modes when CONTAINMENT CLOSURE is established but RCS integrity is not established or RCS inventory is reduced (e.g., mid loop operation~~ in PWRs~~). As in ~~EAL 1~~CA4.1, RCS integrity should be assumed to be in place when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). The allowed 20 minute time frame was included to allow operator action to restore the heat removal function, if possible. The allowed time frame is consistent with the guidance provided by Generic Letter 88-17, "Loss of Decay Heat Removal" (discussed later in this basis) and is believed to be conservative given that a low pressure Containment barrier to fission product release is established. Note 1 indicates that ~~EAL 2~~CA4.2 is not applicable if

[1]Note: if an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced then this EAL is not applicable.

actions are successful in restoring an RCS heat removal system to operation and RCS temperature is being reduced within the 20 minute time frame.

~~EAL 3~~CA4.3 addresses complete loss of functions required for core cooling for ~~>~~GREATER THAN 60 minutes during refueling and cold shutdown modes when RCS integrity is established. As in ~~EAL 1~~CA4.1 and ~~2~~CA4.2, RCS integrity should be considered to be in place when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). The status of CONTAINMENT CLOSURE in this EAL is immaterial given that the RCS is providing a high pressure barrier to fission product release to the environment. The 60 minute time frame ~~should~~ allows sufficient time to restore cooling without ~~there being~~ a substantial degradation in plant safety. The ~~{site specific}~~25 psig pressure increase covers situations where, due to high decay heat loads, the time provided to restore temperature control, should be less than 60 minutes. The 25 psig RCS pressure setpoint ~~chosen should be 10 psig or~~is the lowest pressure that ~~the site~~Operations can read on PR-42043 [PR-42616], RCS PRESSURE (installed Control Board instrumentation). ~~that is equal to or greater than 10 psig.~~ Note 1 indicates that ~~EAL 3~~CA4.3 is not applicable if actions are successful in restoring an RCS heat removal system to operation and RCS temperature is being reduced within the 60 minute time frame assuming that the RCS pressure increase has remained less than the site specific pressure value.

Several instruments are capable of providing indication of RCS temperature with respect to the Technical Specification cold shutdown temperature limit (200°F) [Ref. 1]. However, l~~L~~oss of forced decay heat removal flow may ~~then~~ render RCS loop or RHR inlet temperature instruments readings invalid.

Escalation to Site Area would be via CS1 or CS2 should boiling result in significant RPV level loss leading to core uncovery.

~~For PWRs, t~~This IC and its associated EALs are based on concerns raised by Generic Letter 88-17, "Loss of Decay Heat Removal." A number of phenomena such as pressurization, vortexing, steam generator U-tube draining, RCS level differences when operating at a mid-loop condition, decay heat removal system design, and level instrumentation problems can lead to conditions where decay heat removal is lost and core uncovery can occur. NRC analyses show that sequences that can cause core uncovery in 15 to 20 minutes and severe core damage within an hour after decay heat removal is lost.

A loss of Technical Specification components alone is not intended to constitute an Alert. The same is true of a momentary UNPLANNED excursion above 200 degrees F when the heat removal function is available.

The Emergency Director must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the Emergency Director, an imminent situation is at hand, the classification should be made as if the threshold has been exceeded.

~~**Expanded basis for these assumptions is provided in Appendix C.**~~

PINGP Basis Reference(s):

1. Technical Specifications Table 1.1-1, Modes Definition for Cold Shutdown

Initiating Condition -- SITE AREA EMERGENCY

Loss of RPV Inventory Affecting Core Decay Heat Removal Capability.

Operating Mode Applicability: Cold Shutdown

~~Example Emergency Action Levels:~~Emergency Action Levels: (CS1.1 or CS1.2)

CS1.1. With CONTAINMENT CLOSURE not established:

a. RPV inventory as indicated by RPV level ~~less than~~LESS THAN 73% RVLIS Full Range~~{site-specific level}~~

OR

b. RPV level cannot be monitored for ~~>~~GREATER THAN 30 minutes with a loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms~~{site-specific} sump and tank level increase~~

CS1.2. With CONTAINMENT CLOSURE established

a. RPV inventory as indicated by RPV level ~~less than~~LESS THAN 63% RVLIS Full Range

OR

b. RPV level cannot be monitored for ~~>~~GREATER THAN 30 minutes with a loss of RPV inventory as indicated by either:
   - Unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms ~~{site specific} sump and tank level increase~~
   - Erratic Source Range Monitor Indication

Basis:

Under the conditions specified by this IC, continued decrease in RPV level is indicative of a loss of inventory control. Inventory loss may be due to an RPV breach, pressure boundary leakage, or continued boiling in the RPV. In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Entry into cold shutdown conditions may be attained within hours of operating at power or hours after refueling is completed. Entry into the refueling mode procedurally ~~may~~ does not occur for ~~typically 100~~ 50 hours [Ref. 3]~~{site-specific}~~ or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). The above forms the basis for needing both a cold shutdown specific IC (CS1) and a refueling specific IC (CS2).

In the cold shutdown mode, normal RCS level and reactor vessel level indication systems (RVLIS) will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Containment Sump A receives all liquid waste from floor and equipment drains inside containment. Sump C receives any leakage from immediately around the reactor vessel. Since neither of these sumps has level indication, abnormal leakage must be detected via sump high level alarms, or increased sump pump run times [Ref. 4.] Containment Sump A is equipped with a high level alarm. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

These ~~example~~ EALs are based on concerns raised by Generic Letter 88-17, *Loss of Decay Heat Removal*, SECY 91-283, *Evaluation of Shutdown and Low Power Risk Issues*, NUREG-1449, *Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States*, and, NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management.* A number of variables, ~~(BWRs - e.g., such as initial vessel level, or shutdown heat removal system design)~~ (PWRs - e.g., mid-loop, reduced level/flange level, head in place, or cavity flooded, RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining) can have a significant impact on heat removal capability challenging the fuel clad barrier. Analysis in the above references indicates that core damage may occur within an hour following continued core uncovery therefore, conservatively, 30-minutes was chosen.

When RPV water level drops to 73% RVLIS full range, the level associated without CONTAINMENT CLOSURE established, is approximately six inches below the bottom of the RCS hot leg vessel penetration. This level can only be remotely monitored by RVLIS Full Range; RCS Narrow Range (ERCS DP Train A & B) and Refueling Canal Level instruments are offscale low for any water level below the elevation of the RCS hot leg.

When RPV water level drops to 63% RVLIS full range, the level associated with CONTAINMENT CLOSURE established, core uncovery is about to occur. RVLIS Full Range indication of 55% is approximately the top of active fuel [Ref. 1, 2].

~~If a PWRs RVLIS is unable to distinguish 6" below the bottom ID of the RCS loop penetration, then the first observable point below the bottom ID of the loop should be chosen as the setpoint.~~ If a RVLIS is not available such that the ~~PWR~~ RPV ~~EAL setpoint~~level cannot be determined, then EAL CS1.b should be used to determine if the IC has been met. The 30-minute duration allowed when CONTAINMENT CLOSURE is established allows sufficient time for actions to be performed to recover needed cooling equipment and is considered to be conservative given that level is being monitored via CS1 and CS2. ~~For PWRs the E~~effluent release is not expected with closure established.
~~For BWRs releases would be monitored and escalation would be via Category A ICs if required.~~

Thus, ~~for both PWR and BWR~~ declaration of a Site Area Emergency is warranted under the conditions specified by the IC. Escalation to a General Emergency is via CG1 (Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV) or radiological effluent IC ~~AG1~~ RG1 (Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology).

~~**Expanded basis for these assumptions is provided in Appendix C.**~~

PINGP Basis Reference(s):

1. Reactor Vessel Level (RVLSI Full Range), October 19, 2004
2. FIG C1-40 refueling Water Levels
3. TS Bases B.3.9.2, Refueling Cavity Water Level
4. NF-39248, Flow Diagram –Aux & Rx Bldg Floor & Equipment Drain Systems

SYSTEM MALFUNCTION

CS2

Initiating Condition -- SITE AREA EMERGENCY

Loss of RPV Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling

~~Example Emergency Action Levels:~~Emergency Action Levels: (CS2.1 or CS2.2)

CS2.1. With CONTAINMENT CLOSURE not established~~:~~

~~a. RPV inventory as indicated by RPV level less thanLESS THAN 68% RVLIS Full Range{site-specific level}~~

~~OR~~

~~Eb.~~and RPV level cannot be monitored, with ~~I~~indication of core uncovery as evidenced by one or more of the following:

- Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN 5 R/hr
- Erratic Source Range Monitor Indication
  ~~Other {site-specific} indications~~

CS2.2. With CONTAINMENT CLOSURE established,

~~a. RPV inventory as indicated by RPV level less thanLESS THAN 63% RVLIS Full RangeTOAF~~

~~OR~~

~~b.~~ and RPV level cannot be monitored, with ~~I~~indication of core uncovery as evidenced by one or more of the following:

- Containment High Range Radiation Monitor (R48 or R49) reading ~~>~~GREATER THAN ~~{site-specific} setpoint~~ 5 R/hr
- Erratic Source Range Monitor Indication
  ~~Other {site-specific} indications~~

Basis:

This IC should not be used for classification unless RPV level is below the bottom inside diameter (ID) of the RCS hot leg penetration. At this point, RPV level indication is no longer available in the Refueling mode. If level is at or above the Bottom ID, CU2 or CA2 should be used for event classification in the Refueling mode.

Under the conditions specified by this IC, continued decrease in RPV level is indicative of a loss of inventory control. Inventory loss may be due to an RPV breach or continued boiling in the RPV.

~~Since BWRs have RCS penetrations below the setpoint, continued level decrease may be indicative of pressure boundary leakage.~~

In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode Entry into cold shutdown conditions may be attained within hours of operating at power or hours after refueling is completed. Entry into the refueling mode procedurally ~~may~~ does not occur for ~~typically 100~~50 hours [Ref. 1] ~~{site specific}~~ or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). The above forms the basis for needing both a cold shutdown specific IC (CS1) and a refueling specific IC (CS2).

These ~~example~~ EALs are based on concerns raised by Generic Letter 88-17, *Loss of Decay Heat* Removal, SECY 91-283, *Evaluation of Shutdown and Low Power Risk Issues*, NUREG-1449, *Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States*~~.~~, and, NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management.* A number of variables, ~~(BWRs – e.g., such as initial vessel level, or shutdown heat removal system design) (PWRs –~~ (e.g., mid-loop, reduced level/flange level, head in place, or cavity flooded, RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining) can have a significant impact on heat removal capability challenging the fuel clad barrier. Analysis in the above references indicates that core damage may occur within an hour following continued core uncovery. ~~therefore, conservatively, 30 minutes was chosen.~~

NEI EAL 1.a and 2.a use RPV level in classification. However, in the Refueling mode this level cannot be remotely monitored; RVLIS is out-of-service in the Refueling mode, and RCS Narrow Range (ERCS DP Train A&B), Refueling Canal, and Ultrasonic level indication is offscale low for any water level below the bottom of the RCS hot legs [Ref. 2]. Under such conditions, personnel would not be in containment for observation, and there are no remote cameras installed to monitor level under this condition. Per NEI 99-04 technical guidance, if a RVLIS is not available such that the PWR EAL setpoint cannot be determined, then EAL 1.b and 2.b. should be used to determine if the IC has been met. This results in no reference to RPV level in PINGP EAL CS2.1 and CS2.2, and, for both, the same EAL indications are used irrespective of whether CONTAINMENT CLOSURE is established or not. However, separate EALs are maintained such that the Emergency Director remains aware of the status of CONTAINMENT CLOSURE, and so this status is provided to off-site agencies via notification of event classification. Effluent release is not expected with CONTAINMENT CLOSURE established.

As water level in the RPV lowers, the dose rate above the core will increase. The dose rate due to this core shine should result in up-scaled Containment High Range Monitor indication and possible alarm. EAL 2.1 and EAL 2.2 values are based on a conservative estimate of a dose rate setpoint indicative of core uncovery (i.e. level at TOAF). Containment High Range Radiation Monitor (R48 or R49) provides an indication of core uncovery by increased radiation level indication. A setpoint of GREATER THAN 5 R/hr is based upon the lowest threshold of Operations readability for indication of an actual change from the normal reading (normally reads 1.5 to 3 R/Hr)

Post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered. Source Range Monitors, 1(2)N-31 and 1(2)N-32B, can be used as a tool for making such determinations. SRM countrate can also be indicated in the Control Room by the NIS recorder NR-45, audible count rate monitor 1(2)N34A and the shutdown monitor.

~~If a PWRs RVLIS is unable to distinguish 6" below the bottom ID of the RCS loop penetration, then the first observable point below the bottom ID of the loop should be chosen as the setpoint. If a RVLIS is not available such that the PWR EAL setpoint cannot be determined, then EAL 1.b should be used to determine if the IC has been met.~~

~~As water level in the RPV lowers, the dose rate above the core will increase. The dose rate due to this core shine should result in up-scaled Containment High Range Monitor indication and possible alarm. EAL 1.b and EAL 2.b calculations should be performed to conservatively estimate a site-specific dose rate setpoint indicative of core uncovery (ie., level at TOAF). Additionally, post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered and that this should be used as a tool for making such determinations.~~
~~For EAL 2 in the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will be normally installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted.~~

~~For PWRs the effluent release is not expected with closure established. For BWRs releases would be monitored and escalation would be via Category A ICs if required.~~

Thus, ~~for both PWR and BWR~~ declaration of a Site Area Emergency is warranted under the conditions specified by the IC. Escalation to a General Emergency is via CG1 (Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV) or radiological effluent IC ~~AG1~~ RG1 (Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology).

~~**Expanded basis for these assumptions is provided in Appendix C.**~~

PINGP Basis Reference(s):

1. TS Bases B.3.9.2, Refueling Cavity Water Level
2. FIG C1-40 refueling Water Levels

SYSTEM MALFUNCTION

CG1

Initiating Condition – GENERAL EMERGENCY

Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown
Refueling

~~Example Emergency~~Emergency Action Level: ~~(1 and 2 and 3)~~

CG1.1.

Loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms ~~{site-specific} sump and tank level increase~~

AND

~~2.~~ RPV Level:

a. LESS THAN 63% RVLIS Full Range ~~less than TOAF~~ for ~~>~~GREATER THAN 30 minutes

OR

b. cannot be monitored, with ~~i~~Indication of core uncovery for ~~>~~GREATER THAN 30 minutes as evidenced by one or more of the following:

- Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN ~~> {site-specific} setpoint~~5 R/hr
- Erratic Source Range Monitor Indication

~~Other {site-specific} indications~~

AND

~~3.~~

~~{Site specific} i~~Indication of CONTAINMENT challenged as indicated by one or more of the following:

- ~~Explosive mixture inside~~ Containment hydrogen concentration GREATER THAN OR EQUAL TO 6% ~~hydrogen in containment~~
- ~~Pressure~~ Containment pressure GREATER THAN ~~above {site specific} value~~46 psig
- CONTAINMENT CLOSURE <u>not</u> established

~~Secondary Containment radiation monitors above {site specific} value (BWR only)~~

Basis:

~~For EAL 1 i~~In the cold shutdown mode, normal RCS level and RPV level instrumentation systems will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators ~~would~~ need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

In the Refueling mode, RPV level indication via RVLIS will not be available, and no other means of level indication for classification purposes are available under this condition. Operators need to determine that RPV inventory loss is occurring by observing sump and tank level changes.

~~For EAL 1 in the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will be normally installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes.~~

For both cold shutdown and refueling modes sump and tank level increases ~~must be~~are evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

~~EAL 2~~This EAL represents the inability to restore and maintain RPV level to above the top of active fuel. Fuel damage is probable if RPV level cannot be restored, as available decay heat will cause boiling, further reducing the RPV level. When RPV water level drops to the top of active fuel, core uncovery is about to occur. RVLIS Full Range indication of 63% is approximately the top of active fuel. [Refs. 1, 2]

Th~~ese example~~is EAL~~s~~ is~~are~~ based on concerns raised by Generic Letter 88-17, *Loss of Decay Heat Removal*, SECY 91-283, *Evaluation of Shutdown and Low Power Risk Issues*, NUREG-1449, *Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States*, and, NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management.* A number of variables~~, (BWRs – e.g., such as initial vessel level, or shutdown heat removal system design) (PWRs –~~ (e.g., mid-loop, reduced level/flange level, head in place, or cavity flooded, RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining) can have a significant impact on heat removal capability challenging the fuel clad barrier. Analysis in the above references indicates that core damage may occur within an hour following continued core uncovery therefore, conservatively, 30 minutes was chosen.

If all means of level monitoring are not available, the RPV inventory loss may be detected by the SRMs. Post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered and Source Range Monitors, 1(2)N-31 and 1(2)N-32B, can be used as a tool for making such determinations. SRM countrate can also be indicated in the Control Room by the NIS recorder NR-45, audible count rate monitor 1(2)N34A and the shutdown monitor.

Containment High Range Radiation Monitor (R48 or R49) can also provide an indication of core uncovery by increased radiation level indication. A setpoint of GREATER THAN 5 R/hr is based upon the lowest threshold of Operations readability for indication of an actual change from the normal reading (normally reads 1.5 to 3 R/hr)

Containment Sump level changes may be indicative of a loss of RCS inventory. Containment Sump A receives all liquid waste from floor and equipment drains inside containment. Sump C receives any leakage from immediately around the reactor vessel. Since neither of these sumps has level indication, abnormal leakage must be detected via sump high level alarms, or increased sump pump run times. Sump level rises must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. [Ref. 3]

The GE is declared on the occurrence of the loss or imminent loss of function of all three barriers. Based on the above discussion, RCS barrier failure resulting in core uncovery for 30 minutes or more may cause fuel clad failure. With the CONTAINMENT breached or challenged then the potential for unmonitored fission product release to the environment is high. This represents a direct path for radioactive inventory to be released to the environment. This is consistent with the definition of a GE.

~~In the context of EAL 3,~~ CONTAINMENT CLOSURE is the action taken to secure containment and its associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions. CONTAINMENT CLOSURE should not be confused with refueling containment integrity as defined in technical specifications. Site shutdown contingency plans typically provide for re-establishing CONTAINMENT CLOSURE following a loss of heat removal or RCS inventory functions. If the closure is re-established prior to exceeding the temperature or level thresholds of the RCS Barrier and Fuel Clad Barrier EALs, escalation to GE would not occur.
~~The site-specific pressure at which CONTAINMENT is considered challenged may change based on the condition of the CONTAINMENT. If the Unit is in the cold shutdown mode and the CONTAINMENT is fully intact then the site-specific setpoint should be equivalent to the CONTAINMENT design pressure. This is consistent with typical owner's groups Emergency Response Procedures. If CONTAINMENT CLOSURE is established intentionally by the plant staff in preparations for inspection, maintenance, or refueling then the site-specific setpoint should be based on the site-specific pressure assumed for CONTAINMENT CLOSURE.~~
~~For BWRs, the use of secondary containment radiation monitors should provide indication of increased release that may be indicative of a challenge to secondary containment. The site-specific radiation monitor values should be based on the EOP "maximum safe values" because these values are easily recognizable and have an emergency basis.~~

In the early stages of a core uncovery event, it is unlikely that hydrogen buildup due to a core uncovery could result in an explosive mixture of dissolved gasses in CONTAINMENT. However, CONTAINMENT monitoring and/or sampling should be performed to verify this assumption and a General Emergency declared if it is determined that an explosive mixture exists. When hydrogen and oxygen concentrations reach or exceed the deflagration limits (equal to or greater than 6% hydrogen), loss of the containment barrier is possible [Ref. 5]. Two containment hydrogen monitor channels with a range of 0 -10% by volume continuously monitor the containment environment and are recorded in the Control Room.

The containment design pressure (46 psig) is well in excess of that expected from the design basis loss of coolant accident [Ref. 5].

~~Expanded basis for these assumptions is provided in Appendix C.~~

PINGP Basis Reference(s):

1. Fig. C1-40, Refueling Water Levels
2. Reactor Vessel Level (RVLIS Full Range), October 19, 2004
3. NF-39248, Flow Diagram – Aux & Rx Bldg Floor & Equipment Drain Systems
4. F-0.5 Containment
5. FR-C.1 Response to Inadequate Core Cooling

Table E-0

Recognition Category E

Events Related to ISFSI Malfunction

INITIATING CONDITION MATRIX

~~NO~~UE

E-~~H~~U1	Damage to a loaded cask CONFINEMENT BOUNDARY. *Op. Mode: Not Applicable*
E-~~H~~U2	Confirmed security event with potential loss of level of safety of the ISFSI *Op. Mode: Not Applicable*

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EVENTS RELATED TO ISFSI

~~E-H~~EU1

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Damage to a loaded cask CONFINEMENT BOUNDARY.

Operating Mode Applicability: Not applicable

~~Example Emergency~~Emergency Action Level: (EU1.1 or EU1.2 or EU1.3)

EU1.1. Natural phenomena events affecting a loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask.

- earthquake
- tornado (and tornado missile)
- flood
- lightning
- snow/ice

~~(site-specific list)~~

EU1.2. Accident conditions affecting a loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask.

- dropped cask
- tipped over cask
- cask burial
- explosion
- fire

~~(site-specific list)~~

EU1.3. Any condition in the opinion of the Emergency Director that indicates loss of loaded fuel storage cask CONFINEMENT BOUNDARY.

Basis:

A ~~NO~~UE in this IC is categorized on the basis of the occurrence of an event of sufficient magnitude that a loaded cask CONFINEMENT BOUNDARY is damaged or violated. This includes classification based on a loaded fuel storage cask CONFINEMENT BOUNDARY loss- leading to the degradation of the fuel during storage or posing an operational safety problem with respect to its removal from storage.

The CONFINEMENT BOUNDARY separates areas containing radioactive substances, spent nuclear fuel or high-level waste, and the environment. For the events of concern here, the critical determination is whether the external phenomena or accident has resulted in damage to the loaded fuel cask CONFINEMENT BOUNDARY.

The full CONFINEMENT BOUNDARY is not directly accessible for visible inspection, but would only be affected through an external damage mechanism. Damage of such significance is assessed or inferred through inspection of the cask(s) for VISIBLE DAMAGE.

For EAL #1.1 and EAL #1.2, the results of the ISFSI Safety Analysis Report (SAR) ~~per NUREG 1536 or SAR referenced in the cask('s) Certificate of Compliance and the related NRC Safety Evaluation Report should be~~was used to develop the site-specific list of natural phenomena events and accident conditions. These EALs ~~would~~ address responses to a dropped cask, a tipped over cask, explosion, missile damage, fire damage or natural phenomena affecting a cask (e.g., seismic event, tornado, etc.).

For ~~EAL #~~U1.3, 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 ISFSI. Emergency Director judgment is to be based on known conditions and the expected response to mitigating activities within a short time period.

PINGP Basis Reference(s):

1. Prairie Island Independent Spent Fuel Storage Installation Safety Analysis Report, Rev. 9. (Section 3.2)

~~E-H~~EU2

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

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

Operating Mode Applicability: Not applicable

~~Example Emergency Action Levels:~~Emergency Action Level:

EU2.1. Security Contingency Event as determined from PINGP ~~(site-specific)~~ Security Plan and reported by the PINGP ~~(site-specific)~~ security shift supervision.

Basis:

This EAL is based on PINGP ~~(site-specific)~~ Security Plans. Security Contingency Events are those that are applicable to this EAL. Security events which do not represent a potential degradation in the level of safety of the ISFSI, are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72.

Reference is made to ~~(site-specific)~~ PINGP security shift supervision because these individuals are the designated personnel qualified and trained to confirm that a security event is occurring or has occurred [Ref. 1]. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the Security Plan.

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)

Table ~~5~~-F-~~1~~0

Recognition Category F

Fission Product Barrier Degradation

INITIATING CONDITION MATRIX

~~See Table 3 for BWR Example EALs~~
~~See Table 4 for PWR Example EALs~~

N~~O~~UE		ALERT		SITE AREA EMERGENCY		GENERAL EMERGENCY	
FU1	ANY Loss or ANY Potential Loss of Containment *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	FA1	ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	FS1	Loss or Potential Loss of ANY Two Barriers *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	FG1	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*

NOTES

1. The logic used for these initiating conditions reflects the following considerations:

   - The Fuel Clad Barrier and the RCS Barrier are weighted more heavily than the Containment Barrier~~ (See Sections 3.4 and 3.8)~~. N~~O~~UE ICs associated with RCS and Fuel Clad Barriers are addressed under System Malfunction ICs.

   - At the Site Area Emergency level, there must be some ability to dynamically assess how far present conditions are from the threshold for a General Emergency. For example, if Fuel Clad and RCS Barrier "Loss" EALs existed, that, in addition to offsite dose assessments, would require continual assessments of radioactive inventory and containment integrity. Alternatively, if both Fuel Clad and RCS Barrier "Potential Loss" EALs existed, the Emergency Director would have more assurance that there was no immediate need to escalate to a General Emergency.

   - The ability to escalate to higher emergency classes as an event deteriorates must be maintained. For example, RCS leakage steadily increasing would represent an increasing risk to public health and safety.

2. Fission Product Barrier ICs must be capable of addressing event dynamics. Thus, the EAL Reference Table ~~3 and 4~~F-1 states that imminent (i.e., within 2 hours) Loss or Potential Loss should result in a classification as if the affected threshold(s) are already exceeded, particularly for the higher emergency classes.

~~TABLE 5-F-2~~

~~BWR Emergency Action Level~~
~~Fission Product Barrier Reference Table~~
~~Thresholds For LOSS or POTENTIAL LOSS of Barriers*~~

~~*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also, multiple events could occur which result in the conclusion that exceeding the loss or Potential loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.~~

~~UNUSUAL EVENT~~	~~ALERT~~	~~SITE AREA EMERGENCY~~	~~GENERAL EMERGENCY~~
~~ANY loss or ANY Potential Loss of Containment~~	~~ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS~~	~~Loss or Potential Loss of ANY two Barriers~~	~~Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier~~

~~Fuel Clad Barrier Example EALS~~		~~RCS Barrier Example EALS~~		~~Containment Barrier Example EALS~~	
~~LOSS~~	~~POTENTIAL LOSS~~	~~LOSS~~	~~POTENTIAL LOSS~~	~~LOSS~~	~~POTENTIAL LOSS~~
~~1. Primary Coolant Activity Level~~		~~1. Drywell Pressure~~		~~1. Drywell Pressure~~	
~~Coolant Activity GREATER THAN (site-specific) Value~~	~~Not Applicable~~	~~Pressure GREATER THAN (site-specific) PSIG~~	~~Not Applicable~~	~~Rapid unexplained decrease following initial increase~~ OR ~~Drywell pressure response not consistent with LOCA conditions~~	~~(Site-specific) PSIG and increasing~~ OR ~~Explosive mixture exists~~
OR		OR		OR	
~~2. Reactor Vessel Water Level~~		~~2. Reactor Vessel Water Level~~		~~2. Reactor Vessel Water Level~~	
~~Level LESS THAN (site-specific value)~~	~~Level LESS THAN (site-specific value)~~	~~Level LESS THAN (site-specific value)~~	~~Not Applicable~~	~~Not Applicable~~	~~Primary containment flooding required~~
		OR		OR	
		~~3. RCS Leak Rate~~		~~3. CNMT Isolation Failure or Bypass~~	
		~~(Site-specific) Indication of an unisolable Main Steamline Break~~	~~RCS leakage GREATER THAN 50 gpm inside the drywell~~ OR ~~Unisolable primary system leakage outside drywell as indicated by area temperature or area radiation alarm~~	~~Failure of both valves in any one line to close AND downstream pathway to the environment exists~~ OR ~~Intentional venting per EOPs~~ OR ~~Unisolable primary system leakage outside drywell as indicated by area temperature or area radiation alarm~~	~~Not applicable~~
OR		OR		OR	

~~TABLE 5-F-2~~

~~**BWR Emergency Action Level**~~

~~**Fission Product Barrier Reference Table**~~

~~**Thresholds For LOSS or POTENTIAL LOSS of Barriers***~~

~~*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also, multiple events could occur which result in the conclusion that exceeding the loss or Potential loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.~~

~~UNUSUAL EVENT~~	~~ALERT~~	~~SITE AREA EMERGENCY~~	~~GENERAL EMERGENCY~~
~~ANY loss or ANY Potential Loss of Containment~~	~~ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS~~	~~Loss or Potential Loss of ANY two Barriers~~	~~Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier~~

~~Fuel Clad Barrier Example EALS~~		~~RCS Barrier Example EALS~~		~~Containment Barrier Example EALS~~	
~~LOSS~~	~~POTENTIAL LOSS~~	~~LOSS~~	~~POTENTIAL LOSS~~	~~LOSS~~	~~POTENTIAL LOSS~~
~~3. Drywell Radiation Monitoring~~		~~4. Drywell Radiation Monitoring~~		~~4. Significant Radioactive Inventory in Containment~~	
~~Drywell Radiation monitor reading GREATER THAN (site-specific) R/hr~~	~~Not Applicable~~	~~Drywell Radiation monitor reading GREATER THAN (site-specific) R/hr~~	~~Not Applicable~~	~~Not applicable~~	~~Drywell Radiation monitor reading GREATER THAN (site-specific) R/hr~~
~~OR~~		~~OR~~		~~OR~~	
~~4. Other (Site-Specific) Indications~~		~~5. Other (Site-Specific) Indications~~		~~5. Other (site-specific) Indications~~	
~~(Site specific) as applicable~~	~~(Site specific) as applicable~~	~~(Site-specific) as applicable~~	~~(Site-specific) as applicable~~	~~(Site specific) as applicable~~	~~(Site specific) as applicable~~
~~OR~~		~~OR~~		~~OR~~	
~~5. Emergency Director Judgment~~		~~6. Emergency Director Judgment~~		~~6. Emergency Director Judgment~~	
~~Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier~~		~~Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the RCS Barrier~~		~~Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment barrier~~	

~~Basis Information For Table 5-F-2~~
~~BWR Emergency Action Level~~
~~Fission Product Barrier Reference Table~~

~~FUEL CLAD BARRIER EXAMPLE EALs:~~ ~~(1 or 2 or 3 or 4 or 5)~~

~~The Fuel Clad barrier is the zircalloy or stainless steel tubes that contain the fuel pellets.~~

~~1. Primary Coolant Activity Level~~

~~This (site-specific) value corresponds to 300 μCi/gm~~ I_{131} ~~equivalent. Assessment by the NUMARC EAL Task Force indicates that this amount of coolant activity is well above that expected for iodine spikes and corresponds to less than 5% fuel clad damage. This amount of radioactivity indicates significant clad damage and thus the Fuel Clad Barrier is considered lost. The value expressed can be either in mR/hr observed on the sample or as uCi/gm results from analysis.~~

~~There is no equivalent "Potential Loss" EAL for this item.~~

~~2. Reactor Vessel Water Level~~

~~The "Loss" EAL (site-specific) value corresponds to the level which is used in EOPs to indicate challenge of core cooling. Depending on the plant this may be top of active fuel or 2/3 coverage of active fuel. This is the minimum value to assure core cooling without further degradation of the clad. The "Potential Loss" EAL is the same as the RCS barrier "Loss" EAL #2 below and corresponds to the (site-specific) water level at the top of the active fuel. Thus, this EAL indicates a "Loss" of RCS barrier and a "Potential Loss" of the Fuel Clad Barrier. This EAL appropriately escalates the emergency class to a Site Area Emergency. If the "Loss" value is also the Top of Active Fuel, the "Potential Loss" value must be a value indicating a higher level also corresponding to a higher level indicated in the RCS barrier "Loss" EAL #2.~~

~~3. Drywell Radiation Monitoring~~

~~The (site-specific) reading is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the drywell. The reading should be calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 μCi/gm dose equivalent I-131 or the calculated concentration equivalent to the clad damage used in EAL #1 into the drywell atmosphere. Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage. This value is higher than that specified for RCS barrier Loss EAL #4. Thus, this EAL indicates a loss of both Fuel Clad barrier and RCS barrier.~~

~~Caution:~~ *~~it is important to recognize that in the event the radiation monitor is sensitive to shine from the reactor vessel or piping, spurious readings will be present and another indicator of fuel clad damage is necessary or compensated for in the threshold value.~~*

~~There is no "Potential Loss" EAL associated with this item.~~

~~4. Other (Site-Specific) Indications~~

~~This EAL is to cover other (site-specific) indications that may indicate loss or potential loss of the Fuel Clad barrier, including indications from containment air monitors or any other (site-specific) instrumentation.~~

~~5. Emergency Director Judgment~~

~~This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the Fuel Clad barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost. (See also IC SG1, "Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power", for additional information.)~~

~~**RCS BARRIER EXAMPLE EALs:** (1 or 2 or 3 or 4 or 5 or 6)~~

~~The RCS Barrier is the reactor coolant system pressure boundary and includes the reactor vessel and all reactor coolant system piping up to the isolation valves.~~

~~1. Drywell Pressure~~

~~The (site-specific) drywell pressure is based on the drywell high pressure set point which indicates a LOCA by automatically initiating the ECCS or equivalent makeup system.~~

~~There is no "Potential Loss" EAL corresponding to this item.~~

~~2. Reactor Vessel Water Level~~

~~This "Loss" EAL is the same as "Potential Loss" Fuel Clad Barrier EAL #2. The (site-specific) water level corresponds to the level which is used in EOPs to indicate challenge of core cooling. Depending on the plant this may be top of active fuel or 2/3 coverage of active fuel. This EAL appropriately escalates the emergency class to a Site Area Emergency. Thus, this EAL indicates a loss of the RCS barrier and a Potential Loss of the Fuel Clad Barrier.~~

~~There is no "Potential Loss" EAL corresponding to this item.~~

~~3. RCS Leak Rate~~

~~An unisolable MSL break is a breach of the RCS barrier. Thus, this EAL is included for consistency with the Alert emergency classification. The potential loss of RCS based on leakage is set at a level indicative of a small breach of the RCS but which is well within the makeup capability of normal and emergency high pressure systems. Core uncovery is not a significant concern for a 50 gpm leak, however, break propagation leading to significantly larger loss of inventory is possible. Many BWRs may be unable to measure an RCS leak of this size because the leak would likely increase drywell pressure above the drywell isolation set point. The system normally used to monitor leakage is typically isolated as part of the drywell isolation and is therefore unavailable. If primary system leak rate information is unavailable, other indicators of RCS leakage should be used.~~

~~Potential loss of RCS based on primary system leakage outside the drywell is determined from site-specific temperature or area radiation alarms low setpoint in the areas of the main steam line tunnel, main turbine generator, RCIC, HPCI, etc., which indicate a direct path from the RCS to areas outside primary containment. The indicators should be confirmed to be caused by RCS leakage. The area temperature or radiation low alarm setpoints are indicated for this example to~~

~~enable an Alert classification. An unisolable leak which is indicated by a high alarm setpoint escalates to a Site Area Emergency when combined with Containment Barrier EAL 3 (after a containment isolation) and a General Emergency when the Fuel Clad Barrier criteria is also exceeded.~~

~~4. Drywell Radiation Monitoring~~

~~The (site-specific) reading is a value which indicates the release of reactor coolant to the drywell. The reading should be calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with normal operating concentrations (i.e., within T/S) into the drywell atmosphere. This reading will be less than that specified for Fuel Clad Barrier EAL #3. Thus, this EAL would be indicative of a RCS leak only. If the radiation monitor reading increased to that value specified by Fuel Clad Barrier EAL #3, fuel damage would also be indicated.~~

~~However, if the site specific physical location of the drywell radiation monitor is such that radiation from a cloud of released RCS gases could not be distinguished from radiation from adjacent piping and components containing elevated reactor coolant activity, this EAL should be omitted and other site specific indications of RCS leakage substituted.~~

~~There is no "Potential Loss" EAL associated with this item.~~

~~5. Other (Site-Specific) Indications~~

~~This EAL is to cover other (site-specific) indications that may indicate loss or potential loss of the RCS barrier.~~

~~6. Emergency Director Judgment~~

~~This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the RCS barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost. (See also IC SG1, "Prolonged Loss of Offsite Power and Prolonged Loss of All Onsite AC Power", for additional information.)~~

~~PRIMARY CONTAINMENT BARRIER EXAMPLE EALs:~~ ~~(1 or 2 or 3 or 4 or 5 or 6)~~

~~The Primary Containment Barrier includes the drywell, the wetwell, their respective interconnecting paths, and other connections up to and including the outermost containment isolation valves. Containment Barrier EALs are used primarily as discriminators for escalation from an Alert to a Site Area Emergency or a General Emergency.~~

~~1. Drywell Pressure~~

~~Rapid unexplained loss of pressure (i.e., not attributable to drywell spray or condensation effects) following an initial pressure increase indicates a loss of containment integrity. Drywell pressure should increase as a result of mass and energy release into containment from a LOCA. Thus, drywell pressure not increasing under these conditions indicates a loss of containment integrity. This indicator relies on the operators recognition of an unexpected response for the condition and therefore does not have a specific value associated. The unexpected response is important because it is the indicator for a containment bypass condition. The (site-specific) PSIG for potential loss of containment is based on the containment drywell design pressure. Existence of an explosive mixture means a hydrogen and oxygen concentration of at least the lower deflagration~~

~~limit curve exists. This applies to BWRs with Mark III containments, as well as Mark I and II containment designs when they are de-inerted.~~

~~2. Reactor Vessel Water Level~~

~~The entry into the Primary Containment Flooding emergency procedure indicates reactor vessel water level can not be restored and that a core melt sequence is in progress. EOPs direct the operators to enter Containment Flooding when Reactor Vessel Level cannot be restored to greater than a Site Specific value (generally 2/3 core height) or is unknown. Entry into Containment Flooding procedures is a logical escalation in response to the inability to maintain reactor vessel level.~~

~~The conditions in this potential loss EAL represent imminent core melt sequences which, if not corrected, could lead to vessel failure and increased potential for containment failure. In conjunction with and an escalation of the level EALs in the Fuel and RCS barrier columns, this EAL will result in the declaration of a General Emergency -- loss of two barriers and the potential loss of a third. If the emergency operating procedures have been ineffective in restoring reactor vessel level above the RCS and Fuel Clad Barrier Threshold Values, there is not a "success" path and a core melt sequence is in progress. Entry into Containment flooding procedures is a logical escalation in response to the inability to maintain reactor vessel level.~~

~~Severe accident analysis (e.g., NUREG-1150) have concluded that function restoration procedures can arrest core degradation with the reactor vessel in a significant fraction of the core damage scenarios, and the likelihood of containment failure is very small in these events. Given this, it is appropriate to provide a reasonable period to allow emergency operating procedures to arrest the core melt sequence. Whether or not the procedures will be effective should be apparent within the time provided. The Emergency Director should make the declaration as soon as it is determined that the procedures have been, or will be, ineffective. There is no "loss" EAL associated with this item.~~

~~3. Containment Isolation Failure or Bypass~~

~~This EAL is intended to cover the inability to isolate the containment when containment isolation is required. In addition, the presence of area radiation or temperature alarms high setpoint indicating unisolable primary system leakage outside the drywell are covered after a containment isolation. The indicators should be confirmed to be caused by RCS leakage. Also, an intentional venting of primary containment for pressure control per EOPs to the secondary containment and/or the environment is considered a loss of containment. Containment venting for temperature or pressure when not in an accident situation should not be considered.~~

~~There is no "Potential Loss" EAL associated with this item.~~

~~4. Significant Radioactive Inventory in Containment~~

~~The (site-specific) reading is a value which indicates significant fuel damage well in excess of that required for loss of RCS and Fuel Clad. As stated in Section 3.8, a major release of radioactivity requiring offsite protective actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant. Regardless of whether containment is challenged, this amount of activity in containment, if released, could have such severe consequences that it is prudent to treat this as a potential loss of containment, such that a General Emergency declaration is warranted. NUREG-1228, "Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents," indicates that such conditions do not exist when the amount of clad damage is less than 20%. Unless there is a~~

~~(site-specific) analysis justifying a higher value, it is recommended that a radiation monitor reading corresponding to 20% fuel clad damage be specified here.~~

~~There is no "Loss" EAL associated with this item.~~

~~5. Other (Site-Specific) Indications~~

~~This EAL is to cover other (site-specific) indications that may indicate loss or potential loss of the containment barrier.~~

~~6. Emergency Director Judgment~~

~~This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the Containment barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost. (See also IC SG1, "Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power", for additional information.)~~

TABLE ~~5~~-F-41

~~PWR~~-PINGP Emergency Action Level
Fission Product Barrier Reference Table
Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the ~~loss~~ Loss or ~~potential~~ Potential ~~loss~~ Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	**ALERT**	**SITE AREA EMERGENCY**	**GENERAL EMERGENCY**
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

Fuel Clad Barrier ~~Example~~ EALS		**RCS Barrier ~~Example~~ EALS**		**Containment Barrier ~~Example~~ EALS**	
LOSS	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**
1. Critical Safety Function Status		**1. Critical Safety Function Status**		**1. Critical Safety Function Status**	
Conditions requiring entry into Core-Cooling Red	Conditions requiring entry into Core Cooling-Orange OR Conditions requiring entry into Heat Sink-Red	Not Applicable	Conditions requiring entry into RCS Integrity-Red OR Conditions requiring entry into Heat Sink-Red	Not Applicable	Conditions requiring entry into Containment-Red
OR		**OR**		**OR**	
2. Primary Coolant Activity Level		**2. RCS Leak Rate**		**2. Containment Pressure**	
Coolant Activity GREATER THAN 300 µCi/gm I-131 equivalent~~(site-specific) Value~~	Not Applicable	GREATER THAN available makeup capacity as indicated by a loss of RCS subcooling ~~(~~LESS THAN OR EQUAL TO 20 [35]* degree F~~)~~ *Adverse containment conditions are defined as a containment pressure greater than 5 psig or containment radiation level greater than 1E4 R/Hr.	Unisolable leak exceeding 60 gpm ~~the capacity of one charging pump in the normal charging mode~~	Rapid unexplained decrease following initial increase OR Containment pressure or sump level response not consistent with LOCA conditions	~~(Site-specific)~~46 PSIG and increasing OR Containment hydrogen concentration GREATER THAN OR EQUAL TO 6%~~Explosive mixture exists~~ OR Containment p~~P~~ressure ~~greater~~GREATER THAN ~~than containment depressurizat-ion actuation setpoint~~ 23 psig with ~~less than~~LESS THAN one full train of depressurization equipment operating

TABLE ~~5~~-F-41

~~PWR~~-PINGP Emergency Action Level

Fission Product Barrier Reference Table

Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the ~~loss~~ Loss or ~~potential~~ Potential ~~loss~~ Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

Fuel Clad Barrier ~~Example~~ EALS		RCS Barrier ~~Example~~ EALS		Containment Barrier ~~Example~~ EALS	
LOSS	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**
OR				**OR**	
3. Core Exit Thermocouple Readings				3. Core Exit Thermocouple Readings	
GREATER THAN 1200 degree F ~~(site specific) degree F~~	GREATER THAN ~~(site-specific)~~ 700 degree F			Not applicable	Core exit thermocouples in excess of 1200 degrees F and restoration procedures not effective within 15 minutes OR ~~; or, c~~Core exit thermocouples in excess of 700 degrees F with reactor vessel level below 40% RVLIS Full Range ~~top of active fuel~~ and restoration procedures not effective within 15 minutes

TABLE ~~5~~-F-41

~~PWR~~-PINGP Emergency Action Level

Fission Product Barrier Reference Table

Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the ~~loss~~ Loss or ~~potential~~ Potential ~~loss~~ Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

Fuel Clad Barrier ~~Example~~ EALS

LOSS	POTENTIAL LOSS
OR	
4. Reactor Vessel Water Level	
Not Applicable	Level LESS ~~than~~ THAN: ~~(site-specific) value~~ • 40% RVLIS Full Range (no RCPs) • 32% RVLIS Dynamic Head Range (1 RCP) • 62% RVLIS Dynamic Head Range (2 RCPs)
OR	
5. Containment Radiation Monitoring	
Containment rad monitor 1 (2) R-48 or 49 reading GREATER THAN ~~(site-specific)~~ 200 R/hr	Not Applicable

RCS Barrier ~~Example~~ EALS

LOSS	POTENTIAL LOSS
OR	
3. SG Tube Rupture	
SGTR that results in an ECCS (SI) Actuation	Not Applicable
OR	
4. Containment Radiation Monitoring	
Containment rad monitor 1 (2) R-48 or 49 reading GREATER THAN ~~(site-specific)~~ 7 R/hr	Not Applicable

Containment Barrier ~~Example~~ EALS

LOSS	POTENTIAL LOSS
OR	
4. SG Secondary Side Release with P-to-S Leakage	
RUPTURED S/G is also FAULTED outside of containment OR Primary-to-Secondary leakrate ~~greater than~~ GREATER THAN 10 gpm with nonisolable steam release from affected S/G to the environment	Not applicable
OR	
5. CNMT Isolation Valves Status After CNMT Isolation	
Containment isolation Valve(s) not closed AND ~~D~~downstream pathway to the environment exists after Containment Isolation	Not Applicable
OR	
6. Significant Radioactive Inventory in Containment	
Not Applicable	Containment rad monitor reading 1 (2) R-48 or 49 GREATER THAN ~~(site-specific)~~ 800 R/hr

TABLE ~~5-F-~~41

~~PWR-~~PINGP Emergency Action Level

Fission Product Barrier Reference Table

Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the ~~loss~~ Loss or ~~potential~~ Potential ~~loss~~ Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

Fuel Clad Barrier ~~Example~~ EALS		RCS Barrier ~~Example~~ EALS		Containment Barrier ~~Example~~ EALS	
LOSS	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**
OR		**OR**		**OR**	
6. Other ~~(Site-Specific)~~ Indications		5. Other ~~(Site-Specific)~~ Indications		7. Other ~~(site-specific)~~ Indications	
RCS letdown line radiation ~~(Site specific) as applicable~~ 1(2)R-9 GREATER THAN 10 R/hr	~~(Site specific) as applicable~~ Not Applicable	~~(Site-specific) as applicable~~ Not Applicable	~~(Site-specific) as applicable~~ Not Applicable	~~(Site specific) as applicable~~ Not Applicable	~~(Site specific) as applicable~~ Not Applicable
OR		**OR**		**OR**	
7. Emergency Director Judgment		6. Emergency Director Judgment		8. Emergency Director Judgment	
Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier		Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the RCS Barrier		Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment barrier	

Basis Information For Table ~~5~~-F-~~4~~1
~~PWR~~ PINGP Emergency Action Level
Fission Product Barrier Reference Table

FUEL CLAD BARRIER ~~EXAMPLE~~ EALs: (1 or 2 or 3 or 4 or 5 or 6 or 7)

The Fuel Clad Barrier is the zircalloy or stainless steel tubes that contain the fuel pellets.

1. Critical Safety Function Status

~~This EAL is for PWRs using Critical Safety Function Status Tree (CSFST) monitoring and functional restoration procedures. For more information, please refer to Section 3.9 of this report.~~ RED path indicates an extreme challenge to the safety function. ORANGE path indicates a severe challenge to the safety function.

Core Cooling - ORANGE indicates subcooling has been lost and that some clad damage may occur. Core Cooling-ORANGE path is entered if core exit TCs are less than 1200°F, RCS subcooling based on core exit TCs is less than 20°F[35°F] and either:

- No RCPs are running and either core exit TCs are less than 700°F and RVLIS full range is greater than 40%, or core exit TCs are greater than 700°F and RVLIS full range is less than 40%.
- At least one RCP is running and RVLIS Dynamic Head Range is less than 62% (2 RCPs) or 32% (1 RCP).

[Ref. 1]

Heat Sink - RED indicates the ultimate heat sink function is under extreme challenge and thus these two items (Core Cooling – ORANGE or Heat Sink – RED) indicate potential loss of the Fuel Clad Barrier. Heat Sink-Red path is entered if wide range level in both S/Gs is less than 50% and total feedwater flow to S/Gs is less than 200 gpm.

[Ref. 2]

Core Cooling - RED indicates significant superheating and core uncovery and is considered to indicate loss of the Fuel Clad Barrier. Core Cooling-RED path is entered if:

- Core exit TCs are greater than 1200°F, or
- Core exit TCs are greater than 700°F with RCS subcooling based on core exit TCs less than 20°F[35°F], RVLIS full range is less than 40% and no RCPs are running

Critical Safety Function Status Tree (CSFST) setpoints enclosed in brackets (e.g., [35°F], etc.) are used under adverse containment conditions. Adverse containment condition thresholds apply when containment pressure is greater than 5 psig or containment radiation exceeds 1E+4 R/hr.

[Ref. 1, 8]

The barrier loss/potential loss occurs when the plant parameter associated with the CSFST path is reached (not when the operator reads the CSFST in the EOP network). The phrase "Conditions requiring entry into..." is included in these thresholds to emphasize this intent.

2. Primary Coolant Activity Level

This ~~(site-specific)~~ value ~~corresponds to~~is 300 μCi/gm ~~I131~~ I-131 equivalent. Assessment by the NUMARC EAL Task Force indicates that this amount of coolant activity is well above that expected for iodine spikes and corresponds to less than 5% fuel clad damage. This amount of radioactivity indicates significant clad damage and thus the Fuel Clad Barrier is considered lost. ~~The value expressed can be either in mR/hr observed on the sample or as μCi/gm results from analysis.~~

There is no equivalent "Potential Loss" EAL for this item.

3. Core Exit Thermocouple Readings

Core Exit Thermocouple Readings are included in addition to the Critical Safety Functions to include conditions when the CSFs may not be in use (initiation after SI is blocked). ~~or plants which do not have a CSF scheme.~~

The "Loss" EAL 1200 degrees F~~(site-specific)~~ reading ~~should~~ corresponds to significant superheating of the coolant. This value ~~typically~~ corresponds to the temperature reading that indicates core cooling - RED in Fuel Clad Barrier EAL #1 which is ~~usually about~~ 1200 degrees F. [Ref.- 1]

The "Potential Loss" EAL 700 degrees F~~(site-specific)~~ reading ~~should~~ corresponds to loss of subcooling. This value ~~typically~~ corresponds to the temperature reading that indicates core cooling - ORANGE in Fuel Clad Barrier EAL #1 which is ~~usually about~~ 700 ~~to 900~~ degrees F. [Ref. 1]

4. Reactor Vessel Water Level

There is no "Loss" EAL corresponding to this item because it is better covered by the other Fuel Clad Barrier "Loss" EALs.

The ~~(site-specific)~~ RVLIS values for the "Potential Loss" EAL corresponds to the top of the active fuel under various RCP configurations (2 RCPs running, 1 RCP running, or no RCPs running).

~~For sites using CSFSTs, t~~The "Potential Loss" EAL is defined by the Core Cooling - ORANGE path ~~and indicate subcooling has been lost and that some fuel cladding damage may occur.~~ [Ref. 1, 2]~~. [Reference 1]The (site-specific) value in this EAL should be consistent with the CSFST value.~~

5. Containment Radiation Monitoring

The ~~(site-specific)~~200 R/hr reading is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the containment. [Ref. 9] The reading ~~should be~~is calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 μCi/gm dose equivalent I-131 into the containment atmosphere. [Ref. 4, 5] Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage. This value is higher than that specified for RCS barrier Loss EAL #4. Thus, this EAL indicates a loss of both the fuel clad barrier and a loss of RCS barrier.

There is no "Potential Loss" EAL associated with this item.

6. Other~~(Site-Specific)~~ Indications

The RCS Letdown Line Radiation Monitor (R-9) provides indication for this Fuel Cladding loss threshold. An R-9 reading in excess of 10 R/hr indicates damage to the Fuel Cladding barrier. [Ref. 13, 14, 15]~~This EAL is to cover other (site-specific) indications that may indicate loss or potential loss of the Fuel Clad barrier, including indications from containment air monitors or any other (site-specific) instrumentation.~~

7. Emergency Director Judgment

This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the Fuel Clad barrier is lost or potentially lost. Such a determination should include imminent barrier degradation, barrier monitoring capability and dominant accident sequences.

- Imminent barrier degradation exists if the degradation will likely occur within two hours based on a projection of current safety system performance. The term "imminent" refers to recognition of the inability to reach safety acceptance criteria before completion of all checks.

- Barrier monitoring capability is decreased if there is a loss or lack of reliable indicators. This assessment should include instrumentation operability concerns, readings from portable instrumentation and consideration of offsite monitoring results.

- Dominant accident sequences lead to degradation of all fission product barriers and likely entry to the CSFSTs. The Emergency Director should be mindful of the Loss of AC power (Station Blackout) and ATWS EALs to assure timely emergency classification declarations.

The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that must be considered in this EAL. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.~~In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost. (See also IC SG1, "Prolonged Loss or All Offsite Power and Prolonged Loss of All Onsite AC Power", for additional information.)~~

RCS BARRIER ~~EXAMPLE~~ EALs: (1 or 2 or 3 or 4 or 5 or 6)

The RCS Barrier includes the RCS primary side and its connections up to and including the pressurizer safety and relief valves, and other connections up to and including the primary isolation valves.

1. Critical Safety Function Status

~~This EAL is for PWRs using Critical Safety Function Status Tree (CSFST) monitoring and functional restoration procedures. For more information, please refer to Section 3.9 of this report.~~ RED path indicates an extreme challenge to the safety function derived from appropriate instrument readings, and these CSFs indicate a potential loss of RCS barrier.

RCS Integrity-Red path is entered if cold leg temperature decreases greater than 100°F in the last 60 minutes and RCS pressure/cold leg temperature is to the left of Limit A. The combination of these two conditions indicates the RCS barrier is under extreme challenge. [Ref. 6]

Heat Sink-Red path is entered if wide range level in both S/Gs is less than 50% and total feedwater flow to S/Gs is less than 200 gpm. The combination of these two conditions indicates the ultimate heat sink function is under extreme challenge. [Ref. 2]

The barrier potential loss occurs when the plant parameter associated with the CSFST path is reached (not when the operator reads the CSFST in the EOP network). The phrase "Conditions requiring entry into..." is included in these thresholds to emphasize this intent.

There is no "Loss" EAL associated with this item.

2. RCS Leak Rate

The "Loss" EAL addresses conditions where leakage from the RCS is greater than available inventory control capacity such that a loss of subcooling has occurred. The loss of subcooling is the fundamental indication that the inventory control systems are inadequate in maintaining RCS pressure and inventory against the mass loss through the leak.

The "Potential Loss" EAL is based on the inability to maintain normal liquid inventory within the Reactor Coolant System (RCS) by normal operation of the Chemical and Volume Control System which is considered as one ~~centrifugal~~ positive displacement variable speed charging pump discharging to the charging header. A second charging pump being required is indicative of a substantial RCS leak. 60 gpm is the nominal flow rate capacity for a charging pump. ~~For plants with low capacity charging pumps, a 50 gpm leak rate value may be used to indicate the Potential Loss.~~ [Ref. 7]

3. SG Tube Rupture

This EAL is intended to address the full spectrum of Steam Generator (SG) tube rupture events in conjunction with Containment Barrier "Loss" EAL #4 and Fuel Clad Barrier EALs. The "Loss" EAL addresses RUPTURED SG(s) for which the leakage is large enough to cause actuation of ECCS (SI). ECCS (SI) actuation is caused by:

- PRZR pressure less than 1830 psig
- Either SG pressure less than 530 psig

- Containment pressure greater than 3.5 psig

This is consistent to the RCS Barrier "Potential Loss" EAL #2. ~~For plants that have implemented W.O.G. emergency response guides, t~~This condition is described by "entry into E-3 required by EOPs". By itself, this EAL will result in the declaration of an Alert. However, if the SG is also FAULTED (i.e., two barriers failed), the declaration escalates to a Site Area Emergency per Containment Barrier "Loss" EAL #4. [Ref. 8]

There is no "Potential Loss" EAL.

4. Containment Radiation Monitoring

The ~~(site-specific)~~7 R/hr reading is a value which indicates the release of reactor coolant to the containment. The reading ~~should be~~is calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with normal operating concentrations (i.e., within ~~T/S~~Technical Specifications) into the containment atmosphere. [Ref. 4, 5] This reading ~~will be~~is less than that specified for Fuel Clad Barrier EAL #5. Thus, this EAL would be indicative of a RCS leak only. If the radiation monitor reading increased to that specified by Fuel Clad Barrier EAL #5, fuel damage would also be indicated.

~~However, if t~~The ~~site-specific~~ physical location of the containment radiation monitors is such that radiation from a cloud of released RCS gases can~~ould not~~ be distinguished from radiation from nearby piping and components containing elevated reactor coolant activity, ~~this EAL should be omitted and other site-specific indications of RCS leakage substituted~~making the use of these monitors for this EAL classification appropriate.

There is no "Potential Loss" EAL associated with this item.

5. Other~~(Site-Specific)~~ Indications

Instrumentation used for t~~T~~his EAL is consistent with that used in the RCS integrity EOP. There is no additional applicable indication to use for RCS barrier EALs. [Ref. 6] ~~to cover other (site-specific) indications that may indicate loss or potential loss of the RCS barrier, including indications from containment air monitors or any other (site-specific) instrumentation.~~

6. Emergency Director Judgment

This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the RCS barrier is lost or potentially lost. Such a determination should include imminent barrier degradation, barrier monitoring capability and dominant accident sequences.

- Imminent barrier degradation exists if the degradation will likely occur within two hours based on a projection of current safety system performance. The term "imminent" refers to recognition of the inability to reach safety acceptance criteria before completion of all checks.

- Barrier monitoring capability is decreased if there is a loss or lack of reliable indicators. This assessment should include instrumentation operability concerns, readings from portable instrumentation and consideration of offsite monitoring results.

- Dominant accident sequences lead to degradation of all fission product barriers and likely entry to the CSFSTs. The Emergency Director should be mindful of the Loss of AC power (Station Blackout) and ATWS EALs to assure timely emergency classification declarations.

The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that must be considered in this EAL. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.
~~In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost. (See also IC SG1, "Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power", for additional information.)~~

CONTAINMENT BARRIER ~~EXAMPLE~~ EALs: (1 or 2 or 3 or 4 or 5 or 6 or 7 or 8)

The Containment Barrier includes the containment building, its connections up to and including the outermost containment isolation valves. This barrier also includes the main steam, feedwater, and blowdown line extensions outside the containment building up to and including the outermost secondary side isolation valve.

1. Critical Safety Function Status

~~This EAL is for PWRs using Critical Safety Function Status Tree (CSFST) monitoring and functional restoration procedures. For more information, please refer to Section 3.9 of this report.~~ RED path indicates an extreme challenge to the safety function. Containment-Red path is entered if containment pressure is greater than 46 psig. This pressure is the containment design pressure ~~derived from appropriate instrument readings and/or sampling results~~, and thus represents a potential loss of containment. Conditions leading to a containment RED path result from RCS barrier and/or Fuel Clad Barrier Loss. Thus, this EAL is primarily a discriminator between Site Area Emergency and General Emergency representing a potential loss of the third barrier. [Ref. 9, 10]

The barrier potential loss occurs when the plant parameter associated with the CSFST path is reached (not when the operator reads the CSFST in the EOP network). The phrase "Conditions requiring entry into..." is included in these thresholds to emphasize this intent.

There is no "Loss" EAL associated with this item.

2. Containment Pressure

Rapid unexplained loss of pressure (i.e., not attributable to containment spray or condensation effects) following an initial pressure increase indicates a loss of containment integrity. USAR Appendix K describes containment pressure response for a bounding LOCA. [Ref. 16]

Containment pressure and sump levels should increase as a result of the mass and energy release into containment from a LOCA. Thus, sump level or pressure not increasing indicates containment bypass and a loss of containment integrity.

The ~~(site-specific)~~ 46 PSIG for potential loss of containment is based on the containment design pressure. [Ref. 10]

If hydrogen concentration reaches or exceeds 6% in Containment, an explosive mixture exists. If the combustible mixture ignites, loss of the Containment barrier could occur.- To generate such levels of combustible gas, an inadequate core cooling situation must already have existed. ~~Existence of an explosive mixture means a hydrogen and oxygen concentration of at least the lower deflagration limit curve exists. The indications of potential loss under this EAL corresponds to some of those leading to the RED path in EAL #1 above and may be declared by those sites using CSFSTs.~~ As described above, this EAL is primarily a discriminator between Site Area Emergency and General Emergency representing a potential loss of the third barrier. [Ref. 3]

The ~~second~~ third potential loss EAL represents a potential loss of containment in that the containment heat removal/depressurization system ~~(e.g., containment sprays, ice condenser fans, etc.,~~ (but not including containment venting strategies) are either lost or performing in a degraded manner, as indicated by containment pressure greater than the setpoint (23 psig) at which the equipment was supposed to have actuated. A full train of depressurization equipment is one containment spray pump and two containment fan coil units. This equipment will provide 100% of the required cooling capacity during post-accident conditions. Each internal containment spray system consists of a spray pump, spray header, nozzles, valves, piping, instruments, and controls to ensure an operable flow path capable of taking suction from the RWST upon an ESF actuation signal. [Ref. 11, 12]

3. Core Exit Thermocouples

In this EAL, the ~~function~~ restoration procedures are those emergency operating procedures that address the recovery of the core cooling critical safety functions. The procedure is considered effective if the temperature is decreasing or if the vessel water level is increasing. ~~For units using the CSF status trees a direct correlation to those status trees can be made if the effectiveness of the restoration procedures is also evaluated as stated below.~~

Severe accident analyses (e.g., NUREG-1150) have concluded that function restoration procedures can arrest core degradation within the reactor vessel in a significant fraction of the core damage scenarios, and that the likelihood of containment failure is very small in these events. Given this, it is appropriate to provide a reasonable period to allow function restoration procedures to arrest the core melt sequence. Whether or not the procedures will be effective should be apparent within 15 minutes. The Emergency Director should make the declaration as soon as it is determined that the procedures have been, or will be ineffective. The reactor vessel levels chosen ~~should be~~are consistent with the emergency response guides (EOPS) ~~applicable to the facility~~for PINGP. [Ref. 1, 3]

Core exit thermocouple readings of 1200°F represent significant superheating of the coolant. This value corresponds to the temperature reading that indicates core cooling - RED in Fuel Clad Barrier EAL #1. Core exit thermocouple readings in excess of 700°F with reactor vessel level below 40% RVLIS Full Range indicate core exit superheating and core uncovery.

The conditions in this potential loss EAL represent an imminent core melt sequence which, if not corrected, could lead to vessel failure and an increased potential for containment failure. In conjunction with the Core Cooling and Heat Sink criteria in the Fuel and RCS barrier columns, this EAL would result in the declaration of a General Emergency -- loss of two barriers and the potential loss of a third. If the function restoration procedures are ineffective, there is no "success" path. [Ref. 1, 3]

There is no "Loss" EAL associated with this item.

4. SG Secondary Side Release With Primary To Secondary Leakage

This "loss" EAL recognizes that SG tube leakage can represent a bypass of the containment barrier as well as a loss of the RCS barrier. The first "loss" EAL addresses the condition in which a RUPTURED steam generator is also FAULTED. This condition represents a bypass of the RCS and containment barriers. In conjunction with RCS Barrier "loss" EAL #3, this would always result in the declaration of a Site Area Emergency. A faulted S/G means the existence of secondary side leakage that results in an uncontrolled lowering in steam generator pressure or the steam generator being completely depressurized. A ruptured S/G means the existence of primary-to-secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection. Confirmation should be based on diagnostic activities consistent with E-0, Reactor Trip or Safety Injection. [Ref. 8]

The second "loss" EAL addresses SG tube leaks that exceed 10 gpm in conjunction with a nonisolable release path to the environment from the affected steam generator. The threshold for establishing the nonisolable secondary side release is intended to be a prolonged release of radioactivity from the RUPTURED steam generator directly to the environment. This could be expected to occur when the main condenser is unavailable to accept the contaminated steam (i.e., SGTR with concurrent loss of offsite power and the RUPTURED steam generator is required for plant cooldown or a stuck open relief valve). If the main condenser is available, there may be releases via air ejectors, gland seal exhausters, and other similar controlled, and often monitored, pathways. These pathways do not meet the intent of a nonisolable release path to the environment. These minor releases are assessed using Abnormal Rad Levels / Radiological Effluent ICs. [Ref. 8]

~~Users~~ It should be realized that the two "loss" EALs described above could be considered redundant. This was recognized during the development process. The inclusion of an EAL that uses ~~Emegency~~Emergency Procedure commonly used terms like "ruptured and faulted" adds to the ease of the classification process and has been included based on this human factor concern.

~~The leakage threshold for this EAL has been increased with Revision 3. In the earlier revision, the threshold was leakage greater than T/S allowable. Since the prior revision, many plants have implemented reduced steam generator T/S limits (e.g., 150 gpd) as a defense in depth associated with alternate steam generator plugging criteria. The 150 gpd threshold is deemed too low for use as an emergency threshold.~~ A pressure boundary leakage of 10 gpm ~~was~~ is used as the threshold in IC SU5.1, RCS Leakage, and is deemed appropriate for this EAL. For smaller breaks, not exceeding the normal charging capacity threshold in RCS Barrier "Potential Loss" EAL #2 (RCS Leak Rate) or not resulting in ECCS actuation in EAL #3 (SG Tube Rupture), this EAL results in a ~~NO~~UE. For larger breaks, RCS barrier EALs #2 and #3 would result in an Alert. For SG tube ruptures which may involve multiple steam generators or unisolable secondary line breaks, this EAL would exist in conjunction with RCS barrier "Loss" EAL #3 and would result in a Site Area Emergency. Escalation to General Emergency would be based on "Potential Loss" of the Fuel Clad Barrier.

5. Containment Isolation Valve Status After Containment Isolation

This EAL is intended to address incomplete containment isolation that allows direct release to the environment. It represents a loss of the containment barrier.

The use of the modifier "direct" in defining the release path discriminates against release paths through interfacing liquid systems. The existence of an in-line charcoal filter does not make a release path indirect since the filter is not effective at removing fission noble gases. Typical filters have an efficiency of 95-99% removal of iodine. Given the magnitude of the core inventory of iodine, significant releases could still occur. In addition, since the fission product release would be driven by boiling in the reactor vessel, the high humidity in the release stream can be expected to render the filters ineffective in a short period.

There is no "Potential Loss" EAL associated with this item.

6. Significant Radioactive Inventory in Containment

The ~~(site-specific)~~800 R/hr reading is a value which indicates significant fuel damage well in excess of the EALs associated with both loss of Fuel Clad and loss of RCS Barriers. [Ref. 4, 5] ~~As stated in Section 3.8, a~~A major release of radioactivity requiring offsite protective actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant.

Regardless of whether containment is challenged, this amount of activity in containment, if released, could have such severe consequences that it is prudent to treat this as a potential loss of containment, such that a General Emergency declaration is warranted. NUREG-1228, "Source

Estimations During Incident Response to Severe Nuclear Power Plant Accidents," indicates that such conditions do not exist when the amount of clad damage is less than 20%. Accordingly, the EAL threshold corresponds to clad damage of 20%. [Ref. 4, 5]

~~Unless there is a (site-specific) analysis justifying a higher value, it is recommended that a radiation monitor reading corresponding to 20% fuel clad damage be specified here.~~

There is no "Loss" EAL associated with this item.

7. Other (Site-Specific) Indications

Instrumentation used for this EAL is consistent with that used in the Containment integrity EOP. There is no additional applicable indication to use ~~This EAL should cover other (site-specific) indications~~ that may unambiguously indicate loss or potential loss of the containment barrier~~, including indications from area or ventilation monitors in containment annulus or other contiguous buildings. If site emergency operating procedures provide for v~~Venting of the containment during an emergency is not used as a means of preventing catastrophic failure. [Ref. 9]~~, a Loss EAL should be included for the containment barrier. This EAL should be declared as soon as such venting is imminent. Containment venting as part of recovery actions is classified in accordance with the radiological effluent ICs.~~

8. Emergency Director Judgment

This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the Containment barrier is lost or potentially lost. Such a determination should include imminent barrier degradation, barrier monitoring capability and dominant accident sequences.

- Imminent barrier degradation exists if the degradation will likely occur within two hours based on a projection of current safety system performance. The term "imminent" refers to recognition of the inability to reach safety acceptance criteria before completion of all checks.

- Barrier monitoring capability is decreased if there is a loss or lack of reliable indicators. This assessment should include instrumentation operability concerns, readings from portable instrumentation and consideration of offsite monitoring results.

- Dominant accident sequences lead to degradation of all fission product barriers and likely entry to the CSFSTs. The Emergency Director should be mindful of the Loss of AC power (Station Blackout) and ATWS EALs to assure timely emergency classification declarations.

The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that must be considered in this EAL. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.
~~In addition, the inability to monitor the barrier should also be incorporated in this EAL as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost. (See also IC SG1, "Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power", for additional information.)~~

PINGP Basis Reference(s):

1. F-0.2 Core Cooling
2. F-0.3 Heat Sink
3. FR-C.1 Response to Inadequate Core Cooling
4. F3-17 Core Damage Assessment
5. Memo to EAL Upgrade Project File from Mel Agen dated 7/31/04 "Containment Rad Monitors & Fuel Cladding Damage Based on USAR"
6. F-0.4 Integrity
7. USAR Section 10.2.3
8. E-0 Reactor Trip or Safety Injection
9. F-0.5 Containment
10. USAR Section 5.2.1
11. Technical Specifications Table 3.3.2-1
12. Technical Specifications B3.6.5
13. Memo to EAL Upgrade Project File from Mel Agen dated 10/11/04 "R-9 Rad Monitors & Fuel Cladding Damage Based on USAR"
14. USAR Section 10.2.3.3.7
15. USAR Appendix D
16. USAR Appendix K

TABLE ~~5-H-1~~0

Recognition Category H

Hazards and Other Conditions Affecting Plant Safety

INITIATING CONDITION MATRIX

~~NO~~UE	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
HU1 Natural and Destructive Phenomena Affecting the PROTECTED AREA. *Op. Modes: All*	**HA1** Natural and Destructive Phenomena Affecting the Plant VITAL AREA. *Op. Modes: All*		
HU2 FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection. *Op. Modes: All*	**HA2** FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown. *Op. Modes: All*		
HU3 Release of Toxic or Flammable Gases Deemed Detrimental to Safe Operation of the Plant. *Op. Modes: All*	**HA3** Release of Toxic or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Safety Systems Required to Establish or Maintain Safe Shutdown. *Op. Modes: All*		
HU4 Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant. *Op. Modes: All*	**HA4** Confirmed Security Event in a Plant PROTECTED AREA. *Op. Modes: All*	**HS1** Confirmed Security Event in a Plant VITAL AREA. *Op. Modes: All*	**HG1** Security Event Resulting in Loss Of Physical Control of the Facility. *Op. Modes: All*
HU5 Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a ~~NOUE~~UE. *Op. Modes: All*	**HA6** Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert. *Op. Modes: All*	**HS3** Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency. *Op. Modes: All*	**HG2** Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency. *Op. Modes: All*
	HA5 Control Room Evacuation Has Been Initiated. *Op. Modes: All*	**HS2** Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established. *Op. Modes: All*	

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HU1

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Natural and Destructive Phenomena Affecting the PROTECTED AREA.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Levels: (HU1.1 or HU1.2 or HU1.3 or HU1.4 or HU1.5 or HU1.6-or HU1.7)

HU1.1. Earthquake felt in plant as indicated by VALID "Event Alarm" on Seismic Monitoring Panel.~~(Site-Specific) method of indicatinges felt earthquake.~~

HU1.2. Report by plant personnel of tornado or high winds ~~greater than~~GREATER THAN 95~~(site-specific)~~ mph striking within PROTECTED AREA boundary.

HU1.3. Vehicle crash into plant structures or systems within PROTECTED AREA boundary.

HU1.4. Report by plant personnel of an unanticipated EXPLOSION within PROTECTED AREA boundary resulting in VISIBLE DAMAGE to permanent structure or equipment.

HU1.5. Report of turbine failure resulting in casing penetration or damage to turbine or generator seals.

HU1.6. Uncontrolled flooding in~~(site-specific)~~ following areas of the plant that has the potential to affect safety related equipment needed for the current operating mode (Table H-1)

HU1.7. High or low river water level occurrences affecting the PROTECTED AREA as indicated by:

River intake level GREATER THAN 692 ft MSL

OR

River intake level LESS THAN 669.5 ft MSL.~~Table H-2 column "Unusual Event" high or low river water level occurrences affecting the PROTECTED AREA~~

~~(Site-Specific) occurrences affecting the PROTECTED AREA.~~

Table H-1 Plant Areas										
Area	**HU1.6**	**HU2.1***	**HA1.2**	**HA1.3**	**HA1.4**	**HA1.5**	**HA2.1**	**HA3.1***	**HA3.2***	**RA3.2**
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				
*Also consider areas contiguous to these										

Basis:

~~NO~~UE 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. Escalation of the event to an Alert occurs when the magnitude of the event is sufficient to result in damage to equipment contained in the specified location.

~~EAL #1~~HU1.1~~-should be developed on site-specific basis. D~~is based on damage that may be caused to some portions of the site, but should not affect ability of safety functions to operate. Method of detection ~~can be~~is based on seismic instrumentation ~~,~~and validated by ~~a reliable source, or operator~~Operator assessment [Ref. 1, 2, 3]. PINGP seismic monitoring instrumentation will record and annunciate ("Event Alarm") at seismic activity levels exceeding accelerations of 0.01 g vertical or 0.01 g horizontal. As defined in the EPRI-sponsored "Guidelines for Nuclear Plant Response to an Earthquake", dated October 1989, a *"felt earthquake"* is:

> An earthquake of sufficient intensity such that: (a) the vibratory ground motion is felt at the nuclear plant site and recognized as an earthquake based on a consensus of control room operators on duty at the time, and (b) for plants with operable seismic instrumentation, the seismic switches of the plant are activated. For most plants with seismic instrumentation, the seismic switches are set at an acceleration of about 0.01g.

~~EAL #2~~HU1.2 is based on the assumption that a tornado striking (touching down) or high winds within the PROTECTED AREA may have potentially damaged plant structures containing functions or systems required for safe shutdown of the plant. The high wind ~~site specific~~ value ~~in EAL#2 should be~~is based on ~~site-specific FSAR~~USAR design basis. All structures are designed to withstand the maximum potential loadings resulting from a wind speed of 100 mph. [Ref. 4]. However, winds greater than 100 mph cannot be read from instrumentation because full-scale readings only go up to near 100 mph but not greater than or equal to 100 mph. 95 mph was chosen as the classification threshold, as this reading will be on-scale. If such damage is confirmed visually or by other in-plant indications, the event may be escalated to Alert.

~~EAL #3~~HU1.3 is intended to address crashes of any vehicle type~~s~~ (land, air or water) large enough to cause significant damage to plant structures containing functions and systems required for safe shutdown of the plant. If the crash is confirmed to affect a plant VITAL AREA, the event may be escalated to Alert.

For ~~EAL #4~~HU1.4 only those EXPLOSIONs of sufficient force to damage permanent structures or equipment within the PROTECTED AREA should be considered. 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~~HU1.5 is intended to address main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the turbine generator. Of major concern is the potential for leakage of combustible fluids (lubricating oils) and gases (hydrogen cooling) to the plant environs. Actual FIREs and flammable gas build up are appropriately classified via HU2 and HU3. Generator seal damage observed after generator purge does not meet the intent of this EAL because it did not impact normal operation of the plant. This EAL is consistent with the definition of a ~~NOUE~~UE while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment. Escalation of the emergency classification is based on potential damage done by missiles generated by the failure or ~~by the radiological releases for a BWR, or~~ in conjunction with a steam generator tube rupture~~, for a PWR~~. These latter events would be classified by the radiological ICs or Fission Product Barrier ICs.

~~EAL #6~~HU1.6 addresses the effect of flooding caused by internal events such as component failures, equipment misalignment, or outage activity mishaps. ~~The site-specific areas~~The Plant Areas listed in Table H-1, column HU1.6 include those areas that contain systems required for safe shutdown of the plant, that are not designed to be wetted or submerged. Escalation of the emergency classification is based on the damage caused or by access restrictions that prevent necessary plant operations or systems monitoring. [Ref. 6].

~~The plant's IPEEE may provide insight into areas to be considered when developing this EAL.~~

~~EAL #7~~HU1.7 covers ~~other site-specific phenomena such as hurricane, flood, or seiche. These EALs can also be precursors of more serious events. In particular, sites subject to severe weather as defined in the NUMARC station blackout initiatives, should include an EAL based on activation of the severe weather mitigation procedures (e.g., precautionary shutdowns, diesel testing, staff call-outs, etc.).~~ high river water level conditions that could be a precursor of more serious events as well as low river water level conditions which may threaten operability of plant cooling systems. A river level of 669.5 ft Mean Sea Level (MSL) corresponds to the trip of the normal operating cooling water pumps (11/12) on low level. [Ref. 5].

The Prairie Island plant is designed such that all areas critical to nuclear safety are protected against the effects of the probable maximum flood and associated maximum wave run-up. Plant operating procedures and emergency plans state the flood stage elevations at which plant protective measures must be taken. These procedures will require placing the unit in Mode 3, Hot Standby, when flood stage elevations exceed 692 feet at the plant site. [Ref. 7].

PINGP Basis Reference(s):

1. AB-3 Earthquakes
2. C47023-0603 Event Alarm
3. Plant Modification 03MP01
4. AB-2 Tornado/Severe Thunderstorm/High Winds
5. C47020-0106 11(12) Cooling Water pump Locked Out
6. C41.5 – AR 26, ERCS Operating Procedure Alarms Summary/Displays/Responses
7. AB-4 Flood

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU2

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Level:

HU2.1. FIRE in buildings or areas contiguous (in actual contact with or immediately adjacent) to any Table H-1 ~~of the following (site-specific)~~ areas not extinguished within 15 minutes of control room notification or verification of a control room alarm.

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				

*Also consider areas contiguous to these

~~(Site-specific) list~~

Basis:

The purpose of this IC is to address the magnitude and extent of FIREs that may be potentially significant precursors to damage to safety systems. As used here, ~~D~~detection is visual observation and report by plant personnel or sensor alarm indication. The 15 minute time period begins with a credible notification that a FIRE is occurring, or indication of a VALID fire detection system alarm. Verification of a fire detection system alarm includes actions that can be taken with the control room or other nearby site-specific location 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). The ~~site-specific list should be~~applicable areas are limited and ~~applies~~ apply to buildings and areas contiguous (in actual contact with or immediately adjacent) to plant VITAL AREAs or other significant buildings or areas [Ref. 1, 2]. The intent of this IC is not to include buildings (i.e., warehouses) or areas that are not contiguous (in actual contact with or immediately adjacent) to plant VITAL AREAs. This EAL excludes FIREs within non-contiguous administration buildings, waste-basket FIREs~~,~~ and other small FIREs of no safety consequence.

Escalation to a higher emergency class is by IC HA24, "FIRE Affecting the Operability of Plant Safety Systems Required for the Current Operating Mode".

PINGP Basis Reference(s):

1. USAR Section 12.2.1.1 Classification of Structures and Equipment
2. USAR Table 12.2-1 Classification of Structures, Systems and Components

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU3

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Release of Toxic or Flammable Gases Deemed Detrimental to Normal Operation of the Plant.

Operating Mode Applicability: All

~~**Example Emergency Action Levels:**~~**Emergency Action Levels:** (HU3.1 or HU3.2)

HU3.1. Report or detection of toxic or flammable gases that has or could enter the site area boundary in amounts that can affect NORMAL PLANT OPERATIONS.

HU3.2. Report by Local, County or State Officials for evacuation or sheltering of site personnel based on an offsite event.

Basis:

This IC is based on the existence of uncontrolled releases of toxic or flammable gas that may enter the site boundary and affect normal plant operations. It is intended that releases of toxic or flammable gases are of sufficient quantity, and the release point of such gases is such that normal plant operations would be affected. This would preclude small or incidental releases, or releases that do not impact structures needed for plant operation. The EALs are intended to not require significant assessment or quantification. The IC assumes an uncontrolled process that has the potential to affect plant operations, or personnel safety.

Escalation of this EAL is via HA3, which involves a quantified release of toxic or flammable gas affecting VITAL AREAs.

PINGP Basis Reference(s):

None

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU4

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (HU4.1 or HU4.2)

HU4.1. Security Shift Supervision reports ANY of the following:
- Suspected SABOTAGE device discovered within the plant PROTECTED AREA
- Suspected SABOTAGE device discovered outside the PROTECTED AREA or in the plant switchyard
- Confirmed tampering with safety-related equipment
- A HOSTAGE/EXTORTION situation that disrupts NORMAL PLANT OPERATIONS
- CIVIL DISTURBANCE or STRIKE ACTION which disrupts NORMAL PLANT OPERATIONS
- Internal disturbance that is not a short lived or that is not a harmless outburst involving ANY individuals within the PROTECTED AREA
- Malevolent use of a vehicle outside the PROTECTED AREA which disrupts NORMAL PLANT OPERATIONS~~Security events as determined from (site-specific) Safeguards Contingency Plan and reported by the (site-specific) security shift supervision~~

HU4.2. A credible site specific security threat notification.

Basis:

Reference is made to ~~(site-specific)~~PINGP security shift supervision because these individuals are the designated personnel on-site qualified and trained to confirm that a security event is occurring or has occurred. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the plant ~~Safeguards Contingency~~Security Plan.

~~This EAL 1~~ HU4.1 is based on ~~(site-specific) Site~~PINGP Security Plans. Security Contingency Events are those that are applicable to this EAL. Security events which do not represent a potential degradation in the level of safety of the plant, are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72. Examples of security events that indicate Potential Degradation in the Level of Safety of the Plant are provided below for consideration.

Consideration ~~should be~~was given to the following types of events when evaluating an event against the criteria of the site specific Security Contingency Plan: The PINGP Security Plan considers these types of events: SABOTAGE, HOSTAGE / EXTORTION, CIVIL DISTURBANCE, and STRIKE ACTION.

INTRUSION into the plant PROTECTED AREA by a HOSTILE FORCE would result in EAL escalation to an ALERT.

The intent of ~~EAL 2~~ HU4.2 is to ensure that appropriate notifications for the security threat are made in a timely manner. Only the plant to which the specific threat is made need declare the ~~Notification of an~~ Unusual Event.

The determination of "credible" is made through use of information found in the ~~(site-specific)~~ PINGP Security~~Safeguards Contingency~~ Plan.

A higher initial classification could be made based upon the nature and timing of the threat and potential consequences. The licensee shall consider upgrading the emergency response status and emergency classification in accordance with the ~~[site-security-specific~~PINGP Security] ~~Safeguards Contingency~~ Plan and Emergency Plan~~s~~.

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)
2. NMC fleet Security Threat Assessment Policy, SE 0018

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU5

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a ~~NOUE~~UE.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Level:

HU5.1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or 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.

Basis:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the ~~NOUE~~UE emergency class.

From a broad perspective, one area that may warrant Emergency Director judgment is related to likely or actual breakdown of site-specific event mitigating actions. Examples to consider include inadequate emergency response procedures, transient response either unexpected or not understood, failure or unavailability of emergency systems during an accident in excess of that assumed in accident analysis, or insufficient availability of equipment and/or support personnel.

PINGP Basis Reference(s):

None

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA1

Initiating Condition -- ALERT

Natural and Destructive Phenomena Affecting the Plant VITAL AREA.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (HA1.1 or HA1.2 or HA1.3 or HA1.4 or HA1.5 or HA1.6)

HA1.1. Seismic Event GREATER THAN Operating Basis Earthquake (OBE) as indicated by "OBE" alarm on Seismic Monitoring Panel~~(Site-Specific) method indicates Seismic Event greater than Operating Basis Earthquake (OBE)~~.

HA1.2. Tornado or -high winds GREATER THAN ~~(site-specific)~~95 mph within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures / equipment or Control Room indication of degraded performance of those systems (Table H-1).

- ~~Reactor Building~~
- ~~Intake Building~~
- ~~Ultimate Heat Sink~~
- ~~Refueling Water Storage Tank~~
- ~~Diesel Generator Building~~
- ~~Turbine Building~~
- ~~Condensate Storage Tank~~
- ~~Control Room~~
- ~~Other (Site-Specific) Structures.~~

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X

Condensate Storage Tanks			X	X	X	X				
*Also consider areas contiguous to these										

HA1.3. Vehicle crash within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures or equipment therein or C~~c~~ontrol Room indication of degraded performance of those systems (Table H-1).

~~:~~

~~Reactor Building~~
~~Intake Building~~
~~Ultimate Heat Sink~~
~~Refueling Water Storage Tank~~
~~Diesel Generator Building~~
~~Turbine Building~~
~~Condensate Storage Tank~~
~~Control Room~~
~~Other (Site-Specific) Structures.~~

HA1.4. Turbine failure-generated missiles result in any VISIBLE DAMAGE to or penetration of any of the following plant areas (Table H-1).~~:~~

~~-(site-specific) list.~~

HA1.5. Uncontrolled flooding in ~~(site-specific)~~any Table H-1 area~~s~~ of the plant that results in degraded safety system performance as indicated in the control room or that creates industrial safety hazards (e.g., electric shock) that precludes access necessary to operate or monitor safety equipment.

HA1.6. High or low river water level occurrences affecting the PROTECTED AREA as indicated by:

River intake level GREATER THAN 698 ft MSL

OR

River intake level LESS THAN 666.5 ft MSL.
~~(Site-Specific) occurrences within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to plant structures containing equipment necessary for safe shutdown, or has caused damage as evidenced by control room indication of degraded performance of those systems.~~

Basis:

The EALs in this IC escalate from the ~~NOUE~~UE EALs in HU1 in that the occurrence of the event has resulted in VISIBLE DAMAGE to plant structures or areas containing equipment necessary for a safe shutdown (Table H-1), or has caused damage to the safety systems in those structures evidenced by control indications of degraded system response or performance. The occurrence of VISIBLE DAMAGE and/or degraded system response is intended to discriminate against lesser events. The initial "report" should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this EAL to assess the actual magnitude of the damage. The significance here is not that a particular system or structure was damaged, but rather, that the event was of sufficient magnitude to cause this degradation. Escalation to higher classifications occur on the basis of other ICs (e.g., System Malfunction).

~~EAL #1~~HA1.1 is based on the USAR design basis operating basis earthquake (OBE).~~the FSAR operating basis earthquake (OBE) of 0. g acceleration.~~ ~~should be based on site-specific FSAR design basis.~~ Seismic monitoring instrumentation will annunciate OBE levels exceeded ("OBE Exceeded" Alarm) at vertical or horizontal accelerations greater than the PINGP OBE (0.06g and 0.04g) design values between 2 and 10 Hertz. Seismic events of this magnitude can result in a plant VITAL AREA being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems. [Ref. 1, 2, 3]~~See EPRI-sponsored "Guidelines for Nuclear Plant Response to an Earthquake", dated October 1989, for information on seismic event categories.~~

~~EAL #2 should be based on site-specific FSAR design basis.~~HA1.2 is based on the USAR design basis. All structures are designed to withstand the maximum potential loadings resulting from a wind speed of 100 mph. [Ref. 4]. However, winds greater than 100 mph cannot be read from instrumentation because full-scale readings only go up to near 100 mph but not greater than or equal to 100 mph. 95 mph was chosen as the classification threshold, as this will be on-scale. Wind loads of this magnitude can cause damage to safety functions. The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA.

~~EAL #s 2, 3, 4, 5 should specify site-specific structures or areas containing systems and functions required for safe shutdown of the plant.~~

~~EAL #3~~HA1.3 is intended to address crashes of vehicle types large enough to cause significant damage to plant structures containing functions and systems required for safe shutdown of the plant. The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA.

~~EAL~~ #HA1.4 is intended to address the threat to safety related equipment imposed by missiles generated by main turbine rotating component failures. The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA, including safe shutdown equipment.~~This site-specific list of areas should include all areas containing safety-related equipment, their controls, and their power supplies.~~ This EAL is, therefore, consistent with the definition of an ALERT in that if missiles have damaged or penetrated areas containing safety-related equipment the potential exists for substantial degradation of the level of safety of the plant.

~~EAL #5~~HA1.5 addresses the effect of internal flooding that has resulted in degraded performance of systems affected by the flooding, or has created industrial safety hazards (e.g., electrical shock) that preclude necessary access to operate or monitor safety equipment. The inability to operate or monitor safety equipment represents a potential for substantial degradation of the level of safety of the plant. This flooding may have been caused by internal events such as component failures, equipment misalignment, or outage activity mishaps. The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA, including safe shutdown equipment. The site-specific areas includes those areas that contain systems required for safe shutdown of the plant, that are not designed to be wetted or submerged. ~~The plant's IPEEE may provide insight into areas to be considered when developing this EAL.~~

~~EAL #6~~HA1.6 covers ~~other site-specific phenomena such as hurricane,~~ flooding~~, or seiche~~. ~~These~~ This EAL~~s~~ can ~~also~~ be a precursor~~s~~ of more serious events. River water level greater than 698 ft MSL is the highest level at which the transformers remain functional. River water level less than 666.5 ft is the level corresponding to the loss of Lock & Dam #3 and threatens the availability of the ultimate heat sink [Ref. 5, 6].

PINGP Basis Reference(s):

1. AB-3 Earthquakes
2. C47023-0603 Event Alarm
3. Plant Modification 03MP01
4. AB-2 Tornado/Severe Thunderstorm/High Winds
5. USAR Section 2.4 Hydrology
6. AB-4 Flood

HA2

Initiating Condition – ALERT

FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Level:

HA2.1. FIRE or EXPLOSION in any of the following ~~(site-specific)~~ areas (Table H-1):

~~(Site-specific) list~~

AND

Affected system parameter indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area.

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				

*Also consider areas contiguous to these

Basis:

The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA, including safe shutdown equipment. [Ref. 1, 2]. ~~Site-specific areas containing~~

~~functions and systems required for the safe shutdown of the plant should be specified. Site-Specific Safe Shutdown Analysis should be consulted for equipment and plant areas required to establish or maintain safe shutdown.~~ This ~~will~~ makes it easier to determine if the FIRE or EXPLOSION is potentially affecting one or more redundant trains of safety systems. Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels / Radiological Effluent, or Emergency Director Judgment ICs.

This EAL addresses a FIRE / EXPLOSION and not the degradation in performance of affected systems. System degradation is addressed in the System Malfunction EALs. The reference to damage of systems is used to identify the magnitude of the FIRE / EXPLOSION and to discriminate against minor FIREs / EXPLOSIONs. The reference to safety systems is included to discriminate against FIREs / EXPLOSIONs in areas having a low probability of affecting safe operation. The significance here is not that a safety system was degraded but the fact that the FIRE / EXPLOSION was large enough to cause damage to these systems. Thus, the designation of a single train was intentional and is appropriate when the FIRE / EXPLOSION is large enough to affect more than one component.

This situation is not the same as removing equipment for maintenance that is covered by a plant's Technical Specifications. Removal of equipment for maintenance is a planned activity controlled in accordance with procedures and, as such, does not constitute a substantial degradation in the level of safety of the plant. A FIRE / EXPLOSION is an UNPLANNED activity and, as such, does constitute a substantial degradation in the level of safety of the plant. In this situation, an Alert classification is warranted.

The inclusion of a "report of VISIBLE DAMAGE" should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this EAL to assess the actual magnitude of the damage. The occurrence of the EXPLOSION with reports of evidence of damage is sufficient for declaration. The declaration of an Alert and the activation of the Technical Support Center will provide the Emergency Director with the resources needed to perform these damage assessments. The Emergency Director also needs to consider any security aspects of the EXPLOSIONs, if applicable.

PINGP Basis Reference(s):

1. USAR Section 12.2.1.1 Classification of Structures and Equipment
2. USAR Table 12.2-1 Classification of Structures, Systems and Components

Initiating Condition – ALERT

Release of Toxic or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Establish or Maintain Safe Shutdown.

Operating Mode Applicability: All

~~**Example Emergency Action Levels:**~~**Emergency Action Levels:** (HA3.1 or HA3.2)

HA3.1. Report or detection of toxic gases within or contiguous to Table H-1 areas~~a VITAL AREA~~ in concentrations that may result in an atmosphere IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				

*Also consider areas contiguous to these

HA3.2. Report or detection of gases in concentration GREATER THAN the LOWER FLAMMABILITY LIMIT within or contiguous to Table H-1 areas~~a VITAL AREA~~.

Basis:

This IC is based on gases that affect the safe operation of the plant. This IC applies to buildings and areas contiguous to plant VITAL AREAs or other significant buildings or areas~~(i.e., service~~

~~water pump house)~~ [Ref. 1, 2]. The intent of this IC is not to include buildings (e.g., warehouses) or other areas that are not contiguous or immediately adjacent to plant VITAL AREAs. It is appropriate that increased monitoring be done to ascertain whether consequential damage has occurred. Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels / Radioactive Effluent, or Emergency Director Judgment ICs.

~~EAL #1~~HA3.1 is met if measurement of toxic gas concentration results in an atmosphere that is IDLH within a VITAL AREA or any area or building contiguous to VITAL AREA. Exposure to an IDLH atmosphere will result in immediate harm to unprotected personnel, and would preclude access to any such affected areas.

~~EAL #2~~HA3.2 is met when the flammable gas concentration in a VITAL AREA or any building or area contiguous to a VITAL AREA exceed the LOWER FLAMMABILITY LIMIT. Flammable gasses, such as hydrogen and acetylene, are routinely used to maintain plant systems (hydrogen) or to repair equipment/components (acetylene - used in welding). This EAL addresses concentrations at which gases can ignite/support combustion. An uncontrolled release of flammable gasses within a facility structure has the potential to affect safe operation of the plant by limiting either operator or equipment operations due to the potential for ignition and resulting equipment damage/personnel injury. Once it has been determined that an uncontrolled release is occurring, then sampling must be done to determine if the concentration of the released gas is within this range.

PINGP Basis Reference(s):

1. USAR Section 12.2.1.1 Classification of Structures and Equipment
2. USAR Table 12.2-1 Classification of Structures, Systems and Components

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA4

Initiating Condition – ALERT

Confirmed Security Event in a Plant PROTECTED AREA.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (HA4.1 or HA4.2)

HA4.1. INTRUSION into the plant PROTECTED AREA by a HOSTILE FORCE.

HA4.2. Security Shift Supervision reports any of the following:

- SABATOGE device discovered in the plant PROTECTED AREA
- Standoff attack on the PROTECTED AREA by a HOSTILE FORCE (i.e., Sniper)
- ANY security event of increasing severity that persists for > 30 min.:
  - Credible BOMB threats
  - HOSTAGE/EXTORTION
  - Suspicious FIRE or EXPLOSION
  - Significant Security System Hardware Failure
  - Loss of Guard Post Contact~~Other security events as determined from (site-specific) Safeguards Contingency Plan and reported by the (site-specific) security shift supervision~~

Basis:

This class of security events represents an escalated threat to plant safety above that contained in the ~~NOUE~~UE. ~~A confirmed INTRUSION report is satisfied if physical evidence indicates the presence of a HOSTILE FORCE within the PROTECTED AREA.~~

HA4.1 A confirmed INTRUSION report is satisfied if physical evidence indicates the presence of a HOSTILE FORCE within the PROTECTED AREA.

HA4.2 The Security Plan identifies numerous events/conditions that constitute a threat/compromise to station security. Only those events that involve actual or potential substantial degradation to the level of safety of the plant are considered. ~~Consideration should be given to the following types of events when evaluating an event against the criteria of t~~The ~~site specific~~PINGP Security ~~Contingency~~ Plan includes consideration of: SABOTAGE, HOSTAGE / EXTORTION, and STRIKE ACTION.~~The Safeguards Contingency Plan identifies numerous events/conditions that constitute a threat/compromise to a Station's security. Only those events that involve Actual or Potential Substantial degradation to the level of safety of the plant need to be considered.~~ The following events would not normally meet this requirement; (e.g., Failure by a Member of the Security Force to carry out an assigned/required duty, internal disturbances, loss/compromise of safeguards materials or strike actions).

INTRUSION into a VITAL AREA by a HOSTILE FORCE will escalate this event to a Site Area Emergency.

Reference is made to PINGP ~~(site-specific) s~~Security S~~s~~hift S~~s~~upervision 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.

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)
2. NMC fleet Security Threat Assessment Policy, SE 0018

HA5

Initiating Condition -- ALERT

Control Room Evacuation Has Been Initiated.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Level:

HA5.1. Entry into 1(2)C1.3 AOP-1 Shutdown from Outside the Control Room or F-5 Appendix B Control Room Evacuation (Fire) ~~(site specific) procedure~~ for control room evacuation.

Basis:

With the control room evacuated, additional support, monitoring and direction through the Technical Support Center and/or other emergency response facility is necessary. 1(2)C1.3 AOP-1, Shutdown from Outside the Control Room, and F-5 Appendix B, Control Room Evacuation (Fire), provide specific instructions for evacuating the Control Room and establishing plant control at the remote Hot Shutdown Panels. Inability to establish plant control from outside the control room will escalate this event to a Site Area Emergency.

PINGP Basis Reference(s):

1. 1C1.3 & 2C1.3 AOP-1 Shutdown from Outside the Control Room

2. F-5 Appendix B Control Room Evacuation (Fire)

HA6

Initiating Condition -- ALERT

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Level:

HA6.1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely 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~~-~~.

Basis:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Alert emergency class.

PINGP Basis Reference(s):

None

HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

HS1

Initiating Condition – SITE AREA EMERGENCY

Confirmed Security Event in a Plant VITAL AREA.

Operating Mode Applicability: All

~~Example Emergency Action Levels:~~Emergency Action Levels: (HS1.1 or HS1.2)

HS1.1. INTRUSION into the plant VITAL AREA by a HOSTILE FORCE.

HS1.2. Security Shift Supervision reports ANY of the following:

- A security event that results in the loss of control of ANY VITAL AREAS (other than Control Room)
- Imminent loss of physical control of the facility (remote shutdown capability) due to a security event
- A confirmed SABOTAGE device discovered in a VITAL AREA

~~Other security events as determined from (site-specific) Safeguards Contingency Plan and reported by the (site-specific) security shift supervision~~

Basis:

This class of security events represents an escalated threat to plant safety above that contained in the Alert IC in that a HOSTILE FORCE has progressed from the PROTECTED AREA to a VITAL AREA.

Consideration ~~should be~~is given to the following types of events when evaluating an event against the criteria of the ~~site-specific~~PINGP Security ~~Contingency~~ Plan: SABOTAGE and HOSTAGE / EXTORTION. The PINGP ~~Safeguards Contingency~~Security Plan identifies numerous events/conditions that constitute a threat/compromise to a ~~Station's~~ station's security. Only those events that involve a~~A~~ctual or l~~L~~ikely m~~M~~ajor failures of plant functions needed for protection of the public need to be considered. The following events would not normally meet this requirement; (e.g., Failure by a Member of the Security Force to carry out an assigned/required duty, internal disturbances, loss/compromise of safeguards materials or strike actions).

Loss of p~~P~~lant c~~C~~ontrol would escalate this event to a GENERAL EMERGENCY.

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

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)

2. <u>NMC fleet Security Threat Assessment Policy, SE 0018</u>

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS2

Initiating Condition – SITE AREA EMERGENCY

Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Level:

HS2.1. Control room evacuation has been initiated.

AND

Control of the plant cannot be established per 1(2)C1.3 AOP-1, Shutdown from Outside the Control Room or F-5 Appendix B, Control Room Evacuation (Fire) ~~[(site-specific) procedure number(s) and name(s)]~~ within ~~[(site-specific]~~15~~)~~ minutes.

Basis:

Expeditious transfer of safety systems has not occurred but fission product barrier damage may not yet be indicated. The intent of this IC is to capture those events where control of the plant cannot be reestablished in a timely manner. ~~Site-specific time for transfer based on analysis or assessments as to how quickly control must be reestablished without core uncovering and/or core damage.~~ This time should not exceed 15 minutes~~without additional justification~~. The determination of whether or not control is established at the remote shutdown panel is based on Emergency Director (ED) judgment. The ED is expected to make a reasonable, informed judgment within the ~~site-specific~~ time for transfer that the ~~licensee~~ operator has control of the plant from the remote shutdown panel.

1(2)C1.3 AOP-1, Shutdown from Outside the Control Room and F-5 Appendix B, Control Room Evacuation (Fire), provide specific instructions for evacuating the Control Room and establishing plant control at the remote Hot Shutdown Panels.

The intent of the EAL is to establish control of important plant equipment and knowledge of important plant parameters in a timely manner. Primary emphasis should be placed on those components and instruments that supply protection for and information about safety functions. Typically, these safety functions are reactivity control (ability to shutdown the reactor and maintain it shutdown), RCS inventory~~reactor water level~~ (ability to cool the core), and secondary heat removal~~decay heat removal~~ (ability to maintain a heat sink)~~ for a BWR~~. ~~The equivalent functions for a PWR are reactivity control, RCS inventory, and secondary heat removal.~~

Escalation of this event, if appropriate, would be by Fission Product Barrier Degradation, Abnormal Rad Levels/Radiological Effluent, or Emergency Director Judgment ICs.

PINGP Basis Reference(s):

1. 1C1.3 & 2C1.3 AOP-1 Shutdown from Outside the Control Room
2. F-5 Appendix B Control Room Evacuation (Fire)

HS3

Initiating Condition – SITE AREA EMERGENCY

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency.

Operating Mode Applicability: All

~~Example~~ Emergency Action Level:

HS3.1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

Basis:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency class description for Site Area Emergency.

PINGP Basis Reference(s):

None

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HG1

Initiating Condition – GENERAL EMERGENCY

Security Event Resulting in Loss Of Physical Control of the Facility.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Level:

HG1.1. A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions as indicated by loss of physical control of EITHER:

A VITAL AREA such that operation of equipment required for safe shutdown is lost

OR

Spent fuel pool cooling systems if imminent fuel damage is likely (e.g. freshly off-loaded reactor core in the pool).

Basis:

This IC encompasses conditions under which a HOSTILE FORCE has taken physical control of VITAL AREAs (containing vital equipment or controls of vital equipment) required to maintain safety functions and control of that equipment cannot be transferred to and operated from another location. ~~Typically, t~~These safety functions are reactivity control (ability to shut down the reactor and keep it shutdown) ~~reactor water level~~RCS inventory (ability to cool the core), and ~~decay~~ secondary heat removal (ability to maintain a heat sink)~~ for a BWR~~. ~~The equivalent functions for a PWR are reactivity control, RCS inventory, and secondary heat removal.~~ Loss of physical control of the control room or remote shutdown capability alone may not prevent the ability to maintain safety functions. If control of the plant equipment necessary to maintain safety functions can be transferred to another location, then the above initiating condition is not met.

This EAL ~~should also~~ addresses loss of physical control of spent fuel pool cooling systems because loss of spent fuel pool cooling could result in significant fuel damage, especially if a reactor core has been recently offloaded.~~if imminent fuel damage is likely (e.g., freshly off-loaded reactor core in pool)~~.

~~Loss of physical control of the control room or remote shutdown capability alone may not prevent the ability to maintain safety functions per se. Design of the remote shutdown capability and the location of the transfer switches should be taken into account.~~

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)

Initiating Condition – GENERAL EMERGENCY

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency.

Operating Mode Applicability: All

~~Example Emergency~~Emergency Action Level:

HG2.1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Basis:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the General Emergency class.

PINGP Basis Reference(s):

None

Table S-0

Recognition Category S

System Malfunction

INITIATING CONDITION MATRIX

N~~O~~UE	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
SU1 Loss of All Offsite Power to Essential ~~Busses~~Buses for GREATER THAN 15 Minutes. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SA5** AC power capability to essential ~~busses~~buses reduced to a single power source for GREATER THAN 15 minutes such that any additional single failure would result in station blackout. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SS1** Loss of All Offsite Power and Loss of All Onsite AC Power to Essential ~~Busses~~Buses. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SG1** Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power to Essential ~~Busses~~Buses. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*
	SA2 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor ~~Scram~~ Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual ~~Scram~~ Trip Was Successful. *Op. Modes: Power Operation, Startup, Hot Standby*	**SS2** Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor ~~Scram~~ Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual ~~Scram~~ Trip Was NOT Successful. *Op. Modes: Power Operation, Startup*	**SG2** Failure of the Reactor Protection System to Complete an Automatic ~~Scram~~ Trip and Manual ~~Scram~~ Trip was NOT Successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core. *Op. Modes: Power Operation, Startup*
SU2 Inability to Reach Required Shutdown Within Technical Specification Limits. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SA3** *Deleted*	**SS4** Complete Loss of Heat Removal Capability. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	
SU3 UNPLANNED Loss of Most or All Safety System Annunciation or Indication in The Control Room for GREATER THAN 15 Minutes *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SA4** UNPLANNED Loss of Most or All Safety System Annunciation or Indication in Control Room With Either (1) a SIGNIFICANT TRANSIENT in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SS6** Inability to Monitor a SIGNIFICANT TRANSIENT in Progress. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	

Recognition Category S

System Malfunction

INITIATING CONDITION MATRIX

SU7 *Deleted*

SU4 Fuel Clad Degradation.
Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown

SU5 RCS Leakage.
Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown

SU6 UNPLANNED Loss of All Onsite or Offsite Communications Capabilities.
Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown

SU8 Inadvertent Criticality.
Op Modes: Hot Standby, Hot Shutdown

SA1 *Deleted*

SS3 Loss of All Vital DC Power.
Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown

SS5 *Deleted*

SYSTEM MALFUNCTION

SU1

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Loss of All Offsite Power to Essential ~~Busses~~Buses for GREATER THAN~~reater Than~~ 15 Minutes.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SU1.1. Loss of all offsite power to both Buses 15(25) and 16(26) ~~(site-specific) transformers~~ for GREATER THAN~~greater than~~ 15 minutes.

AND

At least ~~(site-specific)~~two emergency generators are supplying power to emergency busses.

Basis:

Prolonged loss of AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete Loss of AC Power (e.g., Station Blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This EAL is indicated by the loss of all offsite AC power to the 4.16KV safeguards buses. Safeguards Buses 15(25) and 16(26) are the Unit 1(2) 4.16KV essential/emergency buses. PINGP emergency diesel generators (EDG) D1 (5) and D2 (6) are the "emergency generators". Two EDGs must be supplying power, one generator available for each bus.

No credit is provided for restoration of power to a non-affected unit bus. However, bus ties between buses 15 (Unit 1) and 25 (Unit 2) and between buses 16 (Unit 1) and 26 (Unit 2) are available to provide AC power to the affected unit safeguards buses from the unaffected unit and therefore PINGP takes credit for the redundant power source for this IC. However, the inability to effect the cross-tie within 15 minutes warrants declaring a UE.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

~~Plants that have the capability to cross-tie AC power from a companion unit may take credit for the redundant power source in the associated EAL for this IC. Inability to effect the cross-tie within 15 minutes warrants declaring a NOUE.~~

SYSTEM MALFUNCTION

SU2

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Inability to Reach Required Shutdown Within Technical Specification Limits.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SU2.1. Plant is not brought to required operating mode within ~~(site-specific)~~ Technical Specifications LCO Action Statement Time.

Basis:

Limiting Conditions of Operation (LCOs) require the plant to be brought to a required shutdown mode when the Technical Specification required configuration cannot be restored. Depending on the circumstances, this may or may not be an emergency or precursor to a more severe condition. In any case, the initiation of plant shutdown required by the ~~site~~ PINGP Technical Specifications requires a four-hour report under 10 CFR 50.72 (b)(2) Four-hour reports Non-emergency events. The plant is within its safety envelope when being shut down within the allowable action statement time in the Technical Specifications. An immediate ~~NO~~UE is required when the plant is not brought to the required operating mode within the allowable action statement time in the Technical Specifications. Declaration of a ~~NO~~UE is based on the time at which the LCO-specified action statement time period elapses under the site Technical Specifications and is not related to how long a condition may have existed. Other required Technical Specification shutdowns that involve precursors to more serious events are addressed by other System Malfunction, Hazards, or Fission Product Barrier Degradation ICs.

PINGP Basis Reference(s):

None

SYSTEM MALFUNCTION

SU3

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of Most or All Safety System Annunciation or Indication in The Control Room for Greater Than 15 Minutes

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

~~E~~SU3.1. UNPLANNED loss of most or all ~~(site-specific)~~ annunciators or indicators associated with safety systems for ~~greater than~~GREATER THAN 15 minutes.

- Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2) NIS Racks I, II, III, IV, and ERCS Alarms

Basis:

This IC and its associated EAL are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment.

"Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

Recognition of the availability of computer based indication equipment is considered (e.g., SPDS, plant computer, etc.) via the reference to Emergency Response Computer System (ERCS) alarms.

Quantification of "Most" is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions.

The focus of the EAL is on annunciators. ~~It is further recognized that most t~~The plant design~~s~~ also provide~~s~~ redundant safety system and accident monitoring indication powered from separate uninterruptable power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This ~~will be~~is addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the N~~O~~UE is based on SU2 "Inability to Reach Required Shutdown Within Technical Specification Limits."

~~(Site specific)~~The scope of annunciators ~~or~~ and indicators for this EAL is all-inclusive, thus it ~~must~~ includes those identified and used in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., area, process, and/or effluent rad monitors, etc.).

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses. Due to the limited number of safety systems in operation during cold shutdown, refueling, and defueled modes, no IC is indicated during these modes of operation.

This ~~NO~~UE will be escalated to an Alert if a transient is in progress during the loss of annunciation or indication.

PINGP Basis Reference(s):

1. USAR Section 7.8.1
2. USAR Figure 7.8-1

SYSTEM MALFUNCTION

SU4

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Fuel Clad Degradation.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency Action Levels:~~Emergency Action Levels: (SU4.1 or SU4.2)

SU4.1. Radiation Monitor 1(2)R-9 GREATER THAN 2.4 R/hr indicating fuel clad degradation~~(Site-specific) radiation monitor readings indicating fuel clad degradation greater than Technical Specification allowable limits.~~

SU4.2. ~~(Site-specific) c~~Coolant sample activity GREATER THAN Technical Specification 3.4.17 allowable limits ~~value~~ indicating fuel clad degradation~~greater than Technical Specification allowable limits~~.

Basis:

This IC is included as a ~~N~~OUE because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems.

~~EAL #1~~SU4.1 addresses ~~site-specific radiation monitor readings such as BWR air ejector monitors, PWR~~ the RCS Letdown Line Area Monitor~~failed fuel monitors, etc.,~~ that provides indication of fuel clad integrity [Ref. 2]. This EAL threshold is based on a valid RCS Letdown Line [1(2) R-9] alarm or portable radiation monitoring equipment indicating RCS activity is at or about the Technical Specification allowable limit.

~~EAL #2~~SU4.2 *addresses coolant samples exceeding coolant* T~~t~~*echnical* S~~s~~*pecifications* ~~for iodine spike~~[Ref. 1]. Escalation of this IC to the Alert level is via the Fission Product Barrier Degradation Monitoring ICs.

Although the Technical Specification is applicable for Power Operation, Startup and Hot Standby modes (when average reactor coolant temperature is GREATER THAN 500°F), it is appropriate that this EAL be applicable in all of Hot Standby and Hot Shutdown modes, as it indicates a potential degradation in the level of safety of the plant.
~~Though the referenced Technical Specification limits are mode dependent, it is appropriate that the EAL's be applicable in all modes, as they indicate a potential degradation in the level of safety of the plant. The companion IC to SU4 for the Cold Shutdown/Refueling modes is CU5.~~

PINGP Basis Reference(s):

1. Technical Specifications 3.4.17

2. USAR Section 10.2.3.3.7

SYSTEM MALFUNCTION

SU5

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

RCS Leakage.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency Action Levels:~~Emergency Action Levels: (SU5.1 or SU5.2)

SU5.1. Unidentified or pressure boundary leakage GREATER THAN 10 gpm.

SU5.2. Identified leakage GREATER THAN 25 gpm.

Basis:

This IC is included as a ~~NO~~UE because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. The 10 gpm value for the unidentified and pressure boundary leakage was selected as it is observable with normal control room indications. Lesser values must generally be determined through time-consuming surveillance tests (e.g., mass balances).

The EAL for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage. In either case, escalation of this IC to the Alert level is via Fission Product Barrier Degradation ICs.

PINGP Basis Reference(s):

None

SYSTEM MALFUNCTION

SU6

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of All Onsite or Offsite Communications Capabilities.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency Action Levels:~~Emergency Action Levels: (SU6.1 or SU6.2)

SU6.1. Loss of all Table C-1~~(site-specific list)~~ onsite communications capability affecting the ability to perform routine operations.

Table C-1 Onsite Communications Systems
• Sound Powered Phones
• Plant Paging System
• Plant Telephone Network
• Plant Radio System

SU6.2. Loss of all Table C-2~~(site-specific list)~~ offsite communications capability.

Table C-2 Offsite Communications Systems
• Plant Telephone Network
• Plant Radio System (dedicated offsite channels)
• ENS Network

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities. The loss of offsite communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

The availability of one method of ordinary offsite communications is sufficient to inform state and local authorities of plant problems. This EAL is intended to be used only when extraordinary means (e.g., relaying of information from radio transmissions, individuals being sent to offsite locations, etc.) are being utilized to make communications possible.

~~Site-specific list for~~Table C-1 onsite communications loss ~~must~~ encompasses the loss of all means of routine communications (e.g., commercial telephones, sound powered phone systems, page party system (Gaitronics) and radios / walkie talkies).

~~Site-specific list for~~Table C-2 offsite communications loss ~~must~~ encompasses the loss of all means of communications with offsite authorities. This ~~should~~ includes the ENS, commercial telephone lines, telecopy transmissions, dedicated offsite radio channels, and dedicated phone systems.

PINGP Basis Reference(s):

1. PINGP Emergency Plan, Section 7.2

SU8

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Inadvertent Criticality.

Operating Mode Applicability:~~OPERATING MODE APPLICABILITY~~
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level: (SU8. 1~~-or SU8.2~~)

~~1. An UNPLANNED extended positive period observed on nuclear instrumentation.~~

SU8.~~2~~1. An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

Basis:

This IC addresses inadvertent criticality events. While the primary concern of this IC is criticality events that occur in Cold Shutdown or Refueling modes (NUREG 1449, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States), the IC is applicable in other modes in which inadvertent criticalities are possible. This IC indicates a potential degradation of the level of safety of the plant, warranting ~~an~~ ~~NO~~UE ~~Unusual Event~~ classification. This IC excludes inadvertent criticalities that occur during planned reactivity changes associated with reactor startups (e.g., criticality earlier than estimated). The Cold Shutdown/Refueling IC is CU8.

This condition can be identified using the ~~period monitors/~~startup rate monitor. The term "~~extended~~sustained" is used in order to allow exclusion of expected short term positive ~~periods/~~startup rates from planned control rod movements ~~for PWRs and BWRs (~~such as shutdown bank withdrawal~~ for PWRs)~~. These short term positive ~~periods/~~startup rates are the result of the increase in neutron population due to subcritical multiplication.

Escalation would be by the Fission Product Barrier Matrix, as appropriate to the operating mode at the time of the event, or by Emergency Director Judgment.

Note: This EAL is SU8 following SU6. SU7 is not used in NEI 99-01 Revision 4 and that convention is carried forward here.

PINGP Basis Reference(s):

None

Initiating Condition -- ALERT

Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor ~~Scram~~ Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual ~~Scram~~ Trip Was Successful.

Operating Mode Applicability: Power Operation
Startup
Hot Standby

~~Example Emergency~~Emergency Action Level:

SA2.1. Indication(s) exist that a Reactor Protection System setpoint was exceeded

AND

RPS automatic trip did not reduce power to LESS THAN 5%

AND

Any of the following operator actions are successful in reducing power to LESS THAN 5%:

Manual Control Board:

- Reactor Trip
- AMSAC/DSS Actuation
- Turbine Trip

~~Indication(s) exist that indicate that reactor protection system setpoint was exceeded and automatic scram did not occur, and a successful manual scram occurred.~~

Basis:

This condition indicates failure of the automatic protection system to ~~scram~~ trip the reactor. This condition is more than a potential degradation of a safety system in that a front line automatic protection system did not function in response to a plant transient and thus the plant safety has been compromised, and design limits of the fuel may have been exceeded. An Alert is indicated because conditions exist that lead to potential loss of fuel clad or RCS. Reactor protection system setpoint being exceeded, rather than limiting safety system setpoint being exceeded, is specified here because failure of the automatic protection system is the issue. A manual ~~scram~~ trip is any set of actions by the reactor operator(s) at the reactor control console which causes control rods to be rapidly inserted into the core and brings the reactor subcritical (e.g., reactor trip button~~, Alternate Rod Insertion~~). Failure of manual ~~scram~~ trip would escalate the event to a Site Area Emergency.

Following a successful reactor trip, reactor power promptly drops to only a few percent of nominal, and then decays away to a level some 8 decades less. Reactor power levels resulting from radioactive fission product decay are never more than a few percent of nominal power and also lower in time. Heat removal safety systems are sized to remove only decay heat and not significant core power. Reactor power levels at or above 5% (in a core that is supposed to be shutdown) are considered an extreme challenge to the Fuel Cladding barrier and warrant a Critical Safety Function Status Tree (CSFST) Subcriticality-Red path priority. The setpoint has been chosen because it is because it is clearly readable on the power range meters. Reactor power levels in the power range are indicated on PR instruments N41, N42, N43, and N44. [Ref. 3]

A reactor trip can result from a turbine trip. Manual trip also includes manual actuation of the AMSAC/DSS logic. Failure of the manual trip would escalate the event to a Site Area Emergency under EAL SS2.1.

Note: This EAL is SA2 following SU8. SA1 is not used in NEI 99-01 Revision 4 and that convention is carried forward here.

PINGP Basis Reference(s):

1. E-0 Reactor Trip or Safety Injection
2. ES-0.1 Reactor Trip Response
3. F-0.1 Subcriticality

SYSTEM MALFUNCTION

SA4

Initiating Condition -- ALERT

UNPLANNED Loss of Most or All Safety System Annunciation or Indication in Control Room With Either (1) a SIGNIFICANT TRANSIENT in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SA4.1. UNPLANNED loss of most or all ~~(site-specific)~~ annunciators or indicators associated with safety systems for ~~greater than~~GREATER THAN 15 minutes

- Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV, and ERCS Alarms

AND

Either of the following: (a or b)

a. A SIGNIFICANT TRANSIENT is in progress.

OR

b. Compensatory non-alarming indications are unavailable.

Basis:

This IC and its associated EAL are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment during a transient. Recognition of the availability of computer based indication equipment is considered (e.g., SPDS, plant computer, etc.) via the reference to Emergency Response Computer System (ERCS) alarms.

SIGNIFICANT TRANSIENT is an UNPLANNED event involving one or more of the following: (1) Automatic Turbine Runback >25% Reactor Power, (2) Load Rejection >25% Full Load, (3) Reactor Trip, (4) Safety Injection Actuation, or (5) Reactor Power Oscillations >10%.

~~Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.~~

~~Quantification of "Most" is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of~~

~~the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Supervisor be tasked with making a judgment decision as to whether additional personnel are required to provide increased monitoring of system operation.~~

The focus of the EAL is on annunciators. The plant design also provides redundant safety system and accident monitoring ~~It is further recognized that most the plant designs provides redundant safety system~~ indication powered from separate uninterruptable power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the ~~NO~~UE is based on SU2 "Inability to Reach Required Shutdown Within Technical Specification Limits."

The scope of annunciators and indicators for this EAL is all-inclusive, thus it includes those identified and used ~~Site-specificThe specified annunciators or indicators for this EAL must includes those identified~~ in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., area, process, and/or effluent rad monitors, etc.).

"Compensatory non-alarming indications" in this context includes computer based information (i.e., ERCS)~~such as SPDS~~. ~~This should include all computer systems available for this use depending on specific plant design and subsequent retrofits.~~ If both a major portion of the annunciation system and all computer monitoring are unavailable, the Alert is required.

Due to the limited number of safety systems in operation during cold shutdown, refueling and defueled modes, no IC is indicated during these modes of operation.

This Alert will be escalated to a Site Area Emergency if the operating crew cannot monitor the transient in progress.

Note: This EAL is SA4 following SA2. SA3 is not used in NEI 99-01 Revision 4 and that convention is carried forward here.

PINGP Basis Reference(s):

1. USAR Section 7.7.1
2. USAR Section 7.8.1

SYSTEM MALFUNCTION

SA5

Initiating Condition – ALERT

AC power capability to essential ~~busses~~buses reduced to a single power source for greater than 15 minutes such that any additional single failure would result in station blackout.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SA5.1. AC power capability to Safeguards Buses 15(25) and 16(26) reduced to only one of the following sources~~a single power source~~ for ~~greater than~~GREATER THAN 15 minutes

- CT-11
- CT-12
- 1RY
- 2RY
- Emergency Diesels D1 (D5) and D2 (D6)

AND

Any additional single failure will result in station blackout.

Basis:

This IC and the associated EALs are intended to provide an escalation from IC SU1, "Loss of All Offsite Power To Essential ~~Busses~~Buses for Greater Than 15 Minutes." The condition indicated by this IC is the degradation of the offsite and onsite power systems such that any additional single failure would result in a station blackout. This condition could occur due to a loss of offsite power with a concurrent failure of one emergency diesel generator (EDG) to supply power to its emergency busses. Another related condition could be the ~~loss of all offsite power and loss of onsite emergency diesels with only one train of emergency busses being backfed from the unit main generator, or the~~ loss of onsite ~~emergency diesel~~EDGs with only one train of ~~emergency~~essential ~~busses~~buses being ~~back~~fed from offsite power.

PINGP Essential/emergency Buses are "Safeguards" Buses 15(25) and 16(26).

Offsite power sources include any of the following:

CT-11
CT-12
1RY
2RY

~~The~~ EDGs power sources are:

- D1 (D5)
- D2 (D6)

Safeguards Bus 15 (16) can be cross tied to Safeguards Bus 25 (26) as a power supply.

The subsequent loss of ~~this~~ the single remaining power source would escalate the event to a Site Area Emergency in accordance with IC SS1, "Loss of All Offsite and Loss of All Onsite AC Power to Essential ~~Busses~~Buses."

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. USAR Section 8.4.4
5. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

~~At multi-unit stations, the EALs should allow credit for operation of installed design features, such as cross-ties or swing diesels, provided that abnormal or emergency operating procedures address their use. However, these stations must also consider the impact of this condition on other shared safety functions in developing the site specific EAL.~~

SYSTEM MALFUNCTION

SS1

Initiating Condition – SITE AREA EMERGENCY

Loss of All Offsite Power and Loss of All Onsite AC Power to Essential ~~Busses~~Buses.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SS1.1. Loss of all offsite power to Safeguards Buses 15(25) and 16(26) ~~power to (site-specific) transformers.~~

AND

Failure of all ~~(site-specific)~~ emergency generators to supply power to emergency Busses15(25) and 16(26).

AND

Failure to restore power to at least one emergency Bus within 10 ~~(site-specific)~~ minutes from the time of loss of both offsite and onsite AC power.

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power will cause core uncovering and loss of containment integrity, thus this event can escalate to a General Emergency. This EAL is indicated by the loss of all offsite and onsite AC power to the 4.16KV safeguards (essential) buses. The 10-minute time duration was selected based on the summary for PINGP procedure 1 ECA-0.0 "Loss of All Safeguards AC Power", and associated Station Black Out Coping Study, which concludes that AC power can be supplied to one safeguards bus within 10 minutes to preclude RCS degradation. This 10-minute time duration excludes transient or momentary power loses.
~~The 15-minute(site specific) time duration should be selected to excludes transient or momentary power losses, but should not exceed 15 minutes.~~

PINGP "Essential" Buses are "Safeguards" Buses 15(25) and 16(26). PINGP emergency diesel generators (EDG) D1 (5) and D2 (6) are the "emergency generators".

No credit is provided for restoration of power to a non-affected unit bus. However, Safeguards Bus 15 (16) can be cross tied to Safeguards Bus 25 (26) as a power supply.

Escalation to General Emergency is via Fission Product Barrier Degradation or IC SG1, "Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power."

Consideration should be given to operable loads necessary to remove decay heat or provide Reactor Vessel makeup capability when evaluating loss of AC power to essential ~~busses~~buses. Even though an essential bus may be energized, if necessary loads (i.e., loads that if lost would inhibit decay heat removal capability or Reactor Vessel makeup capability) are not operable on the energized bus then the bus ~~should~~ is not ~~be~~ considered operable. If this bus was the only energized bus then a Site Area Emergency per SS1 should be declared.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. USAR Section 8.4.4
5. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

SYSTEM MALFUNCTION

SS2

Initiating Condition -- SITE AREA EMERGENCY

Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor ~~Scram~~ Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual ~~Scram~~ Trip Was NOT Successful.

Operating Mode Applicability: Power Operation
Startup

~~Example Emergency~~Emergency Action Level:

SS2.1. ~~Indication(s) exist that automatic and manual scram were not successful.~~Indication(s) exist that automatic and manual trip were NOT successful in reducing power to LESS THAN 5%.

Basis:

Automatic and manual ~~scram~~ trip are not considered successful if action away from the reactor control console was required to ~~scram~~ trip the reactor.

Under these conditions, the reactor is producing more heat than the maximum decay heat load for which the safety systems are designed. A Site Area Emergency is indicated because conditions exist that lead to imminent loss or potential loss of both fuel clad and RCS. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response. Escalation of this event to a General Emergency would be via Fission Product Barrier Degradation or Emergency Director Judgment ICs.

Automatic or manual reactor trip is considered successful if manual actions taken at the Control Board: Reactor Trip, AMSAC/DSS Actuation, or Turbine Trip (a reactor trip can result from a turbine trip), result in reducing reactor power less than 5%. Reactor power levels in the power range are indicated on PR instruments N41, N42, N43, and N44.

PINGP Basis Reference(s):

1. E-0 Reactor Trip or Safety Injection
2. ES-0.1 Reactor Trip Response

SYSTEM MALFUNCTION

SS3

Initiating Condition – SITE AREA EMERGENCY

Loss of All Vital DC Power.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SS3.1. Loss of aAll ~~Vital~~ Safeguards DC pPower based on LESS THAN 112 VDC on 125VDC Panel 11(21) and Panel 12(22)~~125 VDC buses~~ for ~~greater than~~GREATER THAN 15 minutes.

Basis:

Loss of all DC power compromises ability to monitor and control plant safety functions. Prolonged loss of all DC power will cause core uncovering and loss of containment integrity when there is significant decay heat and sensible heat in the reactor system. Escalation to a General Emergency would occur by Abnormal Rad Levels/Radiological Effluent, Fission Product Barrier Degradation, or Emergency Director Judgment ICs. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

The configurations of the DC Power Supply Systems for both Units are shown in USAR Figures 8.5-1a, -1b, -2a and -2b. Each Unit has two trains, with one battery and one battery charger serving each train. 125 VDC Panels 11 and 12 serve Unit 1 and 125 VDC Panels 21 and 22 serve Unit 2.

Each of the two station batteries per Unit has been sized to carry expected shutdown loads following a plant trip, and a loss of AC battery charging power for a period of 1 hour without battery terminal voltage falling below the minimum required voltage. Depending on which DC bus, the minimum required voltage ranges from approximately 109.5 to 111.5 VDC, based on site specific calculations to assure that the needed load voltage of is available. The LESS THAN 112 VDC value was chosen as a limiting value encompassing the four DC busses and incorporates a minimum margin of .5 VDC. Each of the four battery chargers has been sized to recharge its associated partially discharged battery within 24 hours, while carrying its normal load.

Receipt of Annunciator 47024-1201, 11 DC PANEL UNDERVOLTAGE, or Annunciator 47024-1204, 12 DC PANEL UNDERVOLTAGE, may be indicative of DC bus voltage degradation.

PINGP “Vital” DC power is “Safeguards” DC power.

PINGP Basis Reference(s):

1. USAR Section 8.5
2. USAR Figure 8.5-1A & 8.5-1B
3. USAR Figure 8.5-2A & 8.5-2B
4. Technical Specifications 3.8.9
5. 1C20.9 AOP1 Loss of Unit 1 Train "A" DC
6. 1C20.9 AOP2 Loss of Unit 1 Train "B" DC
7. 2C20.9 AOP1 Loss of Unit 2 Train "A" DC
8. 2C20.9 AOP2 Loss of Unit 2 Train "B" DC
9. Engineering Calculations 91-02-11 Rev 0, 91-02-12 Rev 1, 91-02-21 Rev 0, 91-02-22 Rev 0

Initiating Condition -- SITE AREA EMERGENCY

Complete Loss of Heat Removal Capability.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SS4.1. Loss of core cooling and heat sink ~~(PWR)~~ as indicated by conditions that require entry into:

a. Core Cooling - RED path.

AND

b. Heat Sink - RED path.

~~SS4.1. Heat Capacity Temperature Limit Curve exceeded (BWR).~~

Basis:

This EAL addresses complete loss of functions, including ultimate heat sink, required for hot shutdown with the reactor at pressure and temperature. Reactivity control is addressed in other EALs. Accordingly, the "Red Path" EOP conditions for Core Cooling and Heat Sink are the EAL criteria for this condition. ~~For BWRs the loss of heat removal function is indicated by the Heat Removal Capability Temperature Limit Curve being exceeded.~~

Under these conditions, there is an actual major failure of a system intended for protection of the public. Thus, declaration of a Site Area Emergency is warranted. Escalation to General Emergency would be via Abnormal Rad Levels / Radiological Effluent, Emergency Director Judgment, or Fission Product Barrier Degradation ICs.

PINGP Basis Reference(s):

1. F-0.2 Core Cooling
2. F-0.3 Heat Sink

Initiating Condition – SITE AREA EMERGENCY

Inability to Monitor a SIGNIFICANT TRANSIENT in Progress.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SS6.1. Loss of most or all ~~(site-specific)~~ annunciators associated with safety systems

- Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV, and ERCS Alarms

AND

A SIGNIFICANT TRANSIENT in progress.

AND

~~b.~~ Compensatory non-alarming indications are unavailable.

AND

~~c.~~ Indications needed to monitor the ability to shut down the reactor, maintain the core cooled, maintain the reactor coolant system intact, and maintain containment intact~~monitor (site-specific) safety functions~~ are unavailable.

~~AND~~

~~d. SIGNIFICANT TRANSIENT in progress.~~

Basis:

This IC and its associated EAL are intended to recognize the inability of the control room staff to monitor the plant response to a transient. A Site Area Emergency is considered to exist if the control room staff cannot monitor safety functions needed for protection of the public.

SIGNIFICANT TRANSIENT is an UNPLANNED event involving one or more of the following: (1) Automatic Turbine Runback >25% Reactor Power, (2) Load Rejection >25% Full Load, (3) Reactor Trip, (4) Safety Injection Actuation, or (5) Reactor Power Oscillations >10%.

~~(Site-specific) annunciators for this EAL should be limited to those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., rad monitors, etc.)~~

"Compensatory non-alarming indications" in this context includes computer based information ~~such as SPDS~~(i.e., ERCS). This should include all computer systems available for this use depending on specific plant design and subsequent retrofits.

~~(Site specific) i~~Indications needed to monitor safety functions necessary for protection of the public ~~must~~ include control room indications, computer generated indications and dedicated annunciation capability. The specific indications ~~should be~~are those used to ~~determine such functions as~~monitor the ability to shut down the reactor, maintain the core cooled, to maintain the reactor coolant system intact, and to maintain containment intact.

"Planned" and "UNPLANNED" actions are not differentiated since the loss of instrumentation of this magnitude is of such significance during a transient that the cause of the loss is not an ameliorating factor.

The scope of annunciators considered for determining "most or all" is all-inclusive. Quantification of "Most" is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Supervisor be tasked with making a judgment decision as to whether additional personnel are required to provide increased monitoring of system operation.

However, annunciators for this EAL should be limited to those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., rad monitors, etc.). Escalation to a Site Area classification is not appropriate if annunciators for these functions and indications needed to monitor safety functions remain operational. It is not intended that plant personnel perform a detailed analysis of the indication that has been lost, but consider the availability of these monitoring functions in determining the severity of the condition.

Note: This EAL is SS6 following SS4. SS5 is not used in NEI 99-01 Revision 4 and that convention is carried forward here.

PINGP Basis Reference(s):

1. <u>USAR Section 7.7.1</u>
2. <u>USAR Section 7.8.1</u>

SYSTEM MALFUNCTION

SG1

Initiating Condition -- GENERAL EMERGENCY

Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power to Essential ~~Busses~~Buses.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

~~Example Emergency~~Emergency Action Level:

SG1.1. Loss of all offsite power to ~~(site-specific) transformers~~ Safeguards Buses 15(25) and 16(26)

AND

Failure of ~~(site-specific)~~ all emergency diesel generators to supply power to Safeguards Buses 15(25) and 16(26)

AND

Either of the following: (a or b)

a. Restoration of at least one Safeguards Bus within ~~(site-specific)~~4 hours is not likely

OR

b. ~~(Site-Specific) Indication of c~~Continuing degradation of core cooling based on Fission Product Barrier monitoring~~.~~ as indicated by conditions that require entry into Core Cooling-RED or ORANGE path

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power will lead to loss of fuel clad, RCS, and containment. The ~~(site-specific)~~4 hours to restore AC power ~~can be~~is based on ~~a~~ the site blackout coping analysis performed in conformance with 10 CFR 50.63 and Regulatory Guide 1.155, "Station Blackout,"~~ as available~~. Appropriate allowance for offsite emergency response including evacuation of surrounding areas should be considered. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response.

This IC is specified to assure that in the unlikely event of a prolonged station blackout, timely recognition of the seriousness of the event occurs and that declaration of a General Emergency occurs as early as is appropriate, based on a reasonable assessment of the event trajectory.

PINGP "Essential" Buses are "Safeguards" Buses 15(25) and 16(26). PINGP emergency diesel generators (EDG) D1 (5) and D2 (6) are the "emergency generators".

No credit is provided for restoration of power to a non-affected unit bus. However, Safeguards Bus 15 (16) can be cross tied to Safeguards Bus 25 (26) as a power supply.

The likelihood of restoring at least one emergency bus should be based on a realistic appraisal of the situation since a delay in an upgrade decision based on only a chance of mitigating the event could result in a loss of valuable time in preparing and implementing public protective actions.
In addition, under these conditions, fission product barrier monitoring capability may be degraded. Although it may be difficult to predict when power can be restored, it is necessary to give the Emergency Director a reasonable idea of how quickly (s)he may need to declare a General Emergency based on two major considerations:

1. Are there any present indications that core cooling is already degraded to the point that Loss or Potential Loss of Fission Product Barriers is imminent? (Refer to Table ~~s-3 and 4~~F-1, Fission Product Barrier EALs, for more information.)

2. If there are no present indications of such core cooling degradation, how likely is it that power can be restored in time to assure that a loss of two barriers with a potential loss of the third barrier can be prevented?

Thus, indication of continuing core cooling degradation must be based on Fission Product Barrier monitoring with particular emphasis on Emergency Director judgment as it relates to imminent Loss or Potential Loss of fission product barriers and degraded ability to monitor fission product barriers.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. USAR Section 8.4.4
5. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power
6. F-0.2 Core Cooling
7. FR-C.1 Response to Inadequate Core Cooling
8. FR-C.2 Response to Degraded Core Cooling

SYSTEM MALFUNCTION

SG2

Initiating Condition – GENERAL EMERGENCY

Failure of the Reactor Protection System to Complete an Automatic ~~Scram~~ Trip and Manual ~~Scram~~ Trip was NOT Successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core.

Operating Mode Applicability: Power Operation
Startup

~~Example Emergency~~Emergency Action Level:

SG2.1. Indication(s) exist that automatic and manual trip were NOT successful in reducing power to LESS THAN 5%.

~~Indications exist that automatic and manual scram were not successful.~~

AND

Either of the following: (a or b)

—a. ~~Indication(s) exists that the c~~Core cooling is extremely challenged as indicated by conditions that require entry into Core Cooling - RED path.

OR

—b. ~~Indication(s) exists that h~~Heat removal is extremely challenged as indicated by conditions that require entry into Heat Sink - RED path.

Basis:

Automatic and manual ~~scram~~ trip are not considered successful if action away from the reactor control console is required to ~~scram~~ trip the reactor.

Under the conditions of this IC and its associated EALs, the efforts to bring the reactor subcritical have been unsuccessful and, as a result, the reactor is producing more heat than the maximum decay heat load for which the safety systems were designed. Although there are capabilities away from the reactor control console, such as emergency boration, driving control rods, locally tripping control rod power supplies, or local turbine trip (which may result in a reactor trip) ~~in PWRs, or standby liquid control in BWRs~~, the continuing temperature rise indicates that these capabilities are not effective even if outplant actions reduced power to LESS THAN 5%. This situation could be a precursor for a core melt sequence.

The combination of reactor power greater than 5% and either Core Cooling-RED path or Heat Sink-RED path signals the inability to initially remove heat during the early stages of this sequence.

- If CET readings exceed the Core Cooling-RED path thresholds, a condition indicative of a severe challenge to heat removal exists, resulting in core exit superheating and core uncovery. This is defined to be a loss of the Fuel Cladding barrier.

- If auxiliary feedwater flow is insufficient to remove the amount of heat required by design from at least one steam generator, the ultimate heat sink function is under extreme challenge. This condition addresses loss of functions required for hot shutdown with the reactor at pressure and temperature and thus a potential loss of the RCS barrier.

~~For PWRs, t~~The extreme challenge to the ability to cool the core is intended to mean that the core exit temperatures are at or approaching 1200 degrees F or that the reactor vessel water level is below the top of active fuel. ~~For plants using CSFSTs, t~~This EAL equates to a Core Cooling RED condition~~ and an entry into function restoration procedure FR-S.1. For BWRs, the extreme challenge to the ability to cool the core is intended to mean that the reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level as described in the EOP bases.~~

Another consideration is the inability to initially remove heat during the early stages of this sequence. ~~For PWRs, i~~If emergency feedwater flow is insufficient to remove the amount of heat required by design from at least one steam generator, an extreme challenge should be considered to exist. ~~For plants using CSFSTs, t~~This EAL equates to a Heat Sink RED condition.~~ For BWRs, considerations include inability to remove heat via the main condenser, or via the suppression pool or torus (e.g., due to high pool water temperature).~~

In the event either of these challenges exist at a time that the reactor has not been brought below the power associated with the safety system design (typically 3 to 5% power) a core melt sequence exists. In this situation, core degradation can occur rapidly. For this reason, the General Emergency declaration is intended to be anticipatory of the fission product barrier matrix declaration to permit maximum offsite intervention time.

Automatic or manual reactor trip is considered successful if actions taken by Manual Control Board Reactor Trip, AMSAC/DSS Actuation, or Turbine Trip (a reactor trip can result from a turbine trip) result in reducing reactor power less than 5%. Reactor power levels in the power range are indicated on PR instruments N41, N42, N43, and N44. Automatic and manual trips are not considered successful if action away from the Control Room is required to trip the reactor.

PINGP Basis Reference(s):

1. E-0 Reactor Trip or Safety Injection
2. ES-0.1 Reactor Trip Response
3. F-0.1 Subriticality
4. F-0.2 Core Cooling
5. F-0.3 Heat Sink

ATTACHMENT 2

PROPOSED TECHNICAL BASIS DOCUMENT

Emergency Action Level Technical Bases Document

Table of Contents

LIST OF TABLES

ACRONYMS

AC	Alternating Current
ATWS	Anticipated Transient Without Scram
CC	Component Cooling Water
CDE	Committed Dose Equivalent
CFR	Code of Federal Regulations
CL	Cooling Water
CTMT	Containment
CSF	Critical Safety Function
CSFST	Critical Safety Function Status Tree
DC	Direct Current
DHR	Decay Heat Removal
DOT	Department of Transportation
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
ECL	Emergency Classification Level
EDG	Emergency Diesel Generator
ED	Emergency Director
EOF	Emergency Operations Facility
EOP	Emergency Operating Procedure
EPA	Environmental Protection Agency
EPIP	Emergency Plan Implementing Procedure
ERCS	Emergency Response Computer System
EPRI	Electric Power Research Institute
ESF	Engineered Safeguards Feature
ESW	Emergency Service Water
FEMA	Federal Emergency Management Agency
GE	General Emergency
IC	Initiating Condition
IDLH	Immediately Dangerous to Life and Health
IPEEE	Individual Plant Examination of External Events (Generic Letter 88-20)
ISFSI	Independent Spent Fuel Storage Installation
LCO	Limiting Condition of Operation

LER	Licensee Event Report
LFL	Lower Flammability Limit
LOCA	Loss of Coolant Accident
MSIV	Main Steam Isolation Valve
MSL	Mean Sea Level
mR	milliRem
MW	Megawatt
NEI	Nuclear Energy Institute
NESP	National Environmental Studies Project
NRC	Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
NUMARC	Nuclear Management and Resources Council
OBE	Operating Basis Earthquake
ODCM	Offsite Dose Calculation Manual
PAG	Protective Action Guide
PINGP	Prairie Island Nuclear Generating Plant
PRA	Probabilistic Risk Assessment
PWR	Pressurized Water Reactor
PSIG	Pounds per Square Inch Gauge
R	Roentgen
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RVLIS	Reactor Vessel Level Indicating System
SAE	Site Area Emergency
SG	Steam Generator
SI	Safety Injection
SFP	Spent Fuel Pool
SRO	Senior Reactor Operator
TEDE	Total Effective Dose Equivalent
TOAF	Top of Active Fuel
TSC	Technical Support Center
UE	Notification Of Unusual Event

USAR	Updated Safety Analysis Report
WE	Westinghouse Electric
WOG	Westinghouse Owners Group

1. PURPOSE

This document provides the detailed set of Emergency Action Levels (EALs) applicable to the Prairie Island Nuclear Generating Plant (PINGP) and the associated Technical Bases using the EAL development methodology found in NEI 99-01 Revision 4 [Ref. 2.1]. Personnel responsible for making emergency declarations may use this document as a technical reference and an aid in EAL interpretation.

The primary tool for determining the emergency classification level is the Emergency Action Level Matrix. The user of the Emergency Action Level Matrix may (but is not required to) consult the EAL Technical Basis Document in order to obtain additional information concerning the EALs under classification consideration.

2. REFERENCES

2.1 NEI 99-01 Revision 4, Methodology for Development of Emergency Action Levels

2.2 PINGP Technical Specifications Table 1.1-1

3. DISCUSSION

3.1 Background

EALs are the plant-specific indications, conditions or instrument readings that are utilized to classify emergency conditions defined in the PINGP Emergency Plan.

NEI 99-01 (NUMARC/NESP-007) Revision 4 represents the most recently NRC endorsed methodology per RG 1.101 Rev 4, "Emergency Planning and Preparedness for Nuclear Power Reactors." Enhancements over earlier revisions included:

- Consolidating the system malfunction initiating conditions and example emergency action levels which address conditions that may be postulated to occur during plant shutdown conditions.
- Addressing initiating conditions and example emergency action levels that fully address conditions that may be postulated to occur at permanently Defueled Stations and Independent Spent Fuel Storage Installations.

Using NEI 99-01 Rev. 4, PINGP conducted an EAL implementation upgrade project that produced the EALs discussed herein. While the upgraded EALs are site-specific, an objective of the project was to ensure to the extent possible EAL conformity and consistency between the NMC plant sites.

3.2 Key Definitions in EAL Methodology

The following definitions apply to the generic EAL methodology:

EMERGENCY CLASS: One of a minimum set of names or titles, established by the Nuclear Regulatory Commission (NRC), for grouping of normal nuclear power plant conditions according to (1) their relative radiological seriousness, and (2) the time sensitive onsite and off site radiological emergency preparedness actions necessary to respond to such conditions. The existing radiological emergency classes, in ascending order of seriousness, are called:

- Notification of Unusual Event (UE)
- Alert
- Site Area Emergency (SAE)
- General Emergency (GE)

Section 3.3 provides further discussion of the emergency classes.

INITIATING CONDITION (IC): One of a predetermined subset of nuclear power plant conditions when either the potential exists for a radiological emergency, or such an emergency has occurred.

- An IC is an emergency condition which sets it apart from the broad class of conditions that may or may not have the potential to escalate into a radiological emergency.
- It can be a continuous, measurable function that is outside technical specifications, such as elevated RCS temperature or falling reactor coolant level (a symptom).
- It also encompasses occurrences such as FIRE (an event) or reactor coolant pipe failure (an event or a barrier breach).

EMERGENCY ACTION LEVEL (EAL): A predetermined, site-specific, observable threshold for a plant Initiating Condition that places the plant in a given emergency class. An EAL can be: an instrument reading; an equipment status indicator; a measurable parameter (onsite or offsite); a discrete, observable event; results of analyses; entry into specific emergency operating procedures; or another phenomenon which, if it occurs, indicates entry into a particular emergency class.

- There are times when an EAL will be a threshold point on a measurable continuous function, such as a primary system coolant leak that has exceeded technical specifications.
- At other times, the EAL and the IC will coincide, both identified by a discrete event that places the plant in a particular emergency class.

3.3 Recognition Categories

ICs and EALs are grouped in one of several categories. This classification scheme incorporates symptom-based, event-based, and barrier-based ICs and EALs.

- R - Abnormal Rad Levels/Radiological Effluent
- C - Cold Shutdown/ Refueling System Malfunction
- E - Independent Spent Fuel Storage Installation (ISFSI)
- F - Fission Product Barrier Degradation
- H - Hazards
- S - System Malfunction

Some recognition categories are further divided into one or more subcategories depending on the types and number of plant conditions that dictate emergency classifications. An EAL may or may not exist for each subcategory at all four classification levels. Similarly, more than one EAL may exist for a subcategory in a given emergency classification when appropriate (i.e., no EAL at the General Emergency level but three EALs at the Unusual Event level).

3.4 Emergency Class Descriptions

There are three considerations related to the emergency classes. These are:

- The potential impact on radiological safety, either currently known or as can be reasonably projected.
- How far the plant is beyond its predefined design, safety and operating envelopes.
- Whether or not conditions that threaten health are expected to be confined within the site boundary.

The ICs deal explicitly with radiological safety affect by escalating from levels corresponding to releases within regulatory limits to releases beyond Environmental Protection Agency (EPA) Protective Action Guideline (PAG) plume exposure levels.

NOTIFICATION OF UNUSUAL EVENT: Events are in process or 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.

- Potential degradation of the level of safety of the plant is indicated primarily by exceeding plant technical specification Limiting Condition of Operation (LCO) allowable action statement time for achieving required mode change.
- Precursors of more serious events may be included because precursors represent a potential degradation in the level of safety of the plant.
- Minor releases of radioactive materials are included. In this emergency class, however, releases do not require monitoring or offsite response (e.g., dose consequences of less than 10 millirem).

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.

SITE AREA EMERGENCY: Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

- The discriminator (threshold) between Site Area Emergency and General Emergency is whether or not the EPA PAG plume exposure levels are expected to be exceeded outside the site boundary.
- This threshold, in addition to dynamic dose assessment considerations discussed in the EAL guidelines, clearly addresses NRC and offsite emergency response agency concerns as to timely declaration of a General Emergency.

GENERAL EMERGENCY: Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

- The bottom line for the General Emergency is whether evacuation or sheltering of the general public is required based on EPA PAGs and, therefore, should be interpreted to include radionuclide release regardless of cause.
- To better assure timely notification, EALs in this category are primarily expressed in terms of plant function status, with secondary reliance on dose projection. In terms of fission product barriers, loss of two barriers with loss or potential loss of the third barrier constitutes a General Emergency.

3.5 Operating Mode Applicability

Technical Specifications [Ref. 2.2] provides definitions for the following operating modes:

1 Power Operation

K_{eff} GREATER THAN OR EQUAL TO 0.99 and rated thermal power GREATER THAN 5%.

2 Startup

K_{eff} GREATER THAN OR EQUAL TO 0.99 and rated thermal power LESS THAN OR EQUAL TO 5%.

3 Hot Standby

K_{eff} LESS THAN 0.99 and average reactor coolant temperature (Tavg) GREATER THAN OR EQUAL TO 350°F.

4 Hot Shutdown

K_{eff} LESS THAN 0.99 and average reactor coolant temperature (Tavg) LESS THAN 350°F AND GREATER THAN 200°F with all reactor vessel head closure bolts fully tensioned.

5 Cold Shutdown

K_{eff} LESS THAN 0.99 and average reactor coolant temperature (Tavg) LESS THAN OR EQUAL TO 200°F with all reactor vessel head closure bolts fully tensioned.

6 Refueling

One or more reactor vessel head closure bolts less than fully tensioned.

In addition to the Technical Specification operating modes, NEI 99-01 [Ref. 2.1] defines the following additional mode:

D Defueled

All reactor fuel removed from Reactor Vessel (full core off load during refueling or extended outage)

The plant operating mode that exists at the time that the event occurs (prior to any protective system or operator action is initiated in response to the condition) should be compared to the mode applicability of the EALs. If a lower or higher plant operating mode is reached before the emergency classification is made, the declaration shall be based on the mode that existed at the time the event occurred.

Recognition categories are associated with the operating modes listed in the following matrix:

	Recognition Category					
Mode	R	C	E	F	H	S
1 - Power Operations	X			X	X	X
2 - Startup	X			X	X	X
3 - Hot Standby	X			X	X	X
4 - Hot Shutdown	X			X	X	X
5 - Cold Shutdown	X	X			X	
6 - Refueling	X	X			X	

	Recognition Category					
Mode	R	C	E	F	H	S
D - Defueled	X	X			X	
N/A			X			

3.6 Fission Product Barriers

Many of the EALs derived from the NEI methodology are fission product barrier based. That is, the conditions that define the EALs are based upon loss of or potential loss to one or more of the three fission product barriers. "Loss" and "potential loss" signify the relative damage and threat of damage to the barrier. "Loss" means the barrier no longer assures containment of radioactive materials and "potential loss" means imminent loss of the barrier.

The primary fission product barriers are:

- Fuel Cladding (FC): Zirconium tubes which house the ceramic uranium oxide pellets along with the end plugs which are welded into each end of the fuel rods comprise the FC barrier.

- Reactor Coolant System (RCS): The reactor vessel shell, vessel head, vessel nozzles and penetrations and all primary systems directly connected to the reactor vessel up to the first containment isolation valve comprise the RCS barrier.

- Containment (CTMT): The vapor containment structure and all isolation valves required to maintain containment integrity under accident conditions comprise the Containment barrier.

3.7 Emergency Classification Based on Fission Product Barrier Degradation

The following criteria are the bases for event classification related to fission product barrier loss or challenge:

- Notification of Unusual Event:

  Any loss or any potential loss of Containment

- Alert:

  Any loss or any potential loss of either Fuel Cladding or RCS

- Site Area Emergency:

  Loss or potential loss of any two barriers

- General Emergency:

Loss of any two barriers and loss or potential loss of third barrier

3.8 EAL Relationship to EOPs and Critical Safety Function Status

Where possible, the EALs have been made consistent with and utilize the conditions defined in the PINGP Critical Safety Function Status Trees (CSFSTs). While the symptoms that drive operator actions specified in the CSFSTs are not indicative of <u>all</u> possible conditions which warrant emergency classification, they define the symptoms, independent of initiating events, for which reactor plant safety and/or fission product barrier integrity are threatened. Where these symptoms are clearly representative of one of the NEI Initiating Conditions, they have been utilized as an EAL. This permits rapid classification of emergency situations based on plant conditions without the need for additional evaluation or event diagnosis. Although some of the EALs presented here are based on conditions defined in the CSFSTs, classification of emergencies using these EALs is not dependent upon Emergency Operating Procedures (EOP) entry or execution. The EALs can be utilized independently or in conjunction with the EOPs.

3.9 Symptom Based vs. Event Based Approach

To the extent possible, the EALs are symptom based. That is, the action level is defined by values of key plant operating parameters that identify emergency or potential emergency conditions. This approach is appropriate because it allows the full scope of variations in the types of events to be classified as emergencies. But, a purely symptom based approach is not sufficient to address all events for which emergency classification is appropriate. Particular events to which no predetermined symptoms can be ascribed have also been utilized as EALs since they may be indicative of potentially more serious conditions not yet fully realized.

Category R - Abnormal Rad Levels/Radiological Effluent and Category F - Fission Product Barrier Degradation are primarily symptom-based. The symptoms are indicative of actual or potential degradation of either fission product barriers or personnel safety.

Other categories tend to be event-based. For example, System Malfunctions are abnormal and emergency events associated with vital plant system failures, while Hazards are those non-plant system related events that have affected or may affect plant safety.

3.10 Treatment of Multiple Units and Emergency Class Upgrading

The emergency classification is based on the highest EAL reached for the site. For example, two Alerts remain in the Alert classification. Or for an Alert and a Site Area Emergency, a Site Area Emergency is the required classification.

Since PINGP is a dual-unit plant, emergency class upgrading must consider the effects of a loss of a common system on the other unit. For example, the control panels for both units share the same room. Thus, control room evacuation most likely would affect both units. There are a number of other systems and functions which may be shared. This must be considered in the emergency class declaration.

3.11 Emergency Class Downgrading

Another important aspect of usable EAL guidance is the consideration of what to do when the risk posed by an emergency is clearly decreasing.

It is recommended that a combination approach involving recovery from General Emergencies and some Site Area Emergencies and termination from UEs, Alerts, and certain Site Area Emergencies causing no long-term plant damage. Downgrading to lower emergency classes adds notifications but may have merit under certain circumstances.

3.12 Classifying Transient Events

For some events, the condition may be corrected before a declaration has been made. For example, an emergency classification is warranted when automatic and manual actions taken within the control room do not result in a required reactor trip. However, it is likely that actions taken outside of the control room will be successful, probably before the Emergency Director (ED) classifies the event. The key consideration in this situation is to determine whether or not further plant damage occurred while the corrective actions were being taken. In some situations, this can be readily determined, in other situations, further analyses (e.g., coolant sampling, may be necessary).

In general, observe the following guidance: Classify the event as indicated and terminate the emergency once assessment shows that there were no consequences from the event and other termination criteria are met. For example, a momentary event, such as an ATWS or an earthquake, requires declaration even though the condition may have been resolved by the time the declaration is made.

- An ATWS represents a failure of a front line safety system (RPS) designed to protect the health and safety of the public.
- The affect of an earthquake on plant equipment and structures may not be readily apparent until investigations are conducted.

There may be cases in which a plant condition that exceeded an EAL threshold was not recognized at the time of occurrence, but is identified well after the condition has occurred (e.g., as a result of routine log or record review) and the condition no longer exists. In these cases, an emergency should not be declared. Reporting requirements of 10 CFR 50.72 are applicable and the guidance of NUREG-1022, Rev. 1, Section 3 should be applied.

3.13 Imminent EAL Thresholds

Although the majority of the EALs provide very specific thresholds, the ED must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the ED, an imminent situation is at hand, the classification should be made as if the thresholds has been exceeded. While this is particularly prudent at the higher emergency classes (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all emergency classes. Explicit EALs, specifying use of ED judgment, are given in the Hazards, ISFSI and Fission Product Barrier Degradation categories.

4. TECHNICAL BASES INFORMATION

4.1 Recognition Category Organization

The technical bases of the EALs are provided under Recognition Categories R, C, E, F, H and S of this document. A table summarizing the Initiating Conditions introduces each category. The tables provide an overview of how the ICs are related under each emergency class. ICs within each category are listed according to classification (as applicable) in the following order: Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency.

For Recognition Category F, Table F-0 defines the emergency classifications associated with barrier loss and potential loss. Table F-1 lists the thresholds associated with the loss and potential loss of each fission product barrier. The presentation method shown for Table F-1 was chosen to clearly show the synergism among the EALs and to support more accurate dynamic assessments. Basis discussion of the thresholds immediately follows Table F-1.

4.2 Initiating Condition Structure

ICs in Recognition Categories R, C, E, H and S are structured in the following manner:

- Recognition Category Title
- IC Identifier:
  - First character identifies the category by letter (R, C, E, H and S)
  - Second character identifies the emergency classification level (U for Notification of Unusual Event, A for Alert, S for Site Area Emergency, and G for General Emergency)
  - Third character is the numerical sequence as given in Revision 4 of NEI 99-01 [Ref. 2.1] (e.g., SA2). Due to document revisions, certain NEI ICs have been deleted, leaving gaps in the numerical sequence.
- Emergency Class: Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency
- IC Description
- Operating Mode Applicability: Refers to the operating mode during which the IC/EAL is applicable
- Emergency Action Level(s): EALs are the conditions applicable to the criteria of the IC and are used to determine the need to classify an event/condition. If more than one EAL is applicable to an IC, emergency classification is required when any EAL within the IC reaches the EAL threshold. To clarify this intent, ICs with multiple EALs include a parenthetical phrase in the EAL title line, indicating that each constitutes an emergency classification. For example, the phrase "(RU1.1 or RU1.2)" indicates that either EAL is a Notification of Unusual Event.

- Basis: Provides information that explains the IC and EAL(s). Plant source document references are provided as needed to substantiate site-specific information included in the EALs and bases.

4.3 EAL Identification

The EAL identifier is the IC identifier followed by a period and sequence number (e.g., RU1.1, RU1.2, etc.). If only one EAL is assigned to an IC, the EAL is given the number one.

The primary purpose of the EAL identifier is to uniquely distinguish each classifiable condition. Secondary purposes are to assist location of an EAL within the EAL classification scheme and to announce the emergency classification level.

5. DEFINITIONS

In the ICs and EALs, selected words are in uppercase print. These words are defined terms. Definitions are provided below.

AFFECTING SAFE SHUTDOWN: Event in progress that has adversely affected functions that are necessary to bring the plant to and maintain it in the applicable HOT or COLD SHUTDOWN condition. Plant condition applicability is determined by Technical Specification LCOs in effect.

> Example 1: Event causes damage that results in entry into an LCO that requires the plant to be placed in HOT SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event is not "AFFECTING SAFE SHUTDOWN."

> Example 2: Event causes damage that results in entry into an LCO that requires the plant to be placed in COLD SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event is "AFFECTING SAFE SHUTDOWN."

BOMB refers to an explosive device suspected of having sufficient force to damage plant systems or structures.

CIVIL DISTURBANCE is a group of two or more persons violently protesting station operations or activities at the site.

CONFINEMENT BOUNDARY is the barrier(s) between areas containing radioactive substances and the environment.

CONTAINMENT CLOSURE is defined by EOP 1E-4, Core Cooling Following Loss of RHR Flow, Attachment I, Containment Closure Procedure. All Containment penetrations having one or more isolation valves closed and one door in each airlock penetration closed.

EXPLOSION is a rapid, violent, unconfined combustion, or catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.

EXTORTION is an attempt to cause an action at the station by threat of force.

FAULTED: In a steam generator, the existence of secondary side leakage that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE is combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute FIREs. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

HOSTAGE is a person(s) held as leverage against the station to ensure that demands will be met by the station.

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

IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH): A condition that either poses an immediate threat to life and health or an immediate threat of severe exposure to contaminants which are likely to have adverse delayed effects on health.

INTRUSION / INTRUDER is a person(s) present in a specified area without authorization. Discovery of a BOMB in a specified area is indication of INTRUSION into that area by a HOSTILE FORCE.

LOWER FLAMMABILITY LIMIT (LFL): The minimum concentration of a combustible substance that is capable of propagating a flame through a homogenous mixture of the combustible and a gaseous oxidizer.

NORMAL PLANT OPERATIONS: Activities at the plant site associated with routine testing, maintenance, or equipment operations, in accordance with normal operating or administrative procedures. Entry into abnormal or emergency operating procedures, or deviation from normal security or radiological controls posture, is a departure from NORMAL PLANT OPERATIONs.

PROTECTED AREA the area encompassing all controlled areas within the security protected area fence as shown in USAR Figure 1.1-3, Site Plan Prairie Island Security Fence.

RUPTURED: In a steam generator, existence of primary-to-secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection.

SABOTAGE is deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable. Equipment found tampered with or damaged due to malicious mischief may NOT meet the definition of SABOTAGE until this determination is made by security supervision.

SIGNIFICANT TRANSIENT is an UNPLANNED event involving one or more of the following: (1) Automatic Turbine Runback >25% Reactor Power, (2) Load Rejection >25% Full Load, (3) Reactor Trip, (4) Safety Injection Actuation, or (5) Reactor Power Oscillations >10%.

STRIKE ACTION is a work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on PINGP. The STRIKE ACTION must threaten to interrupt NORMAL PLANT OPERATIONs.

UNPLANNED: A parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

VALID: An indication, report, or condition is considered to be VALID when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator operability, the condition existence, or the report accuracy is removed. Implicit in this definition is the need for timely assessment.

VISIBLE DAMAGE is damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.

VITAL AREA is any area, normally within the PROTECTED AREA, which contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

6. EMERGENCY ACTION LEVEL BASES

Initiating Conditions (ICs), Emergency Action Levels (EALs) and EAL bases are provided in the following tables.

R - Abnormal Rad Levels/Radiological Effluent, Table R-0

C - Cold Shutdown / Refueling System Malfunction, Table C-0

E - Independent Spent Fuel Storage Installation (ISFSI), Table E-0

F - Fission Product Barrier Degradation, Table F-0

H – Hazards, Table H-0

S - System Malfunction, Table S-0

Table R-0

Recognition Category R

Abnormal Rad Levels / Radiological Effluent

INITIATING CONDITION MATRIX

UE		ALERT		SITE AREA EMERGENCY		GENERAL EMERGENCY	
RU1	**Any UNPLANNED Release of Gaseous or Liquid Radio-activity to the Environment that Exceeds Two Times the Offsite Dose Calculation Manual Specification for 60 Minutes or Longer.** *Op. Modes: All*	RA1	**Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Offsite Dose Calculation Manual Specification for 15 Minutes or Longer.** *Op. Modes: All*	RS1	**Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mRem TEDE or 500 mRem Thyroid CDE for the Actual or Projected Duration of the Release.** *Op. Modes: All*	RG1	**Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.** *Op. Modes: All*
RU2	**Unexpected Increase in Plant Radiation.** *Op. Modes: All*	RA3	**Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown** *Op. Modes: All*				
		RA2	**Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.** *Op. Modes: All*				

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RU1

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Offsite Dose Calculation Manual Specification for 60 Minutes or Longer.

Operating Mode Applicability: All

Emergency Action Levels: (RU1.1 or RU1.2 or RU1.3)

RU1.1. VALID reading on any effluent monitor that exceeds two times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.

RU1.2. VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 60 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds				
Monitor	GE	SAE	Alert	UE
Gaseous				
1(2) R-50 High Range Stack Gas Monitor	3300 mR/hr	330 mR/hr	N/A	N/A
1(2) R-22* Shield Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
2R-30* & 2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
Liquid				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-19*SG Blowdown Radiation Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-21 Circ Water Discharge Monitor	N/A	N/A	200 X Alarm	2 X Alarm

* with Effluent discharge not isolated

RU1.3. Confirmed sample analysis for gaseous or liquid release indicates concentrations or release rates, with a release duration of 60 minutes or longer, in excess of two times ODCM specification.

Basis:

This IC addresses a potential or actual decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. PINGP incorporates features intended to control the release of radioactive effluents to the environment.

Further, there are administrative controls established to prevent unintentional releases, or control and monitor intentional releases. These controls are located in the Offsite Dose Calculation Manual (ODCM) [Ref. 3, 5]. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of a degradation in these features and/or controls.

The ODCM specification multiples are specified in ICs RU1 and RA1 only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an offsite dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, NOT the magnitude of the associated dose or dose rate. Releases should not be prorated or averaged. For example, a release exceeding 4x ODCM specification for 30 minutes does not meet the threshold for this IC.

UNPLANNED, as used in this context, includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit. The Emergency Director should not wait until 60 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 60 minutes. Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Director should, in the absence of data to the contrary, assume that the release has exceeded 60 minutes.

RU1.1 is intended for effluent monitoring on routine release pathways for which a discharge permit is normally prepared. This EAL addresses radioactivity releases, that for whatever reason, cause effluent radiation monitor readings to exceed two times the alarm setpoint established by a current radioactivity discharge permit and releases are not terminated within 60 minutes. These alarm setpoints are associated with a planned batch release, or a continuous release path. In either case, the setpoint is established by the ODCM to warn of a release that is not in compliance with the ODCM specification. Indexing the EAL threshold to the ODCM setpoints in this manner ensures that the EAL threshold will never be less than the setpoint established by a specific discharge permit.

RU1.2 is intended for effluent monitoring on non-routine release pathways for which a discharge permit would not normally be prepared. The ODCM establishes a methodology for determining effluent radiation monitor setpoints. The ODCM specifies default source terms and, for gaseous releases, prescribes the use of pre-determined annual average meteorology in the most limiting downwind sector for showing compliance with the regulatory commitments. These monitor reading EALs have been determined using this methodology. The specific effluent monitor setpoints are changed or managed based on monitor recalibrations and planned plant processes to ensure the final ODCM specification limits are not exceeded. As a result the EAL uses thresholds expressed as 2 times the alarm setpoints.

RU1.3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

RU1.1 and RU1.2 directly correlate with the IC since annual average meteorology is required to be used in showing compliance with the ODCM specifications and is used in calculating the alarm setpoints. The fundamental basis of this IC is NOT a dose or dose rate, but rather the degradation in the level of safety of the plant implied by the uncontrolled release.

PINGP Basis Reference(s):

1. <u>ODCM Section 3.0 Gaseous Effluents</u>

2. <u>ODCM Section 5.1 Gaseous Effluent Monitor Setpoint Determination</u>
3. <u>ODCM Section 2.0 Liquid Effluents</u>
4. <u>ODCM Section 4.1 Liquid Effluent Monitor Setpoint Determination</u>
5. <u>ODCM Appendix A</u>

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

RU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT
Unexpected Increase in Plant Radiation.

Operating Mode Applicability: All

Emergency Action Levels: (RU2.1 or RU2.2)

RU2.1. VALID indication of uncontrolled water level decrease in the reactor refueling cavity, spent fuel pool, or fuel transfer canal with all irradiated fuel assemblies remaining covered by water as indicated by level LESS THAN SFP low water level alarm, Refueling Canal Level, or visual observation (752.5 feet elevation).

AND

Any UNPLANNED VALID Area Radiation Monitor reading increases as indicated by:

- R-5 Fuel Handling Area Monitor reading
- R-28 New Fuel Pool Criticality Area Monitor
- 1(2) R-2 Containment Vessel Area Monitor
- Other Portable Area Radiation Monitoring Instrumentation

RU2.2. Any UNPLANNED VALID Area Radiation Monitor reading increases by a factor of 1000 over normal* levels.
*Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value.

Basis:
This IC addresses increased radiation levels as a result of water level decreases above the RPV flange or events that have resulted, or may result, in unexpected increases in radiation dose rates within plant buildings. These radiation increases represent a loss of control over radioactive material and may represent a potential degradation in the level of safety of the plant.

In light of Reactor Cavity Seal failure incidents at two different PWRs and loss of water in the Spent Fuel Pit/Fuel Transfer Canal at a BWR, explicit coverage of these types of events via RU2.1 is appropriate given their potential for increased doses to plant staff. Classification as an UE is warranted as a precursor to a more serious event. Indications include instrumentation such as water level and local area radiation monitors, and personnel (e.g., refueling crew) reports. If available, video cameras may allow remote observation. There is sufficient level instrumentation such that, the declaration threshold does not need to be based on indications of water makeup rate or decrease in refueling water storage tank level.

While a radiation monitor could detect an increase in dose rate due to a drop in the water level, it might not be a reliable indication of whether or not the fuel is covered. For example, the reading on an area radiation monitor located on the refueling bridge may increase due to planned evolutions such as head lift, or even a fuel assembly being raised in the manipulator mast. Generally, increased radiation monitor indications will need to be combined with another indicator (or personnel report) of water loss. For refueling events where the water level drops below the RPV flange classification would be via CU2. This event escalates to an Alert per IC RA2 if irradiated fuel outside the reactor vessel is uncovered. For events involving irradiated fuel in the reactor vessel, escalation would be via the Fission Product Barrier Matrix for events in operating modes 1-4.

The Spent Fuel Pool (SFP) low level alarm(s) is actuated by LA-634 (SER 055) and LA-639 (SER 067) at 752.5 feet elevation [Ref. 2, 3, 4, 5, 6]. Visual indication also provides indication of possible uncontrolled loss of water level. The Spent Fuel Pool is located in the Auxiliary Building refueling enclosure. During refueling periods, the Spent Fuel Pool is connected to the Refueling Cavity so the SFP level alarm may indicate loss of water inventory in the SFP, transfer canal, or Refueling Cavity.

The movement of spent fuel assemblies within containment requires a minimum water level of 23 ft above the top of the reactor vessel flange [Ref. 7]. During Refueling mode, this maintains sufficient water level in the containment, fuel transfer canal, refueling cavity, and spent fuel pool.

The following area radiation monitors would detect increasing area radiation levels due to a lowering SFP or refueling cavity level [Ref. 1, 8]:

- R-5 Fuel Handling Area Monitor reading
- R-28 New Fuel Pool Criticality Area Monitor
- 1(2) R-2 Containment Vessel Area Monitor
- Temporary or portable radiation monitoring instrumentation should also be considered when evaluating this EAL.

RU2.2 addresses UNPLANNED increases in in-plant radiation levels that represent degradation in the control of radioactive material, and represent a potential degradation in the level of safety of the plant. This event escalates to an Alert per IC RA3 if the increase in dose rates impedes personnel access necessary for safe operation.

PINGP Basis Reference(s):

1. C16 AOP-1 Loss of SFP Inventory
2. D5.2 AOP-3 DECREASING REFUELING WATER LEVEL DURING REFUELING
3. Annunciator 47016-0101, 121 SPENT FUEL PIT LO LVL
4. Annunciator 47016-0401, 122 SPENT FUEL PIT LO LVL
5. Annunciator 47516-0101, 121 SPENT FUEL PIT LO LVL
6. Annunciator 47516-0401, 122 SPENT FUEL PIT LO LVL
7. Technical Specification 3.9.2 Refueling Cavity Water Level
8. B-11 Radiation Monitoring System

Initiating Condition -- ALERT

Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Offsite Dose Calculation Manual Specification for 15 Minutes or Longer.

Operating Mode Applicability: All

Emergency Action Levels: (RA1.1 or RA1.2 or RA1.3)

RA1.1. VALID reading on any effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer.

RA1.2. VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 15 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds

Monitor	GE	SAE	Alert	UE
Gaseous				
1(2) R-50 High Range Stack Gas Monitor	3300 mR/hr	330 mR/hr	N/A	N/A
1(2) R-22* Shield Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
2R-30* & 2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
Liquid				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-19*SG Blowdown Radiation Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-21 Circ Water Discharge Monitor	N/A	N/A	200 X Alarm	2 X Alarm

* with Effluent discharge not isolated

RA1.3. Confirmed sample analysis for gaseous or liquid release indicates concentrations or release rates, with a release duration of 15 minutes or longer, in excess of 200 times ODCM specification.

Basis:

This IC addresses a potential or actual decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. PINGP incorporates features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, or control and monitor intentional releases. These controls are located in the Offsite Dose Calculation Manual (ODCM) [Ref. 3, 5]. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of degradation in these features and/or controls.

The ODCM specification multiples are specified in ICs RU1 and RA1 only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an offsite dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, NOT the magnitude of the associated dose or dose rate. Releases should not be prorated or averaged.

UNPLANNED, as used in this context, includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit. The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes. Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Director should, in the absence of data to the contrary, assume that the release has exceeded 15 minutes. RA1.1 is intended for effluent monitoring on routine release pathways for which a discharge permit is normally prepared. This EAL addresses radioactivity releases that for whatever reason cause effluent radiation monitor readings that exceed two hundred times the alarm setpoint established by the radioactivity discharge permit for greater than 15 minutes. These alarm setpoints are associated with a planned batch release, or a continuous release path. In either case, the setpoint is established by the ODCM to warn of a release that is not in compliance with the ODCM specification. Indexing the EAL threshold to the ODCM setpoints in this manner insures that the EAL threshold will never be less than the setpoint established by a specific discharge permit.

RA1.2 is similar to RA1.1, but is intended to address effluent or accident radiation monitors on non-routine release pathways (i.e., for which a discharge permit would not normally be prepared). The ODCM establishes a methodology for determining effluent radiation monitor setpoints. The ODCM specifies default source terms and, for gaseous releases, prescribes the use of pre-determined annual average meteorology in the most limiting downwind sector for showing compliance with the regulatory commitments. These monitor reading EALs have been determined using this methodology. The specific effluent monitor setpoints are changed or managed based on monitor recalibrations and planned plant processes to ensure the final ODCM specification limits are not exceeded. As a result the EAL uses thresholds expressed as 200 times the alarm setpoints.

RA1.3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

RA1.1 and RA1.2 directly correlate with the IC since annual average meteorology is required to be used in showing compliance with the ODCM specifications and is used in calculating the alarm setpoints. The fundamental basis of this IC is NOT a dose or dose rate, but rather the degradation in the level of safety of the plant implied by the uncontrolled release.

Due to the uncertainty associated with meteorology, emergency implementing procedures call for the timely performance of dose assessments using actual (real-time) meteorology in the event of a gaseous radioactivity release of this magnitude. The results of these assessments should be compared to the ICs RS1 and RG1 to determine if the event classification should be escalated. Classification should not be delayed pending the results of these dose assessments.

PINGP Basis Reference(s):

1. ODCM Section 3.0 Gaseous Effluents
2. ODCM Section 5.1 Gaseous Effluent Monitor Setpoint Determination
3. ODCM Section 2.1 Liquid Effluents
4. ODCM Section 4.1 Liquid Effluent Monitor Setpoint Determination
5. ODCM Appendix A

RA2

Initiating Condition-- ALERT

Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.

Operating Mode Applicability: All

Emergency Action Levels: (RA2.1 or RA2.2)

RA2.1. A VALID alarm or reading on one or more of the following radiation monitors:

- R-25 or R-31 SFP Air Monitor
- R-5 Fuel Handling Area Monitor reading (10 mR/hr)
- R-28 New Fuel Pool Criticality Area Monitor (10 mR/hr)
- 1(2) R-11 Ctmt/SBV Air Particulate Monitor
- 1(2) R-12 Ctmt/SBV Radio Gas Monitor
- 1(2) R-2 Containment Vessel Area Monitor (50 mR/hr)

RA2.2. Report of visual observation of irradiated fuel uncovered

OR

Loss of water inventory as indicated by inadequate makeup rate that will result in irradiated fuel uncovering.

Basis:

This IC addresses specific events that have resulted, or may result, in unexpected increases in radiation dose rates within plant buildings, and may be a precursor to a radioactivity release to the environment. These events represent a loss of control over radioactive material and represent degradation in the level of safety of the plant. These events escalate from IC RU2 in that fuel activity has been released, or is anticipated due to fuel heatup. This IC applies to spent fuel requiring water coverage and is not intended to address spent fuel which is licensed for dry storage, which is discussed in IC EU1.

RA2.1 addresses radiation monitor indications [Ref. 1, 2, 3, 4-10] of fuel uncovery and/or fuel damage. Increased readings on ventilation monitors may be indication of a radioactivity release from the fuel, confirming that damage has occurred. Increased background at the monitor due to water level decrease may mask increased ventilation exhaust airborne activity and needs to be considered. While a radiation monitor could detect an increase in dose rate due to a drop in the water level, it might not be a reliable indication of whether or not the fuel is covered. For example, the monitor could in fact be properly responding to a known event involving transfer or relocation of a source, stored in or near the fuel pool or responding to a planned evolution such as removal of the reactor head. Application of these Initiating Conditions requires understanding of the actual radiological conditions present in the vicinity of the monitor. Information Notice No. 90-08, *"KR-85 Hazards from Decayed Fuel"* was considered in establishing radiation monitor EAL thresholds and there is no impact on this EAL.

In RA2.2, since there is no level indicating system at these low levels in the Spent Fuel Pool, refueling cavity or fuel transfer canal, visual observation of loss of water level would be required. Other indications may include local area radiation monitors, and personnel (e.g., refueling crew) reports. If available, video cameras may allow remote observation. Declaration may need to be based on indications of water makeup capabilities.

Escalation, if appropriate, would occur via IC RS1 or RG1 or Emergency Director judgment.

PINGP Basis Reference(s):

1. C16 AOP-1 Loss of SFP Inventory
2. D5.1 AOP-1 SFP Area Evacuation/Non Refueling
3. D5.2 AOP-4 SFP Area Evacuation/Refueling
4. C47047 R-25 Spent Fuel Pool Air Monitor A
5. C47048 R-31 Spent Fuel Pool Air Monitor B
6. C47048 R-5 Spent Fuel Pool Area Monitor
7. C47047 R-28 New Fuel Pool Criticality Area Monitor
8. C47047 / C47048 1(2)R-11 Containment/Shield Bldg Vent Air Particulate Monitor
9. C47047 / C47048 1(2)R-12 Containment/Shield Bldg Vent Radio Gas Monitor
10. C47047 / C47048 1(2)R-2 Containment Vessel Area Monitor

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

RA3

Initiating Condition -- ALERT

Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown

Operating Mode Applicability: All

Emergency Action Levels: (RA3.1 or RA3.2)

RA3.1. VALID radiation monitor readings GREATER THAN 15 mR/hr in areas requiring continuous occupancy to maintain plant safety functions:

Control Room (Rad monitor R-1)

OR

Central Alarm Station (by portable radiation monitoring instrumentation)

RA3.2. Any VALID radiation monitor reading GREATER THAN 12 R/hr in areas requiring infrequent access to maintain plant safety functions (Table H-1).

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				

*Also consider areas contiguous to these

Basis:

This IC addresses increased radiation levels that impede necessary access to operating stations, or other areas containing equipment that must be operated manually or that requires local monitoring, in order to maintain safe operation or perform a safe shutdown. It is this impaired ability to operate the plant that results in the actual or potential substantial degradation of the level of safety of the plant. The cause and/or magnitude of the increase in radiation levels is not a concern of this IC. The Emergency Director must consider the source or cause of the increased radiation levels and determine if any other IC may be involved. For example, a dose rate of 15 mR/hr in the control room may be a problem in itself. However, the increase may also be indicative of high dose rates in the containment due to a LOCA. In this latter case, an SAE or GE may be indicated by the fission product barrier matrix ICs.

This IC is not meant to apply to increases in the containment radiation monitors as these are events which are addressed in the fission product barrier matrix ICs. Nor is it intended to apply to anticipated temporary increases due to planned events (e.g., incore detector movement, radwaste container movement, depleted resin transfers, etc.).

For RA3.1 areas requiring continuous occupancy include the Control Room, Central Alarm Station (CAS) and Secondary Alarm Station (SAS). The CAS has no installed radiation monitoring capability. The SAS is located in the Control Room Complex and monitored by area Control Room radiation monitor R-1 [Ref. 1]. The value of 15mR/hr is derived from the GDC 19 value of 5 rem in 30 days with adjustment for expected occupancy times. Although Section III.D.3 of NUREG-0737, *"Clarification of TMI Action Plan Requirements"*, provides that the 15 mR/hr value can be averaged over the 30 days, the value is used here without averaging, as a 30 day duration implies an event potentially more significant than an Alert.

For RA3.2 areas requiring infrequent access, the basis of the 12 R/hr value is as follows:

> The PINGP annual administrative personnel exposure limit is 2 Rem/Year. 40% of the 10CFR 20 dose (2 Rem/yr) can be received by PINGP radiation workers without supervisor approval. Assuming an emergency worker is at his administrative limit, any emergency worker needing access to a plant area for the safe shutdown of the plant could receive up to an additional 3 Rem without exceeding the legal 10CFR20 annual exposure limit of 5 Rem [Ref. 4] and thus the need for emergency exposure authorization. Assuming that an activity required to be performed in the plant would, on average, require a 15 minute stay time in that area, an area exposure rate of 12 R/hr would not unduly impede access to areas necessary for safe plant shutdown.

As used here, *impede,* includes hindering or interfering provided that the interference or delay is sufficient to significantly threaten the safe operation of the plant. Table H-1 provides the list of safe shutdown areas requiring infrequent access. The listed areas contain functions and systems required for the safe shutdown of the plant. The PINGP safe shutdown analyses were consulted for equipment and plant areas required for the applicable mode [Ref 3, 4].

In-plant radiation surveys and Area Radiation Monitor (ARM) readings are methods available to assess this EAL. Radiation monitors are not specified in the EAL wording because portable monitoring devices may be used to determine area accessibility.

PINGP Basis Reference(s):

1. 47048 R-01 Control Room Area Monitor
2. F-2 Radiation Safety
3. USAR Section 12.2.1.1 Classification of Structures and Equipment
4. USAR Table 12.2-1 Classification of Structures, Systems and Components

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

RS1

Initiating Condition -- SITE AREA EMERGENCY

Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mRem TEDE or 500 mRem Thyroid CDE for the Actual or Projected Duration of the Release.

Operating Mode Applicability: All

Emergency Action Levels: (RS1.1 or RS1.2 or RS1.3)

Note: *If dose assessment results are available at the time of declaration, the classification should be based on RS1.2 instead of RS1.1. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated.*

RS1.1. VALID reading on one or more monitors listed in Table R-1 that exceeds or is expected to exceed column "SAE" for 15 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds

Monitor	GE	SAE	Alert	UE
Gaseous				
1(2) R-50 High Range Stack Gas Monitor	3300 mR/hr	330 mR/hr	N/A	N/A
1(2) R-22* Shield Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
2R-30* & 2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
Liquid				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-19*SG Blowdown Radiation Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-21 Circ Water Discharge Monitor	N/A	N/A	200 X Alarm	2 X Alarm

* with Effluent discharge not isolated

RS1.2. Dose assessment using actual meteorology indicates doses GREATER THAN 100 mRem TEDE or 500 mRem thyroid CDE at or beyond the site boundary.

RS1.3. Field survey results indicate closed window dose rates exceeding 100 mR/hr expected to continue for more than one hour, at or beyond the site boundary;

OR

Analyses of field survey samples indicate thyroid CDE of 500 mRem for one hour of inhalation, at or beyond the site boundary.

Basis:

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed a small fraction of the EPA Protective Action Guides (PAGs). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public. While these failures are addressed by other ICs, this IC provides appropriate diversity and addresses events which may not be able to be classified on the basis of plant status alone, e.g., fuel handling accident in spent fuel building.

The TEDE dose is set at 10% of the EPA PAG, while the 500 mRem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes. The Table R-1 monitor list in RS1.1 includes monitors on all potential release pathways [Ref. 1, 3, 4, 5, 6, 7].

The EPA PAGs are expressed in terms of the sum of the effective *dose equivalent (EDE)* and the *committed effective dose equivalent (CEDE)*, or as the thyroid *committed dose equivalent (CDE)*. For the purpose of these IC/EALs, the dose quantity *total effective dose equivalent (TEDE)*, as defined in 10 CFR 20, is used in lieu of *"...sum of EDE and CEDE...."* The EPA PAG guidance provides for the use of adult thyroid dose conversion factors.

The Table R-1 column "SAE" effluent monitor readings are derived from Reference 2. The monitor reading EALs were determined by using a dose assessment method that back calculates from the dose values specified in the IC.

Since dose assessment attained in RS1.2 is based on actual meteorology, whereas the monitor reading EALs in RS1.1 are not, the results from these assessments may indicate that the classification is not warranted, or may indicate that a higher classification is warranted. For this reason, emergency implementing procedures call for the timely performance of dose assessments using actual meteorology and release information. If the results of these dose assessments are available when the classification is made (e.g., initiated at a lower classification level), the dose assessment results override the monitor reading EALs.

PINGP Basis Reference(s):

1. B-11 Radiation Monitoring System
2. Memo from Mel Agen to EAL Upgrade Project File: MIDAS Offsite Dose Calculations for R50 Readings Dated 8/14/04
3. F3-20 Determination of Radioactive Release Concentrations
4. Drawing NF-39600
5. Drawings NF-39602-1, NF-39602-2
6. Drawings NF-40762-1, NF-40762-2, NF-40762-3
7. Drawings NF-40753-1, NF-40753-2

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

RG1

Initiating Condition -- GENERAL EMERGENCY

Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.

Operating Mode Applicability: All

Emergency Action Levels: (RG1.1 or RG1.2 or RG1.3)

Note: *If dose assessment results are available at the time of declaration, the classification should be based on RG1.2 instead of RG1.1. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated.*

RG1.1. VALID reading on one or more monitors listed in Table R-1 that exceeds or expected to exceed column "GE" for 15 minutes or longer:

Table R-1 Effluent Monitor Classification Thresholds

Monitor	GE	SAE	Alert	UE
Gaseous				
1(2) R-50 High Range Stack Gas Monitor	3300 mR/hr	330 mR/hr	N/A	N/A
1(2) R-22* Shield Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
1R-30* & 1R-37* Unit 1 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
2R-30* & 2R-37* Unit 2 Aux. Building Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
R-35* Radwaste Building Vent Rad Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-25* & R-31* Spent Fuel Pool Vent Rad Monitors	N/A	N/A	200 X Alarm*	2 X Alarm*
Liquid				
R-18* Waste Effluent Liquid Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-19*SG Blowdown Radiation Monitor	N/A	N/A	200 X Alarm*	2 X Alarm*
R-21 Circ Water Discharge Monitor	N/A	N/A	200 X Alarm	2 X Alarm

* with Effluent discharge not isolated

RG1.2. Dose assessment using actual meteorology indicates doses GREATER THAN 1000 mRem TEDE or 5000 mRem thyroid CDE at or beyond the site boundary.

RG1.3. Field survey results indicate closed window dose rates exceeding 1000 mR/hr expected to continue for more than one hour, at or beyond site boundary

OR

Analyses of field survey samples indicate thyroid CDE of 5000 mRem for one hour of inhalation, at or beyond site boundary.

Basis:

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed the EPA Protective Action Guides (PAGs). Public protective actions will be necessary. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public and likely involve fuel damage. While these failures are addressed by other ICs, this IC provides appropriate diversity and addresses events which may not be able to be classified on the basis of plant status alone. It is important to note that, for the more severe accidents, the release may be unmonitored or there may be large uncertainties associated with the source term and/or meteorology.

The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes. The Table R-1 monitor list in RG1.1 includes monitors on all potential release pathways [Ref. 1, 3, 4, 5, 6, 7].

The EPA PAGs are expressed in terms of the sum of the effective *dose equivalent (EDE)* and the *committed effective dose equivalent (CEDE)*, or as the thyroid *committed dose equivalent (CDE)*. For the purpose of these IC/EALs, the dose quantity *total effective dose equivalent (TEDE)*, as defined in 10 CFR 20, is used in lieu of *"...sum of EDE and CEDE...."* The EPA PAG guidance provides for the use adult thyroid dose conversion factors.

The Table R-1 column "GE" effluent monitor readings are derived from Reference 2. The monitor reading EALs were determined by using a dose assessment method that back calculates from the dose values specified in the IC.

Since dose assessment attained in RG1.2 is based on actual meteorology, whereas the monitor reading EALs in RG1.1 are not, the results from these assessments may indicate that the classification is not warranted, or may indicate that a higher classification is warranted. For this reason, emergency implementing procedures call for the timely performance of dose assessments using actual meteorology and release information. If the results of these dose assessments are available when the classification is made (e.g., initiated at a lower classification level), the dose assessment results override the monitor reading EALs.

PINGP Basis Reference(s):

1. B-11 Radiation Monitoring System
2. Memo from Mel Agen to EAL Upgrade Project File: MIDAS Offsite Dose Calculations for R50 Readings Dated 8/14/04
3. F3-20 Determination of Radioactive Release Concentrations
4. Drawing NF-39600
5. Drawings NF-39602-1, NF-39602-2
6. Drawings NF-40762-1, NF-40762-2, NF-40762-3
7. Drawings NF-40753-1, NF-40753-2

Table C-0
Recognition Category C
Cold Shutdown/Refueling System Malfunction
INITIATING CONDITION MATRIX

UE	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
CU1 RCS Leakage. *Op. Mode: Cold Shutdown*	**CA1** Loss of RCS Inventory. *Op. Modes: Cold Shutdown*	**CS1** Loss of RPV Inventory Affecting Core Decay Heat Removal Capability. *Op. Modes: Cold Shutdown*	**CG1** Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV. Op. Modes: Cold Shutdown, Refueling
CU2 UNPLANNED Loss of RCS Inventory with Irradiated Fuel in the RPV *Op. Mode: Refueling*	**CA2** Loss of RPV Inventory with Irradiated Fuel in the RPV. *Op. Modes: Refueling*	**CS2** Loss of RPV Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV. Op. Modes: Refueling	
CU3 Loss of All Offsite Power to Essential Buses for GREATER THAN 15 Minutes. *Op. Modes: Cold Shutdown, Refueling*	**CA3** Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Buses. *Op. Modes: Cold Shutdown, Refueling, Defueled*		
CU4 UNPLANNED Loss of Decay Heat Removal Capability with Irradiated Fuel in the RPV. *OP. Modes: Cold Shutdown, Refueling*	**CA4** Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV. *Op. Modes: Cold Shutdown, Refueling*		
CU5 Fuel Clad Degradation. *Op. Modes: Cold Shutdown, Refueling*			
CU6 UNPLANNED Loss of All Onsite or Offsite Communications Capabilities. *Op. Modes: Cold Shutdown, Refueling*			
CU7 UNPLANNED Loss of Required DC Power for GREATER THAN 15 Minutes. *Op. Modes: Cold Shutdown, Refueling*			
CU8 Inadvertent Criticality. *Op Modes:, Cold Shutdown, Refueling*			

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SYSTEM MALFUNCTION

CU1

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

RCS Leakage.

Operating Mode Applicability: Cold Shutdown

Emergency Action Levels: (CU1.1 or CU1.2)

CU1.1. Unidentified or pressure boundary leakage GREATER THAN 10 gpm.

CU1.2. Identified leakage GREATER THAN 25 gpm.

Basis:

This IC is included as a UE because it is considered to be a potential degradation of the level of safety of the plant. The 10 gpm value for the unidentified and pressure boundary leakage was selected as it is sufficiently large to be observable via normally installed instrumentation (e.g., Pressurizer level, RCS loop level instrumentation, etc..) or reduced inventory instrumentation such as level hose indication. Lesser values must generally be determined through time-consuming surveillance tests (e.g., mass balances).

The EAL for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage. Prolonged loss of RCS Inventory may result in escalation to the Alert level via either IC CA1 (Loss of RCS Inventory with Irradiated Fuel in the RPV) or CA4 (Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV).

The difference between CU1 and CU2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and RCS inventory and level monitoring means such as Pressurizer level indication and makeup volume control tank levels are normally available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

PINGP Basis Reference(s):

None

SYSTEM MALFUNCTION

CU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of RCS Inventory with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling

Emergency Action Levels: (CU2.1 or CU2.2)

CU2.1. UNPLANNED RCS level decrease below the RPV flange for GREATER THAN OR EQUAL TO 15 minutes

CU2.2. Loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms

AND

RPV level cannot be monitored

Basis:

This IC is included as an UE because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. Refueling evolutions that decrease RCS water level below the RPV flange are carefully planned and procedurally controlled. An UNPLANNED event that results in water level decreasing below the RPV flange warrants declaration of an UE due to the reduced RCS inventory that is available to keep the core covered. The allowance of 15 minutes was chosen because it is reasonable to assume that level can be restored within this time frame using one or more of the redundant means of refill that should be available. If level cannot be restored in this time frame then it may indicate a more serious condition exists. Continued loss of RCS Inventory will result in escalation to the Alert level via either IC CA2 (Loss of RPV Inventory with Irradiated Fuel in the RPV) or CA4 (Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV).

The difference between CU1 and CU2 deals with the RCS conditions that exist between cold shutdown and refueling modes. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

In the refueling mode, normal means of core temperature indication and RCS level indication may not be available. Redundant means of RPV level indication will normally be installed [Ref.1, 2, & 3] (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing Containment Sump A and Waste Holdup Tank level changes. Containment Sump A and Waste Holdup Tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. Escalation to Alert would be via either CA2 or RCS heatup via CA4.

CU2.1 involves a decrease in RCS level below the top of the RPV flange that continues for 15 minutes due to an UNPLANNED event.

This EAL is not applicable to decreases in flooded reactor cavity level (covered by RU2.1) until such time as the level decreases to the level of the vessel flange. If RPV level continues to decrease and reaches the Bottom inside diameter (ID) of the RCS Loop then escalation to CA2 would be appropriate. Note that the Bottom ID of the RCS Loop Setpoint is equal to the bottom of the RPV loop penetration (not the low point of the loop).

PINGP Basis Reference(s):

1. 1C4.1 / 2C4.1 RCS Inventory Control - Pre-Refueling
2. FIG C1-40 refueling Water Levels
3. 1D2 / 2D2 RCS Reduced Inventory Operation

SYSTEM MALFUNCTION

CU3

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Loss of All Offsite Power to Essential Buses for GREATER THAN 15 Minutes.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Level:

CU3.1. Loss of all offsite power to Buses 15(25) and 16(26) for GREATER THAN 15 minutes.

AND

At least one emergency generator is supplying power to an emergency bus.

Basis:

Prolonged loss of AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete Loss of AC Power (e.g., Station Blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Safeguards Buses 15(25) and 16(26) are the Unit 1(2) 4.16KV essential/emergency buses. PINGP emergency diesel generators (EDG) D1 (5) and D2(6) are the "emergency generators".

No credit is provided for restoration of power to a non-affected unit bus. However, bus ties between buses 15 (Unit 1) and 25 (Unit 2) and between buses 16 (Unit 1) and 26 (Unit 2) are available to provide AC power to the affected unit safeguards buses from the unaffected unit and therefore PINGP takes credit for the redundant power source for this IC. However, the inability to effect the cross-tie within 15 minutes warrants declaring a UE.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

SYSTEM MALFUNCTION

CU4

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of Decay Heat Removal Capability with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Levels: (CU4.1 or CU4.2)

CU4.1. An UNPLANNED event results in RCS temperature exceeding 200°F

CU4.2. Loss of all RCS temperature and RPV level indication for GREATER THAN 15 minutes.

Basis:

This IC is included as an UE because it may be a precursor of more serious conditions and, as a result, is considered to be a potential degradation of the level of safety of the plant. In cold shutdown the ability to remove decay heat relies primarily on forced cooling flow. Operation of the systems that provide this forced cooling may be jeopardized due to the unlikely loss of electrical power or RCS inventory. Since the RCS usually remains intact in the cold shutdown mode a large inventory of water is available to keep the core covered. In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Entry into cold shutdown conditions may be attained within hours of operating at power. Entry into the refueling mode procedurally does not occur for 50 hours [Ref. 3] or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). In addition, the operators should be able to monitor RCS temperature and RPV level so that escalation to the alert level via CA4 or CA1 will occur if required.

During refueling the level in the RPV will normally be maintained above the RPV flange. Refueling evolutions that decrease water level below the RPV flange are carefully planned and procedurally controlled. Loss of forced decay heat removal at reduced inventory may result in more rapid increases in RCS/RPV temperatures depending on the time since shutdown. Escalation to the Alert level is via CA4.

Unlike the cold shutdown mode, normal means of core temperature indication and RCS level indication may not be available in the refueling mode. Redundant means of RPV level indication are therefore procedurally installed to assure that the ability to monitor level will not be interrupted. However, if all level and temperature indication were to be lost in either the cold shutdown or refueling modes, CU4.2 would result in declaration of an Unusual Event if either temperature or level indication cannot be restored within 15 minutes from the loss of both means of indication. Escalation to Alert would be via CA2 based on an inventory loss or CA4 based on exceeding its temperature criteria (200°F) [Ref. 1].

RPV water level is normally monitored using the following instruments:

- RCS Narrow Range (ERCS DP Train A&B)
- RCS Ultrasonic Level (Train A&B)
- Refueling Canal Level
- RVLIS Full Range

Figure C1-40, Refueling Water Levels, provides a cross-reference table of indicated water levels and key plant elevations. [Ref. 2]

Several instruments are capable of providing indication of RCS temperature with respect to the Technical Specification cold shutdown temperature limit (200°F). However, loss of forced decay heat removal flow may render RCS loop or RHR inlet temperature instruments readings invalid.

The Emergency Director must remain attentive to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the Emergency Director, an imminent situation is at hand, the classification should be made as if the threshold has been exceeded.

PINGP Basis Reference(s):

1. Technical Specifications Table 1.1-1, Modes Definition for Cold Shutdown
2. FIG C1-40 Refueling Water Levels
3. TS Bases B.3.9.2, Refueling Cavity Water Level

CU5

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Fuel Clad Degradation.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Levels: (CU5.1 or CU5.2)

CU5.1. RCS Letdown Rad Monitor 1(2)R-9 or portable radiation monitoring instrumentation GREATER THAN 2.4 R/hr indicating fuel clad degradation

CU5.2. Coolant sample activity GREATER THAN Technical Specification 3.4.17 allowable limits indicating fuel clad degradation.

Basis:

This IC is included as a UE because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems. CU5.1 addresses site-specific radiation monitor readings that provide indication of fuel clad integrity [Ref. 2]. CU5.2 addresses coolant samples exceeding coolant technical specifications for iodine spike [Ref. 1].

Letdown line radiation is detected by the Letdown Line Rad Monitor 1(2)R-9. This EAL threshold is based on a valid R-9 high alarm or portable radiation monitoring equipment indicating RCS activity is at or about the Technical Specification allowable limit [Ref.3]. If R-9 is not in service, routine coolant activity sampling will identify the condition.

Although the Technical Specification is applicable for modes 1, 2 and 3 (when average reactor coolant temperature is GREATER THAN 500°F), it is appropriate that this EAL be applicable in cold shutdown and refueling modes, as it indicates a potential degradation in the level of safety of the plant.

PINGP Basis Reference(s):

1. Technical Specifications 3.4.17
2. USAR Section 10.2.3.3.7
3. R-9 Rad Monitors & Fuel Cladding Damage Based on USAR, October 11, 2004

CU6

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of All Onsite or Offsite Communications Capabilities.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Levels: (CU6.1 or CU6.2)

CU6.1. Loss of all Table C-1 onsite communications capability affecting the ability to perform routine operations.

Table C-1 Onsite Communications Systems
• Sound Powered Phones
• Plant Paging System
• Plant Telephone Network
• Plant Radio System

CU6.2. Loss of all Table C-2 offsite communications capability.

Table C-2 Offsite Communications Systems
• Plant Telephone Network
• Plant Radio System (dedicated offsite channels)
• ENS Network

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities. The loss of offsite communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

The availability of one method of ordinary offsite communications is sufficient to inform state and local authorities of plant problems. This EAL is intended to be used only when extraordinary means (e.g., relaying of information from radio transmissions, individuals being sent to offsite locations, etc.) are being utilized to make communications possible.

Onsite communications loss (Table C-1) encompasses the loss of all means of routine communications (e.g., commercial telephones, sound powered phone systems, page party system and radios / walkie talkies).

Offsite communications loss (Table C-2) encompasses the loss of all means of communications with offsite authorities. This includes the ENS, commercial telephone lines, telecopy transmissions, dedicated offsite radio channels, and dedicated phone systems.

PINGP Basis Reference(s):

1. PINGP Emergency Plan, Section 7.2

CU7

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of Required DC Power for GREATER THAN 15 Minutes.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Level:

CU7.1 UNPLANNED Loss of required vital DC power based on LESS THAN 112 VDC on 125 VDC Panels 11(21) and 12(22)

AND

Failure to restore power to at least one required DC panel within 15 minutes from the time of loss.

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of DC power compromising the ability to monitor and control the removal of decay heat during Cold Shutdown or Refueling operations. This EAL is intended to be anticipatory in as much as the operating crew may not have necessary indication and control of equipment needed to respond to the loss.

UNPLANNED is included in this IC and EAL to preclude the declaration of an emergency as a result of planned maintenance activities. Routinely plants will perform maintenance on a Train related basis during shutdown periods. It is intended that the loss of the operating (operable) train is to be considered. If this loss results in the inability to maintain cold shutdown, the escalation to an Alert will be per CA4 "Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV."

LESS THAN 112 VDC bus voltage is based on the minimum bus voltage necessary for the operation of safety related equipment [Ref. 1, 2, 9]. This voltage value incorporates a margin of at least .5 volts of operation before the onset of inability to operate those loads.

PINGP uses "Panel" rather than "Bus" for the 125 VDC system. 125 VDC Panels 11 and 12 serve Unit 1 and 125 VDC Panels 21 and 22 serve Unit 2.

Each of the two station batteries per Unit has been sized to carry expected shutdown loads following a plant trip, and a loss of AC battery charging power for a period of 1 hour without battery terminal voltage falling below the minimum required voltage. Depending on which DC bus, the minimum required voltage ranges from approximately 109.5 to 111.5 VDC, based on site specific calculations to assure that the needed load voltage of is available. [Ref. 9]. The LESS THAN 112 VDC value was chosen as a limiting value encompassing the four DC busses and incorporates a minimum margin of .5 VDC. Each of the four battery chargers has been sized to recharge its associated partially discharged battery within 24 hours, while carrying its normal load.

PINGP Basis Reference(s):

1. USAR Section 8.5
2. USAR Figure 8.5-1A & 8.5-1B
3. USAR Figure 8.5-2A & 8.5-2B
4. Technical Specifications 3.8.9
5. 1C20.9 AOP1 Loss of Unit 1 Train "A" DC
6. 1C20.9 AOP2 Loss of Unit 1 Train "B" DC
7. 2C20.9 AOP1 Loss of Unit 2 Train "A" DC
8. 2C20.9 AOP2 Loss of Unit 2 Train "B" DC
9. Engineering Calculations 91-02-11 Rev 0, 91-02-12 Rev 1, 91-02-21 Rev 0, 91-02-22 Rev 0

SYSTEM MALFUNCTION

CU8

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Inadvertent Criticality.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Level:

CU8.1. An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

Basis:

This IC addresses criticality events that occur in Cold Shutdown or Refueling modes (NUREG 1449, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States) such as fuel mis-loading events and inadvertent dilution events. This IC indicates a potential degradation of the level of safety of the plant, warranting an Unusual Event classification. This IC excludes inadvertent criticalities that occur during planned reactivity changes associated with reactor startups (e.g., criticality earlier than estimated) which are addressed in the companion IC SU8.

This condition can be identified using startup rate monitor. The term "sustained" is used in order to allow exclusion of expected short term positive startup rates from planned fuel bundle or control rod movements during core alteration. These short term positive startup rates are the result of the rise in neutron population due to subcritical multiplication.

This condition can be identified using source range monitors 1(2)N-31 and 1(2)N-32, NIS recorder NR-45, audible count rate monitor 1(2)N34A, and the shutdown monitor.

Escalation would be by Emergency Director Judgment.

SYSTEM MALFUNCTION

CA1

Initiating Condition -- ALERT

Loss of RCS Inventory.

Operating Mode Applicability: Cold Shutdown

Emergency Action Levels: (CA1.1 or CA1.2)

CA1.1. Loss of RCS inventory as indicated by RPV level at 0 inches Refueling Canal/RCS Narrow Range/Ultrasonic (at or LESS THAN 75% RVLIS Full Range)

CA1.2. Loss of RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms

AND

RCS level cannot be monitored for GREATER THAN 15 minutes

Basis:

These EALs serve as precursors to a loss of ability to adequately cool the fuel. The magnitude of this loss of water indicates that makeup systems have not been effective and may not be capable of preventing further RPV level decrease and potential core uncovery. The 0 inches Refueling Canal, /RCS Narrow Range, and Ultrasonic level (at or less than 75% RVLIS Full Range) threshold corresponds to the bottom inside diameter of the RCS loop [Ref. 1, 2]. This condition will result in a minimum classification of Alert. The Bottom inside diameter (ID) of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost and loss of suction to decay heat removal systems has occurred. The Bottom ID of the RCS Loop Setpoint is the level equal to the bottom of the RPV loop penetration (not the low point of the loop). The inability to restore and maintain level after reaching this setpoint would therefore be indicative of a failure of the RCS barrier.

The elevation of the bottom of the RCS hot leg can be monitored by:

- RCS Narrow Range (ERCS DP Train A&B): 0 inches
- RCS Ultrasonic Level (Train A&B) 0 inches
- Refueling Canal Level: 0 inches
- RVLIS Full Range: 75%

Figure C1-40, Refueling Water Levels, provides a cross-reference table of indicated water levels and key plant elevations. [Refs. 1, 2].

In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Entry into cold shutdown conditions may be attained within hours of operating at power or hours after refueling is completed. Entry into the refueling mode procedurally does not occur for 50 hours [Ref. 3]or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). The above forms the basis for needing both a cold shutdown specific IC (CA1) and a refueling specific IC (CA2).

In the cold shutdown mode, normal RCS level and RPV level instrumentation systems will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Containment Sump A receives all liquid waste from floor and equipment drains inside containment including that from Refueling Cavity Sump C. Sump C receives any leakage from immediately around the reactor vessel. Since neither of these sumps has level indication, abnormal leakage must be detected via sump high level alarms, or increase in sump pump run times [Ref. 4]. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. The 15-minute duration for the loss of level indication was chosen because it is half of the CS1 Site Area Emergency EAL duration. The 15-minute duration allows CA1 to be an effective precursor to CS1. Significant fuel damage is not expected to occur until the core has been uncovered for greater than 1 hour per the analysis referenced in the CS1 basis. Therefore this EAL meets the definition for an Alert emergency.

The difference between CA1 and CA2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

If RPV level continues to decrease then escalation to Site Area will be via CS1 (Loss of Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV).

PINGP Basis Reference(s):

1. Reactor Vessel Level (RVLSI Full Range), October 19, 2004
2. FIG C1-40 refueling Water Levels
3. TS Bases B.3.9.2, Refueling Cavity Water Level
4. NF-39248, Flow Diagram – Aux & Rx Bldg Floor & Equipment Drain System

SYSTEM MALFUNCTION

CA2

Initiating Condition -- ALERT

Loss of RPV Inventory with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling

Emergency Action Levels: (CA2.1 or CA2.2)

CA2.1. Loss of RPV inventory as indicated by RPV level at 0 inches Refueling Canal/RCS Narrow Range/Ultrasonic

CA2.2. Loss of RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms

AND

RPV level cannot be monitored for GREATER THAN 15 minutes

Basis:

These example EALs serve as precursors to a loss of heat removal. The magnitude of this loss of water indicates that makeup systems have not been effective and may not be capable of preventing further RPV level decrease and potential core uncovery. The 0 inches Refueling Canal, RCS Narrow Range, and Ultrasonic level indication threshold corresponds to the bottom inside diameter (ID) of the RCS loop [Ref. 2]. This condition will result in a minimum classification of Alert. The Bottom ID of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost and loss of suction to decay heat removal systems may occur. The Bottom ID of the RCS Loop Setpoint is the level equal to the bottom of the RPV loop penetration (not the low point of the loop). The inability to restore and maintain level after reaching this setpoint would therefore be indicative of a failure of the RCS barrier.

The elevation of the bottom of the RCS hot leg can be monitored by:

- RCS Narrow Range (ERCS DP Train A&B): 0 inches
- RCS Ultrasonic Level (Train A&B): 0 inches
- Refueling Canal Level: 0 inches

Figure C1-40, Refueling Water Levels, provides a cross-reference table of indicated water levels and key plant elevations.

[Ref. 2]

In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Entry into cold shutdown conditions may be attained within hours of operating at power or hours after refueling is completed. Entry into the refueling mode procedurally does not occur for 50 hours [Ref. 1]or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). The above forms the basis for needing both a cold shutdown specific IC (CA1) and a refueling specific IC (CA2).

In the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will be normally installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Containment Sump A receives all liquid waste from floor and equipment drains inside containment including that from Refueling Cavity Sump C. Sump C receives any leakage from immediately around the reactor vessel. Since neither of these sumps has level indication, abnormal leakage must be detected via sump high level alarms, or increased sump pump run times. [Ref. 3] Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. The 15-minute duration for the loss of level indication was chosen because it is half of the CS2 Site Area Emergency EAL duration. The 15-minute duration allows CA2 to be an effective precursor to CS2. Significant fuel damage is not expected to occur until the core has been uncovered for greater than 1 hour per the analysis referenced in the CS2 basis. Therefore this EAL meets the definition for an Alert.

The difference between CA1 and CA2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

If RPV level continues to decrease then escalation to Site Area will be via CS1 (Loss of Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV).

PINGP Basis Reference(s):

1. TS Bases B.3.9.2, Refueling Cavity Water Level
2. FIG C1-40 refueling Water Levels
3. NF-39248, Flow Diagram – Aux & Rx Bldg Floor & Equipment Drain System

SYSTEM MALFUNCTION

CA3

Initiating Condition -- ALERT

Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Buses.

Operating Mode Applicability: Cold Shutdown
Refueling
Defueled

Emergency Action Level:

CA3.1. Loss of all offsite power to Buses 15(25) and 16(26)

AND

Failure of all emergency generators to supply power to emergency Buses 15(25) and 16(26).

AND

Failure to restore power to at least one emergency bus within 15 minutes from the time of loss of both offsite and onsite AC power.

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal, Spent Fuel Heat Removal and the Ultimate Heat Sink. When in cold shutdown, refueling, or defueled mode the event can be classified as an Alert, because of the significantly reduced decay heat, lower temperature and pressure, increasing the time to restore one of the emergency busses, relative to that specified for the Site Area Emergency EAL. Escalating to Site Area Emergency IC SS1, if appropriate, is by Abnormal Rad Levels / Radiological Effluent, or Emergency Director Judgment ICs. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This EAL is indicated by the loss of all offsite and onsite AC power to the 4.16KV Safeguards buses. Safeguards Buses 15(25) and 16(26) are the Unit 1(2) 4.16KV essential/emergency buses. PINGP emergency diesel generators (EDG) D1 (5) and D2(6) are the "emergency generators". No credit is provided for restoration of power to a non-affected unit bus. However, bus ties between buses 15 (Unit 1) and 25 (Unit 2) and between buses 16 (Unit 1) and 26 (Unit 2) are available to provide AC power to the affected from the non-affected unit.

Consideration should be given to operable loads necessary to remove decay heat or provide Reactor Vessel makeup capability when evaluating loss of AC power to essential buses. Even though an essential bus may be energized, if necessary loads (i.e., loads that if lost would inhibit decay heat removal capability or Reactor Vessel makeup capability) are not operable on the energized bus then the bus is not be considered operable.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

CA4

Initiating Condition -- ALERT

Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Levels: (EAL CA4.1 or CA4.2 or CA4.3)

CA4.1. With CONTAINMENT CLOSURE and RCS integrity not established an UNPLANNED event results in RCS temperature exceeding 200 degrees F.

CA4.2. With CONTAINMENT CLOSURE established and RCS integrity not established or RCS inventory reduced an UNPLANNED event results in RCS temperature exceeding 200 degrees F for GREATER THAN 20 minutes[1].

CA4.3. An UNPLANNED event results in RCS temperature exceeding 200 degrees F for GREATER THAN 60 minutes[1] or results in an RCS pressure increase of GREATER THAN 25 psig.

Basis:

CA4.1 addresses complete loss of functions required for core cooling during refueling and cold shutdown modes when neither CONTAINMENT CLOSURE nor RCS integrity are established. RCS integrity is in place when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). No delay time is allowed for CA4.1 because the evaporated reactor coolant that may be released into the Containment during this heatup condition could also be directly released to the environment.

CA4.2 addresses the complete loss of functions required for core cooling for GREATER THAN 20 minutes during refueling and cold shutdown modes when CONTAINMENT CLOSURE is established but RCS integrity is not established or RCS inventory is reduced (e.g., mid loop operation). As in CA4.1, RCS integrity should be assumed to be in place when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). The allowed 20 minute time frame was included to allow operator action to restore the heat removal function, if possible. The allowed time frame is consistent with the guidance provided by Generic Letter 88-17, "Loss of Decay Heat Removal" (discussed later in this basis) and is believed to be conservative given that a low pressure Containment barrier to fission product release is established. Note 1 indicates that CA4.2 is not applicable if actions are successful in restoring an RCS heat removal system to operation and RCS temperature is being reduced within the 20 minute time frame.

CA4.3 addresses complete loss of functions required for core cooling for GREATER THAN 60 minutes during refueling and cold shutdown modes when RCS integrity is established. As in CA4.1 and CA4.2, RCS integrity should be considered to be in place when the RCS pressure boundary is

[1]Note: if an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced then this EAL is not applicable.

in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). The status of CONTAINMENT CLOSURE in this EAL is immaterial given that the RCS is providing a high pressure barrier to fission product release to the environment. The 60 minute time frame allows sufficient time to restore cooling without a substantial degradation in plant safety. The 25 psig pressure increase covers situations where, due to high decay heat loads, the time provided to restore temperature control, should be less than 60 minutes. The 25 psig RCS pressure setpoint is the lowest pressure that Operations can read on PR-42043 [PR-42616], RCS PRESSURE (installed Control Board instrumentation). Note 1 indicates that CA4.3 is not applicable if actions are successful in restoring an RCS heat removal system to operation and RCS temperature is being reduced within the 60 minute time frame assuming that the RCS pressure increase has remained less than the site specific pressure value.

Several instruments are capable of providing indication of RCS temperature with respect to the Technical Specification cold shutdown temperature limit (200°F) [Ref. 1]. However, loss of forced decay heat removal flow may render RCS loop or RHR inlet temperature instruments readings invalid.

Escalation to Site Area would be via CS1 or CS2 should boiling result in significant RPV level loss leading to core uncovery.

This IC and its associated EALs are based on concerns raised by Generic Letter 88-17, "Loss of Decay Heat Removal." A number of phenomena such as pressurization, vortexing, steam generator U-tube draining, RCS level differences when operating at a mid-loop condition, decay heat removal system design, and level instrumentation problems can lead to conditions where decay heat removal is lost and core uncovery can occur. NRC analyses show that sequences that can cause core uncovery in 15 to 20 minutes and severe core damage within an hour after decay heat removal is lost.

A loss of Technical Specification components alone is not intended to constitute an Alert. The same is true of a momentary UNPLANNED excursion above 200 degreesF when the heat removal function is available.

The Emergency Director must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is imminent. If, in the judgment of the Emergency Director, an imminent situation is at hand, the classification should be made as if the threshold has been exceeded.

PINGP Basis Reference(s):

1. Technical Specifications Table 1.1-1, Modes Definition for Cold Shutdown

SYSTEM MALFUNCTION

CS1

Initiating Condition -- SITE AREA EMERGENCY

Loss of RPV Inventory Affecting Core Decay Heat Removal Capability.

Operating Mode Applicability: Cold Shutdown

Emergency Action Levels: (CS1.1 or CS1.2)

CS1.1. With CONTAINMENT CLOSURE not established:

a. RPV inventory as indicated by RPV level LESS THAN 73% RVLIS Full Range

OR

b. RPV level cannot be monitored for GREATER THAN 30 minutes with a loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms

CS1.2. With CONTAINMENT CLOSURE established:

a. RPV inventory as indicated by RPV level LESS THAN 63% RVLIS Full Range

OR

b. RPV level cannot be monitored for GREATER THAN 30 minutes with a loss of RPV inventory as indicated by either:
- Unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms
- Erratic Source Range Monitor Indication

Basis:

Under the conditions specified by this IC, continued decrease in RPV level is indicative of a loss of inventory control. Inventory loss may be due to an RPV breach, pressure boundary leakage, or continued boiling in the RPV. In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Entry into cold shutdown conditions may be attained within hours of operating at power or hours after refueling is completed. Entry into the refueling mode procedurally does not occur for 50 hours [Ref. 3]or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). The above forms the basis for needing both a cold shutdown specific IC (CS1) and a refueling specific IC (CS2).

In the cold shutdown mode, normal RCS level and reactor vessel level indication systems (RVLIS) will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Containment Sump A receives all liquid waste from floor and equipment drains inside containment. Sump C receives any leakage from immediately around the reactor vessel. Since neither of these sumps has level indication, abnormal leakage must be detected via sump high level alarms, or increased sump pump run times [Ref. 4.] Containment Sump A is equipped with a high level alarm. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

These EALs are based on concerns raised by Generic Letter 88-17, *Loss of Decay Heat Removal*, SECY 91-283, *Evaluation of Shutdown and Low Power Risk Issues*, NUREG-1449, *Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States*, and, NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management.* A number of variables, (PWRs - e.g., mid-loop, reduced level/flange level, head in place, or cavity flooded, RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining) can have a significant impact on heat removal capability challenging the fuel clad barrier. Analysis in the above references indicates that core damage may occur within an hour following continued core uncovery therefore, conservatively, 30-minutes was chosen.

When RPV water level drops to 73% RVLIS full range, the level associated without CONTAINMENT CLOSURE established, is approximately six inches below the bottom of the RCS hot leg vessel penetration. This level can only be remotely monitored by RVLIS Full Range; RCS Narrow Range (ERCS DP Train A & B) and Refueling Canal Level instruments are offscale low for any water level below the elevation of the RCS hot leg.

When RPV water level drops to 63% RVLIS full range, the level associated with CONTAINMENT CLOSURE established, core uncovery is about to occur. RVLIS Full Range indication of 55% is approximately the top of active fuel [Ref. 1, 2].
. If RVLIS is not available such that the RPV level cannot be determined, then EAL CS1.b should be used to determine if the IC has been met. The 30-minute duration allowed when CONTAINMENT CLOSURE is established allows sufficient time for actions to be performed to recover needed cooling equipment and is considered to be conservative given that level is being monitored via CS1 and CS2. Effluent release is not expected with closure established.

Thus, declaration of a Site Area Emergency is warranted under the conditions specified by the IC. Escalation to a General Emergency is via CG1 (Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV) or radiological effluent IC RG1 (Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology).

PINGP Basis Reference(s):

1. Reactor Vessel Level (RVLSI Full Range), October 19, 2004
2. FIG C1-40 refueling Water Levels
3. TS Bases B.3.9.2, Refueling Cavity Water Level
4. NF-39248, Flow Diagram –Aux & Rx Bldg Floor & Equipment Drain Systems

CS2

Initiating Condition -- SITE AREA EMERGENCY

Loss of RPV Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling

Emergency Action Levels: (CS2.1 or CS2.2)

CS2.1. With CONTAINMENT CLOSURE not established and RPV level cannot be monitored, with indication of core uncovery as evidenced by one or more of the following:

- Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN 5 R/hr
- Erratic Source Range Monitor Indication

CS2.2. With CONTAINMENT CLOSURE established,

and RPV level cannot be monitored, with indication of core uncovery as evidenced by one or more of the following:

- Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN 5 R/hr
- Erratic Source Range Monitor Indication

Basis:

This IC should not be used for classification unless RPV level is below the bottom inside diameter (ID) of the RCS hot leg penetration. At this point, RPV level indication is no longer available in the Refueling mode. If level is at or above the Bottom ID, CU2 or CA2 should be used for event classification in the Refueling mode.

Under the conditions specified by this IC, continued decrease in RPV level is indicative of a loss of inventory control. Inventory loss may be due to an RPV breach or continued boiling in the RPV.

In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode Entry into cold shutdown conditions may be attained within hours of operating at power or hours after refueling is completed. Entry into the refueling mode procedurally does not occur for 50 hours [Ref. 1]or longer after the reactor has been shutdown. Thus the heatup threat and therefore the threat to damaging the fuel clad may be lower for events that occur in the refueling mode with irradiated fuel in the RPV (note that the heatup threat could be lower for cold shutdown conditions if the entry into cold shutdown was following a refueling). The above forms the basis for needing both a cold shutdown specific IC (CS1) and a refueling specific IC (CS2).

These EALs are based on concerns raised by Generic Letter 88-17, *Loss of Decay Heat* Removal, SECY 91-283, *Evaluation of Shutdown and Low Power Risk Issues*, NUREG-1449, *Shutdown and*

Low-Power Operation at Commercial Nuclear Power Plants in the United States, and, NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management*. A number of variables, – (e.g., mid-loop, reduced level/flange level, head in place, or cavity flooded, RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining) can have a significant impact on heat removal capability challenging the fuel clad barrier. Analysis in the above references indicates that core damage may occur within an hour following continued core uncovery.

NEI EAL 1.a and 2.a use RPV level in classification. However, in the Refueling mode this level cannot be remotely monitored; RVLIS is out-of-service in the Refueling mode, and RCS Narrow Range (ERCS DP Train A&B), Refueling Canal, and Ultrasonic level indication is offscale low for any water level below the bottom of the RCS hot legs [Ref. 2]. Under such conditions, personnel would not be in containment for observation, and there are no remote cameras installed to monitor level under this condition. Per NEI 99-04 technical guidance, if a RVLIS is not available such that the PWR EAL setpoint cannot be determined, then EAL 1.b and 2.b. should be used to determine if the IC has been met. This results in no reference to RPV level in PINGP EAL CS2.1 and CS2.2, and, for both, the same EAL indications are used irrespective of whether CONTAINMENT CLOSURE is established or not. However, separate EALs are maintained such that the Emergency Director remains aware of the status of CONTAINMENT CLOSURE, and so this status is provided to off-site agencies via notification of event classification. Effluent release is not expected with CONTAINMENT CLOSURE established.

As water level in the RPV lowers, the dose rate above the core will increase. The dose rate due to this core shine should result in up-scaled Containment High Range Monitor indication and possible alarm. EAL 2.1 and EAL 2.2 values are based on a conservative estimate of a dose rate setpoint indicative of core uncovery (i.e. level at TOAF). Containment High Range Radiation Monitor (R48 or R49) provides an indication of core uncovery by increased radiation level indication. A setpoint of GREATER THAN 5 R/hr is based upon the lowest threshold of Operations readability for indication of an actual change from the normal reading (normally reads 1.5 to 3 R/Hr)

Post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered. Source Range Monitors, 1(2)N-31 and 1(2)N-32B, can be used as a tool for making such determinations. SRM countrate can also be indicated in the Control Room by the NIS recorder NR-45, audible count rate monitor 1(2)N34A and the shutdown monitor.

Thus, declaration of a Site Area Emergency is warranted under the conditions specified by the IC. Escalation to a General Emergency is via CG1 (Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV) or radiological effluent IC RG1 (Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology).

PINGP Basis Reference(s):

1. TS Bases B.3.9.2, Refueling Cavity Water Level
2. FIG C1-40 refueling Water Levels

SYSTEM MALFUNCTION

CG1

Initiating Condition -- GENERAL EMERGENCY

Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Level:

CG1.1.

Loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms

AND

RPV Level:

a. LESS THAN 63% RVLIS Full Range for GREATER THAN 30 minutes

OR

b. cannot be monitored, with indication of core uncovery for GREATER THAN 30 minutes as evidenced by one or more of the following:
   - Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN 5 R/hr
   - Erratic Source Range Monitor Indication

AND

Indication of CONTAINMENT challenged as indicated by one or more of the following:

- Containment hydrogen concentration GREATER THAN OR EQUAL TO 6%
- Containment pressure GREATER THAN 46 psig
- CONTAINMENT CLOSURE not established

Basis:

In the cold shutdown mode, normal RCS level and RPV level instrumentation systems will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level increases must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.
In the Refueling mode, RPV level indication via RVLIS will not be available, and no other means of level indication for classification purposes are available under this condition. Operators need to determine that RPV inventory loss is occurring by observing sump and tank level changes.

For both cold shutdown and refueling modes sump and tank level increases are evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.This EAL represents the inability to restore and maintain RPV level to above the top of active fuel. Fuel damage is probable if RPV level cannot be restored, as available decay heat will cause boiling, further reducing the RPV level. When RPV water level drops to the top of active fuel, core uncovery is about to occur. RVLIS Full Range indication of 63% is approximately the top of active fuel. [Refs. 1, 2]

This EAL is based on concerns raised by Generic Letter 88-17, *Loss of Decay Heat Removal*, SECY 91-283, *Evaluation of Shutdown and Low Power Risk Issues*, NUREG-1449, *Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States*, and, NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management.* A number of variables–(e.g., mid-loop, reduced level/flange level, head in place, or cavity flooded, RCS venting strategy, decay heat removal system design, vortexing pre-disposition, steam generator U-tube draining) can have a significant impact on heat removal capability challenging the fuel clad barrier. Analysis in the above references indicates that core damage may occur within an hour following continued core uncovery therefore, conservatively, 30 minutes was chosen.

If all means of level monitoring are not available, the RPV inventory loss may be detected by the SRMs. Post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered and Source Range Monitors, 1(2)N-31 and 1(2)N-32B, can be used as a tool for making such determinations. SRM countrate can also be indicated in the Control Room by the NIS recorder NR-45, audible count rate monitor 1(2)N34A and the shutdown monitor.

Containment High Range Radiation Monitor (R48 or R49) can also provide an indication of core uncovery by increased radiation level indication. A setpoint of GREATER THAN 5 R/hr is based upon the lowest threshold of Operations readability for indication of an actual change from the normal reading (normally reads 1.5 to 3 R/hr)

Containment Sump level changes may be indicative of a loss of RCS inventory. Containment Sump A receives all liquid waste from floor and equipment drains inside containment. Sump C receives any leakage from immediately around the reactor vessel. Since neither of these sumps has level indication, abnormal leakage must be detected via sump high level alarms, or increased sump pump run times. Sump level rises must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. [Ref. 3]

The GE is declared on the occurrence of the loss or imminent loss of function of <u>all three</u> barriers. Based on the above discussion, RCS barrier failure resulting in core uncovery for 30 minutes or more may cause fuel clad failure. With the CONTAINMENT breached or challenged then the potential for unmonitored fission product release to the environment is high. This represents a direct path for radioactive inventory to be released to the environment. This is consistent with the definition of a GE.

CONTAINMENT CLOSURE is the action taken to secure containment and its associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions. CONTAINMENT CLOSURE should not be confused with refueling containment integrity as defined in technical specifications. Site shutdown contingency plans typically provide for re-establishing CONTAINMENT CLOSURE following a loss of heat removal or RCS inventory functions. If the closure is re-established prior to exceeding the temperature or level thresholds of the RCS Barrier and Fuel Clad Barrier EALs, escalation to GE would not occur.

In the early stages of a core uncovery event, it is unlikely that hydrogen buildup due to a core uncovery could result in an explosive mixture of dissolved gasses in CONTAINMENT. However, CONTAINMENT monitoring and/or sampling should be performed to verify this assumption and a General Emergency declared if it is determined that an explosive mixture exists. When hydrogen and oxygen concentrations reach or exceed the deflagration limits (equal to or greater than 6% hydrogen), loss of the containment barrier is possible [Ref. 5]. Two containment hydrogen monitor channels with a range of 0 -10% by volume continuously monitor the containment environment and are recorded in the Control Room.

The containment design pressure (46 psig) is well in excess of that expected from the design basis loss of coolant accident [Ref. 5].

PINGP Basis Reference(s):

1. Fig. C1-40, Refueling Water Levels
2. Reactor Vessel Level (RVLIS Full Range), October 19, 2004
3. NF-39248, Flow Diagram – Aux & Rx Bldg Floor & Equipment Drain Systems
4. F-0.5 Containment
5. FR-C.1 Response to Inadequate Core Cooling

Table E-0

Recognition Category E

Events Related to ISFSI Malfunction

INITIATING CONDITION MATRIX

UE

EU1	Damage to a loaded cask CONFINEMENT BOUNDARY. *Op. Mode: Not Applicable*
EU2	Confirmed security event with potential loss of level of safety of the ISFSI *Op. Mode: Not Applicable*

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EU1

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Damage to a loaded cask CONFINEMENT BOUNDARY.

Operating Mode Applicability: Not applicable

Emergency Action Level: (EU1.1 or EU1.2 or EU1.3)

EU1.1. Natural phenomena events affecting a loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask.

- earthquake
- tornado (and tornado missile)
- flood
- lightning
- snow/ice

EU1.2. Accident conditions affecting a loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask.

- dropped cask
- tipped over cask
- cask burial
- explosion
- fire

EU1.3. Any condition in the opinion of the Emergency Director that indicates loss of loaded fuel storage cask CONFINEMENT BOUNDARY.

Basis:

A UE in this IC is categorized on the basis of the occurrence of an event of sufficient magnitude that a loaded cask CONFINEMENT BOUNDARY is damaged or violated. This includes classification based on a loaded fuel storage cask CONFINEMENT BOUNDARY loss leading to the degradation of the fuel during storage or posing an operational safety problem with respect to its removal from storage.

The CONFINEMENT BOUNDARY separates areas containing radioactive substances, spent nuclear fuel or high-level waste, and the environment. For the events of concern here, the critical determination is whether the external phenomena or accident has resulted in damage to the loaded fuel cask CONFINEMENT BOUNDARY.

The full CONFINEMENT BOUNDARY is not directly accessible for visible inspection, but would only be affected through an external damage mechanism. Damage of such significance is assessed or inferred through inspection of the cask(s) for VISIBLE DAMAGE.

For EAL 1.1 and EAL 1.2, the results of the ISFSI Safety Analysis Report (SAR) was used to develop the site-specific list of natural phenomena events and accident conditions. These EALs address responses to a dropped cask, a tipped over cask, explosion, missile damage, fire damage or natural phenomena affecting a cask (e.g., seismic event, tornado, etc.).

For EU1.3, 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 ISFSI. Emergency Director judgment is to be based on known conditions and the expected response to mitigating activities within a short time period.

PINGP Basis Reference(s):

1. Prairie Island Independent Spent Fuel Storage Installation Safety Analysis Report, Rev. 9. (Section 3.2)

EU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

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

Operating Mode Applicability: Not applicable

Emergency Action Level:

EU2.1. Security Contingency Event as determined from PINGP Security Plan and reported by the PINGP security shift supervision.

Basis:

This EAL is based on PINGP Security Plans. Security Contingency Events are those that are applicable to this EAL. Security events which do not represent a potential degradation in the level of safety of the ISFSI, are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72.

Reference is made to PINGP security shift supervision because these individuals are the designated personnel qualified and trained to confirm that a security event is occurring or has occurred [Ref. 1]. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the Security Plan.

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)

Table F-0

Recognition Category F

Fission Product Barrier Degradation

INITIATING CONDITION MATRIX

	UE		ALERT		SITE AREA EMERGENCY		GENERAL EMERGENCY
FU1	ANY Loss or ANY Potential Loss of Containment *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	**FA1**	ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	**FS1**	Loss or Potential Loss of ANY Two Barriers *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	**FG1**	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*

NOTES

1. The logic used for these initiating conditions reflects the following considerations:

   - The Fuel Clad Barrier and the RCS Barrier are weighted more heavily than the Containment Barrier. UE ICs associated with RCS and Fuel Clad Barriers are addressed under System Malfunction ICs.

   - At the Site Area Emergency level, there must be some ability to dynamically assess how far present conditions are from the threshold for a General Emergency. For example, if Fuel Clad and RCS Barrier "Loss" EALs existed, that, in addition to offsite dose assessments, would require continual assessments of radioactive inventory and containment integrity. Alternatively, if both Fuel Clad and RCS Barrier "Potential Loss" EALs existed, the Emergency Director would have more assurance that there was no immediate need to escalate to a General Emergency.

   - The ability to escalate to higher emergency classes as an event deteriorates must be maintained. For example, RCS leakage steadily increasing would represent an increasing risk to public health and safety.

2. Fission Product Barrier ICs must be capable of addressing event dynamics. Thus, the EAL Reference Table F-1 states that imminent (i.e., within 2 hours) Loss or Potential Loss should result in a classification as if the affected threshold(s) are already exceeded, particularly for the higher emergency classes.

TABLE F-1

PINGP Emergency Action Level
Fission Product Barrier Reference Table
Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the Loss or Potential Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

Fuel Clad Barrier EALS		RCS Barrier EALS		Containment Barrier EALS	
LOSS	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**
1. Critical Safety Function Status		**1. Critical Safety Function Status**		**1. Critical Safety Function Status**	
Conditions requiring entry into Core-Cooling Red	Conditions requiring entry into Core Cooling-Orange OR Conditions requiring entry into Heat Sink-Red	Not Applicable	Conditions requiring entry into RCS Integrity-Red OR Conditions requiring entry into Heat Sink-Red	Not Applicable	Conditions requiring entry into Containment-Red
OR		**OR**		**OR**	
2. Primary Coolant Activity Level		**2. RCS Leak Rate**		**2. Containment Pressure**	
Coolant Activity GREATER THAN 300 μCi/gm I-131 equivalent	Not Applicable	GREATER THAN available makeup capacity as indicated by a loss of RCS subcooling LESS THAN OR EQUAL TO 20 [35]* degree F *Adverse containment conditions are defined as a containment pressure greater than 5 psig or containment radiation level greater than 1E4 R/Hr.	Unisolable leak exceeding 60 gpm	Rapid unexplained decrease following initial increase OR Containment pressure or sump level response not consistent with LOCA conditions	46 PSIG and increasing OR Containment hydrogen concentration GREATER THAN OR EQUAL TO 6% OR Containment pressure GREATER THAN 23 psig with LESS THAN one full train of depressurization equipment operating

TABLE F-1

PINGP Emergency Action Level

Fission Product Barrier Reference Table

Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the Loss or Potential Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

Fuel Clad Barrier EALS		RCS Barrier EALS		Containment Barrier EALS	
LOSS	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**
OR				**OR**	
3. Core Exit Thermocouple Readings				**3. Core Exit Thermocouple Readings**	
GREATER THAN 1200 degree F	GREATER THAN 700 degree F			Not applicable	Core exit thermocouples in excess of 1200 degrees F and restoration procedures not effective within 15 minutes OR Core exit thermocouples in excess of 700 degrees F with reactor vessel level below 40% RVLIS Full Range and restoration procedures not effective within 15 minutes

TABLE F-1

PINGP Emergency Action Level

Fission Product Barrier Reference Table

Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the Loss or Potential Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

Fuel Clad Barrier EALS		RCS Barrier EALS		Containment Barrier EALS	
LOSS	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**
OR		**OR**		**OR**	
4. Reactor Vessel Water Level		**3. SG Tube Rupture**		**4. SG Secondary Side Release with P-to-S Leakage**	
Not Applicable	Level LESS THAN: • 40% RVLIS Full Range (no RCPs) • 32% RVLIS Dynamic Head Range (1 RCP) • 62% RVLIS Dynamic Head Range (2 RCPs)	SGTR that results in an ECCS (SI) Actuation	Not Applicable	RUPTURED S/G is also FAULTED outside of containment OR Primary-to-Secondary leakrate GREATER THAN 10 gpm with nonisolable steam release from affected S/G to the environment	Not applicable
				OR	
				5. CNMT Isolation Valves Status After CNMT Isolation	
				Containment Isolation Valve(s) not closed AND Downstream pathway to the environment exists after Containment Isolation	Not Applicable
OR		**OR**		**OR**	
5. Containment Radiation Monitoring		**4. Containment Radiation Monitoring**		**6. Significant Radioactive Inventory In Containment**	
Containment rad monitor 1 (2) R-48 or 49 reading GREATER THAN 200 R/hr	Not Applicable	Containment rad monitor 1 (2) R-48 or 49 reading GREATER THAN 7 R/hr	Not Applicable	Not Applicable	Containment rad monitor reading 1 (2) R-48 or 49 GREATER THAN 800 R/hr

TABLE F-1

PINGP Emergency Action Level

Fission Product Barrier Reference Table

Thresholds For LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also an event for multiple events could occur which result in the conclusion that exceeding the Loss or Potential Loss thresholds is imminent (i.e., within 1 to 2 hours). In this imminent loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
FU1 ANY loss or ANY Potential Loss of Containment	FA1 ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS	FS1 Loss or Potential Loss of ANY two Barriers	FG1 Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier

Fuel Clad Barrier EALS		RCS Barrier EALS		Containment Barrier EALS	
LOSS	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**	**LOSS**	**POTENTIAL LOSS**
OR		**OR**		**OR**	
6. Other Indications		5. Other) Indications		7. Other Indications	
RCS letdown line radiation 1(2)R-9 GREATER THAN 10 R/hr	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
OR		**OR**		**OR**	
7. Emergency Director Judgment		6. Emergency Director Judgment		8. Emergency Director Judgment	
Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier		Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the RCS Barrier		Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment barrier	

Basis Information For Table F-1
PINGP Emergency Action Level
Fission Product Barrier Reference Table

FUEL CLAD BARRIER EALs: (1 or 2 or 3 or 4 or 5 or 6 or 7)

The Fuel Clad Barrier is the zircalloy or stainless steel tubes that contain the fuel pellets.

1. Critical Safety Function Status

RED path indicates an extreme challenge to the safety function. ORANGE path indicates a severe challenge to the safety function.
Core Cooling - ORANGE indicates subcooling has been lost and that some clad damage may occur. Core Cooling-ORANGE path is entered if core exit TCs are less than 1200°F, RCS subcooling based on core exit TCs is less than 20°F[35°F] and either:

- No RCPs are running and either core exit TCs are less than 700°F and RVLIS full range is greater than 40%, or core exit TCs are greater than 700°F and RVLIS full range is less than 40%.
- At least one RCP is running and RVLIS Dynamic Head Range is less than 62% (2 RCPs) or 32% (1 RCP).

[Ref. 1]

Heat Sink - RED indicates the ultimate heat sink function is under extreme challenge and thus these two items (Core Cooling – ORANGE or Heat Sink – RED) indicate potential loss of the Fuel Clad Barrier. Heat Sink-Red path is entered if wide range level in both S/Gs is less than 50% and total feedwater flow to S/Gs is less than 200 gpm.

[Ref. 2]

Core Cooling - RED indicates significant superheating and core uncovery and is considered to indicate loss of the Fuel Clad Barrier. Core Cooling-RED path is entered if:

- Core exit TCs are greater than 1200°F, or
- Core exit TCs are greater than 700°F with RCS subcooling based on core exit TCs less than 20°F[35°F], RVLIS full range is less than 40% and no RCPs are running

Critical Safety Function Status Tree (CSFST) setpoints enclosed in brackets (e.g., [35°F], etc.) are used under adverse containment conditions. Adverse containment condition thresholds apply when containment pressure is greater than 5 psig or containment radiation exceeds 1E+4 R/hr.

[Ref. 1, 8]

The barrier loss/potential loss occurs when the plant parameter associated with the CSFST path is reached (not when the operator reads the CSFST in the EOP network). The phrase "Conditions requiring entry into..." is included in these thresholds to emphasize this intent.

2. Primary Coolant Activity Level

This value is 300 µCi/gm I-131 equivalent. Assessment by the NUMARC EAL Task Force indicates that this amount of coolant activity is well above that expected for iodine spikes and corresponds to less than 5% fuel clad damage. This amount of radioactivity indicates significant clad damage and thus the Fuel Clad Barrier is considered lost.

There is no equivalent "Potential Loss" EAL for this item.

3. Core Exit Thermocouple Readings

Core Exit Thermocouple Readings are included in addition to the Critical Safety Functions to include conditions when the CSFs may not be in use (initiation after SI is blocked).

The "Loss" EAL 1200 degrees F reading corresponds to significant superheating of the coolant. This value corresponds to the temperature reading that indicates core cooling - RED in Fuel Clad Barrier EAL #1 which is 1200 degrees F. [Ref. 1]

The "Potential Loss" EAL 700 degrees F reading corresponds to loss of subcooling. This value corresponds to the temperature reading that indicates core cooling - ORANGE in Fuel Clad Barrier EAL #1 which is 700 degrees F. [Ref.1]

4. Reactor Vessel Water Level

There is no "Loss" EAL corresponding to this item because it is better covered by the other Fuel Clad Barrier "Loss" EALs.

The RVLIS values for the "Potential Loss" EAL corresponds to the top of the active fuel under various RCP configurations (2 RCPs running, 1 RCP running, or no RCPs running).

The "Potential Loss" EAL is defined by the Core Cooling - ORANGE path [Ref.1, 2]

5. Containment Radiation Monitoring

The 200 R/hr reading is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the containment. [Ref. 9] The reading is calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 μCi/gm dose equivalent I-131 into the containment atmosphere. [Ref. 4, 5] Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage. This value is higher than that specified for RCS barrier Loss EAL #4. Thus, this EAL indicates a loss of both the fuel clad barrier and a loss of RCS barrier.

There is no "Potential Loss" EAL associated with this item.

6. Other Indications

The RCS Letdown Line Radiation Monitor (R-9) provides indication for this Fuel Cladding loss threshold. An R-9 reading in excess of 10 R/hr indicates damage to the Fuel Cladding barrier. [Ref. 13, 14, 15]

7. Emergency Director Judgment

This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the Fuel Clad barrier is lost or potentially lost. Such a determination should include imminent barrier degradation, barrier monitoring capability and dominant accident sequences.

- Imminent barrier degradation exists if the degradation will likely occur within two hours based on a projection of current safety system performance. The term "imminent" refers to recognition of the inability to reach safety acceptance criteria before completion of all checks.

- Barrier monitoring capability is decreased if there is a loss or lack of reliable indicators. This assessment should include instrumentation operability concerns, readings from portable instrumentation and consideration of offsite monitoring results.

- Dominant accident sequences lead to degradation of all fission product barriers and likely entry to the CSFSTs. The Emergency Director should be mindful of the Loss of AC power (Station Blackout) and ATWS EALs to assure timely emergency classification declarations.

The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that must be considered in this EAL. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.

RCS BARRIER EALs: (1 or 2 or 3 or 4 or 5 or 6)

The RCS Barrier includes the RCS primary side and its connections up to and including the pressurizer safety and relief valves, and other connections up to and including the primary isolation valves.

1. Critical Safety Function Status

RED path indicates an extreme challenge to the safety function derived from appropriate instrument readings, and these CSFs indicate a potential loss of RCS barrier.

RCS Integrity-Red path is entered if cold leg temperature decreases greater than 100°F in the last 60 minutes and RCS pressure/cold leg temperature is to the left of Limit A. The combination of these two conditions indicates the RCS barrier is under extreme challenge. [Ref. 6]Heat Sink-Red path is entered if wide range level in both S/Gs is less than 50% and total feedwater flow to S/Gs is less than 200 gpm. The combination of these two conditions indicates the ultimate heat sink function is under extreme challenge. [Ref. 2]

The barrier potential loss occurs when the plant parameter associated with the CSFST path is reached (not when the operator reads the CSFST in the EOP network). The phrase "Conditions requiring entry into..." is included in these thresholds to emphasize this intent.

There is no "Loss" EAL associated with this item.

2. RCS Leak Rate

The "Loss" EAL addresses conditions where leakage from the RCS is greater than available inventory control capacity such that a loss of subcooling has occurred. The loss of subcooling is the fundamental indication that the inventory control systems are inadequate in maintaining RCS pressure and inventory against the mass loss through the leak.

The "Potential Loss" EAL is based on the inability to maintain normal liquid inventory within the Reactor Coolant System (RCS) by normal operation of the Chemical and Volume Control System which is considered as one positive displacement variable speed charging pump discharging to the charging header. A second charging pump being required is indicative of a substantial RCS leak. 60 gpm is the nominal flow rate capacity for a charging pump. [Ref. 7]

3. SG Tube Rupture

This EAL is intended to address the full spectrum of Steam Generator (SG) tube rupture events in conjunction with Containment Barrier "Loss" EAL #4 and Fuel Clad Barrier EALs. The "Loss" EAL addresses RUPTURED SG(s) for which the leakage is large enough to cause actuation of ECCS (SI). ECCS (SI) actuation is caused by:

- PRZR pressure less than 1830 psig
- Either SG pressure less than 530 psig
- Containment pressure greater than 3.5 psig

This is consistent to the RCS Barrier "Potential Loss" EAL #2. This condition is described by "entry into E-3 required by EOPs". By itself, this EAL will result in the declaration of an Alert. However, if the SG is also FAULTED (i.e., two barriers failed), the declaration escalates to a Site Area Emergency per Containment Barrier "Loss" EAL #4. [Ref. 8]

There is no "Potential Loss" EAL.

4. Containment Radiation Monitoring

The 7 R/hr reading is a value which indicates the release of reactor coolant to the containment. The reading is calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with normal operating concentrations (i.e., within Technical Specifications) into the containment atmosphere. [Ref. 4, 5] This reading is less than that specified for Fuel Clad Barrier EAL #5. Thus, this EAL would be indicative of a RCS leak only. If the radiation monitor reading increased to that specified by Fuel Clad Barrier EAL #5, fuel damage would also be indicated.

The physical location of the containment radiation monitors is such that radiation from a cloud of released RCS gases can be distinguished from radiation from nearby piping and components containing elevated reactor coolant activity, making the use of these monitors for this EAL classification appropriate.There is no "Potential Loss" EAL associated with this item.

5. Other Indications

Instrumentation used for this EAL is consistent with that used in the RCS integrity EOP. There is no additional applicable indication to use for RCS barrier EALs. [Ref. 6]

6. Emergency Director Judgment

This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the RCS barrier is lost or potentially lost. Such a determination should include imminent barrier degradation, barrier monitoring capability and dominant accident sequences.

- <u>Imminent barrier degradation</u> exists if the degradation will likely occur within two hours based on a projection of current safety system performance. The term "imminent" refers to recognition of the inability to reach safety acceptance criteria before completion of all checks.
- <u>Barrier monitoring capability</u> is decreased if there is a loss or lack of reliable indicators. This assessment should include instrumentation operability concerns, readings from portable instrumentation and consideration of offsite monitoring results.
- <u>Dominant accident sequences</u> lead to degradation of all fission product barriers and likely entry to the CSFSTs. The Emergency Director should be mindful of the Loss of AC power (Station Blackout) and ATWS EALs to assure timely emergency classification declarations.

The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that must be considered in this EAL. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.

CONTAINMENT BARRIER EALs: (1 or 2 or 3 or 4 or 5 or 6 or 7 or 8)

The Containment Barrier includes the containment building, its connections up to and including the outermost containment isolation valves. This barrier also includes the main steam, feedwater, and blowdown line extensions outside the containment building up to and including the outermost secondary side isolation valve.

1. Critical Safety Function Status

RED path indicates an extreme challenge to the safety function. Containment-Red path is entered if containment pressure is greater than 46 psig. This pressure is the containment design pressure, and thus represents a potential loss of containment. Conditions leading to a containment RED path result from RCS barrier and/or Fuel Clad Barrier Loss. Thus, this EAL is primarily a discriminator between Site Area Emergency and General Emergency representing a potential loss of the third barrier. [Ref. 9, 10]

The barrier potential loss occurs when the plant parameter associated with the CSFST path is reached (not when the operator reads the CSFST in the EOP network). The phrase "Conditions requiring entry into..." is included in these thresholds to emphasize this intent.

There is no "Loss" EAL associated with this item.

2. Containment Pressure

Rapid unexplained loss of pressure (i.e., not attributable to containment spray or condensation effects) following an initial pressure increase indicates a loss of containment integrity. USAR Appendix K describes containment pressure response for a bounding LOCA. [Ref. 16]

Containment pressure and sump levels should increase as a result of the mass and energy release into containment from a LOCA. Thus, sump level or pressure not increasing indicates containment bypass and a loss of containment integrity.

The 46 PSIG for potential loss of containment is based on the containment design pressure. [Ref. 10]

If hydrogen concentration reaches or exceeds 6% in Containment, an explosive mixture exists. If the combustible mixture ignites, loss of the Containment barrier could occur. To generate such levels of combustible gas, an inadequate core cooling situation must already have existed. As described above, this EAL is primarily a discriminator between Site Area Emergency and General Emergency representing a potential loss of the third barrier. [Ref. 3]

The third potential loss EAL represents a potential loss of containment in that the containment heat removal/depressurization system (but not including containment venting strategies) are either lost or performing in a degraded manner, as indicated by containment pressure greater than the setpoint (23 psig) at which the equipment was supposed to have actuated. A full train of depressurization equipment is one containment spray pump and two containment fan coil units. This equipment will provide 100% of the required cooling capacity during post-accident conditions. Each internal containment spray system consists of a spray pump, spray header, nozzles, valves, piping, instruments, and controls to ensure an operable flow path capable of taking suction from the RWST upon an ESF actuation signal. [Ref. 11, 12]

3. Core Exit Thermocouples

In this EAL, the restoration procedures are those emergency operating procedures that address the recovery of the core cooling critical safety functions. The procedure is considered effective if the temperature is decreasing or if the vessel water level is increasing.

Severe accident analyses (e.g., NUREG-1150) have concluded that function restoration procedures can arrest core degradation within the reactor vessel in a significant fraction of the core damage scenarios, and that the likelihood of containment failure is very small in these events. Given this, it is appropriate to provide a reasonable period to allow function restoration procedures to arrest the core melt sequence. Whether or not the procedures will be effective should be apparent within 15 minutes. The Emergency Director should make the declaration as soon as it is determined that the procedures have been, or will be ineffective. The reactor vessel levels chosen are consistent with the emergency response guides (EOPS) for PINGP[Ref. 1, 3]

Core exit thermocouple readings of 1200°F represent significant superheating of the coolant. This value corresponds to the temperature reading that indicates core cooling - RED in Fuel Clad Barrier EAL #1. Core exit thermocouple readings in excess of 700°F with reactor vessel level below 40% RVLIS Full Range indicate core exit superheating and core uncovery.

The conditions in this potential loss EAL represent an imminent core melt sequence which, if not corrected, could lead to vessel failure and an increased potential for containment failure. In conjunction with the Core Cooling and Heat Sink criteria in the Fuel and RCS barrier columns, this EAL would result in the declaration of a General Emergency -- loss of two barriers and the potential loss of a third. If the function restoration procedures are ineffective, there is no "success" path. [Ref. 1, 3]

There is no "Loss" EAL associated with this item.

4. SG Secondary Side Release With Primary To Secondary Leakage

This "loss" EAL recognizes that SG tube leakage can represent a bypass of the containment barrier as well as a loss of the RCS barrier. The first "loss" EAL addresses the condition in which a RUPTURED steam generator is also FAULTED.. This condition represents a bypass of the RCS and containment barriers. In conjunction with RCS Barrier "loss" EAL #3, this would always result in the declaration of a Site Area Emergency. A faulted S/G means the existence of secondary side leakage that results in an uncontrolled lowering in steam generator pressure or the steam generator being completely depressurized. A ruptured S/G means the existence of primary-to-secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection. Confirmation should be based on diagnostic activities consistent with E-0, Reactor Trip or Safety Injection. [Ref. 8] .

The second "loss" EAL addresses SG tube leaks that exceed 10 gpm in conjunction with a nonisolable release path to the environment from the affected steam generator. The threshold for establishing the nonisolable secondary side release is intended to be a prolonged release of radioactivity from the RUPTURED steam generator directly to the environment. This could be expected to occur when the main condenser is unavailable to accept the contaminated steam (i.e., SGTR with concurrent loss of offsite power and the RUPTURED steam generator is required for plant cooldown or a stuck open relief valve). If the main condenser is available, there may be releases via air ejectors, gland seal exhausters, and other similar controlled, and often monitored, pathways. These pathways do not meet the intent of a nonisolable release path to the environment. These minor releases are assessed using Abnormal Rad Levels / Radiological Effluent ICs. [Ref. 8]

It should be realized that the two "loss" EALs described above could be considered redundant. This was recognized during the development process. The inclusion of an EAL that uses Emergency Procedure commonly used terms like "ruptured and faulted" adds to the ease of the classification process and has been included based on this human factor concern.

A pressure boundary leakage of 10 gpm is used as the threshold in IC SU5.1, RCS Leakage, and is deemed appropriate for this EAL. For smaller breaks, not exceeding the normal charging capacity threshold in RCS Barrier "Potential Loss" EAL #2 (RCS Leak Rate) or not resulting in ECCS actuation in EAL #3 (SG Tube Rupture), this EAL results in a UE. For larger breaks, RCS barrier EALs #2 and #3 would result in an Alert. For SG tube ruptures which may involve multiple steam generators or unisolable secondary line breaks, this EAL would exist in conjunction with RCS barrier "Loss" EAL #3 and would result in a Site Area Emergency. Escalation to General Emergency would be based on "Potential Loss" of the Fuel Clad Barrier.

5. Containment Isolation Valve Status After Containment Isolation

This EAL is intended to address incomplete containment isolation that allows direct release to the environment. It represents a loss of the containment barrier.

The use of the modifier "direct" in defining the release path discriminates against release paths through interfacing liquid systems. The existence of an in-line charcoal filter does not make a release path indirect since the filter is not effective at removing fission noble gases. Typical filters have an efficiency of 95-99% removal of iodine. Given the magnitude of the core inventory of iodine, significant releases could still occur. In addition, since the fission product release would be driven by boiling in the reactor vessel, the high humidity in the release stream can be expected to render the filters ineffective in a short period.

There is no "Potential Loss" EAL associated with this item.

6. Significant Radioactive Inventory in Containment

The 800 R/hr reading is a value which indicates significant fuel damage well in excess of the EALs associated with both loss of Fuel Clad and loss of RCS Barriers. [Ref. 4, 5] A major release of radioactivity requiring offsite protective actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant.

Regardless of whether containment is challenged, this amount of activity in containment, if released, could have such severe consequences that it is prudent to treat this as a potential loss of containment, such that a General Emergency declaration is warranted. NUREG-1228, "Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents," indicates that such conditions do not exist when the amount of clad damage is less than 20%. Accordingly, the EAL threshold corresponds to clad damage of 20%. [Ref. 4, 5]

There is no "Loss" EAL associated with this item.

7. Other (Site-Specific) Indications

Instrumentation used for this EAL is consistent with that used in the Containment integrity EOP. There is no additional applicable indication to use that may unambiguously indicate loss or potential loss of the containment barrierVenting of the containment during an emergency is not used as a means of preventing catastrophic failure. [Ref. 9]

8. Emergency Director Judgment

This EAL addresses any other factors that are to be used by the Emergency Director in determining whether the Containment barrier is lost or potentially lost. Such a determination should include imminent barrier degradation, barrier monitoring capability and dominant accident sequences.

- Imminent barrier degradation exists if the degradation will likely occur within two hours based on a projection of current safety system performance. The term "imminent" refers to recognition of the inability to reach safety acceptance criteria before completion of all checks.

- Barrier monitoring capability is decreased if there is a loss or lack of reliable indicators. This assessment should include instrumentation operability concerns, readings from portable instrumentation and consideration of offsite monitoring results.

- Dominant accident sequences lead to degradation of all fission product barriers and likely entry to the CSFSTs. The Emergency Director should be mindful of the Loss of AC power (Station Blackout) and ATWS EALs to assure timely emergency classification declarations.

The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that must be considered in this EAL. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.

PINGP Basis Reference(s):

1. F-0.2 Core Cooling
2. F-0.3 Heat Sink
3. FR-C.1 Response to Inadequate Core Cooling
4. F3-17 Core Damage Assessment
5. Memo to EAL Upgrade Project File from Mel Agen dated 7/31/04 "Containment Rad Monitors & Fuel Cladding Damage Based on USAR"
6. F-0.4 Integrity
7. USAR Section 10.2.3
8. E-0 Reactor Trip or Safety Injection

9. F-0.5 Containment

10. USAR Section 5.2.1

11. Technical Specifications Table 3.3.2-1

12. Technical Specifications B3.6.5

13. Memo to EAL Upgrade Project File from Mel Agen dated 10/11/04 "R-9 Rad Monitors & Fuel Cladding Damage Based on USAR"

14. USAR Section 10.2.3.3.7

15. USAR Appendix D

16. USAR Appendix K

TABLE H-0

Recognition Category H

Hazards and Other Conditions Affecting Plant Safety

INITIATING CONDITION MATRIX

UE		ALERT		SITE AREA EMERGENCY		GENERAL EMERGENCY	
HU1	Natural and Destructive Phenomena Affecting the PROTECTED AREA. *Op. Modes: All*	**HA1**	Natural and Destructive Phenomena Affecting the Plant VITAL AREA. *Op. Modes: All*				
HU2	FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection. *Op. Modes: All*	**HA2**	FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown. *Op. Modes: All*				
HU3	Release of Toxic or Flammable Gases Deemed Detrimental to Safe Operation of the Plant. *Op. Modes: All*	**HA3**	Release of Toxic or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Safety Systems Required to Establish or Maintain Safe Shutdown. *Op. Modes: All*				
HU4	Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant. *Op. Modes: All*	**HA4**	Confirmed Security Event in a Plant PROTECTED AREA. *Op. Modes: All*	**HS1**	Confirmed Security Event in a Plant VITAL AREA. *Op. Modes: All*	**HG1**	Security Event Resulting in Loss Of Physical Control of the Facility. *Op. Modes: All*
HU5	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a UE. *Op. Modes: All*	**HA6**	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert. *Op. Modes: All*	**HS3**	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency. *Op. Modes: All*	**HG2**	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency. *Op. Modes: All*
		HA5	Control Room Evacuation Has Been Initiated. *Op. Modes: All*	**HS2**	Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established. *Op. Modes: All*		

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HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU1

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Natural and Destructive Phenomena Affecting the PROTECTED AREA.

Operating Mode Applicability: All

Emergency Action Levels: (HU1.1 or HU1.2 or HU1.3 or HU1.4 or HU1.5 or HU1.6or HU1.7)

HU1.1. Earthquake felt in plant as indicated by VALID "Event Alarm" on Seismic Monitoring Panel.

HU1.2. Report by plant personnel of tornado or high winds GREATER THAN 95 mph striking within PROTECTED AREA boundary.

HU1.3. Vehicle crash into plant structures or systems within PROTECTED AREA boundary.

HU1.4. Report by plant personnel of an unanticipated EXPLOSION within PROTECTED AREA boundary resulting in VISIBLE DAMAGE to permanent structure or equipment.

HU1.5. Report of turbine failure resulting in casing penetration or damage to turbine or generator seals.

HU1.6. Uncontrolled flooding in following areas of the plant that has the potential to affect safety related equipment needed for the current operating mode (Table H-1)

HU1.7. High or low river water level occurrences affecting the PROTECTED AREA as indicated by:

River intake level GREATER THAN 692 ft MSL

OR

River intake level LESS THAN 669.5 ft MSL.

Table H-1 Plant Areas										
Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				
*Also consider areas contiguous to these										

Basis:

UE 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. Escalation of the event to an Alert occurs when the magnitude of the event is sufficient to result in damage to equipment contained in the specified location.

HU1.1is based on damage that may be caused to some portions of the site, but should not affect ability of safety functions to operate. Method of detection is based on seismic instrumentation and validated by Operator assessment [Ref. 1, 2, 3]. PINGP seismic monitoring instrumentation will record and annunciate ("Event Alarm") at seismic activity levels exceeding accelerations of 0.01 g vertical or 0.01 g horizontal. As defined in the EPRI-sponsored "Guidelines for Nuclear Plant Response to an Earthquake", dated October 1989, a *"felt earthquake"* is:

> An earthquake of sufficient intensity such that: (a) the vibratory ground motion is felt at the nuclear plant site and recognized as an earthquake based on a consensus of control room operators on duty at the time, and (b) for plants with operable seismic instrumentation, the seismic switches of the plant are activated. For most plants with seismic instrumentation, the seismic switches are set at an acceleration of about 0.01g.

HU1.2 is based on the assumption that a tornado striking (touching down) or high winds within the PROTECTED AREA may have potentially damaged plant structures containing functions or systems required for safe shutdown of the plant. The high wind value is based on USAR design basis. All structures are designed to withstand the maximum potential loadings resulting from a wind speed of 100 mph. [Ref. 4]. However, winds greater than 100 mph cannot be read from instrumentation because full-scale readings only go up to near 100 mph but not greater than or equal to 100 mph. 95 mph was chosen as the classification threshold, as this reading will be on-scale. If such damage is confirmed visually or by other in-plant indications, the event may be escalated to Alert.

HU1.3 is intended to address crashes of any vehicle type (land, air or water) large enough to cause significant damage to plant structures containing functions and systems required for safe shutdown of the plant. If the crash is confirmed to affect a plant VITAL AREA, the event may be escalated to Alert.

For HU1.4 only those EXPLOSIONs of sufficient force to damage permanent structures or equipment within the PROTECTED AREA should be considered. 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.

HU1.5 is intended to address main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the turbine generator. Of major concern is the potential for leakage of combustible fluids (lubricating oils) and gases (hydrogen cooling) to the plant environs. Actual FIREs and flammable gas build up are appropriately classified via HU2 and HU3. Generator seal damage observed after generator purge does not meet the intent of this EAL because it did not impact normal operation of the plant. This EAL is consistent with the definition of a UE while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment. Escalation of the emergency classification is based on potential damage done by missiles generated by the failure or in conjunction with a steam generator tube rupture. These latter events would be classified by the radiological ICs or Fission Product Barrier ICs.

HU1.6 addresses the effect of flooding caused by internal events such as component failures, equipment misalignment, or outage activity mishaps. The Plant Areas listed in Table H-1, column HU1.6 include those areas that contain systems required for safe shutdown of the plant, that are not designed to be wetted or submerged. Escalation of the emergency classification is based on the damage caused or by access restrictions that prevent necessary plant operations or systems monitoring. [Ref. 6].

HU1.7 covers high river water level conditions that could be a precursor of more serious events as well as low river water level conditions which may threaten operability of plant cooling systems. A river level of 669.5 ft Mean Sea Level (MSL) corresponds to the trip of the normal operating cooling water pumps (11/12) on low level. [Ref. 5].

The Prairie Island plant is designed such that all areas critical to nuclear safety are protected against the effects of the probable maximum flood and associated maximum wave run-up. Plant operating procedures and emergency plans state the flood stage elevations at which plant protective measures must be taken. These procedures will require placing the unit in Mode 3, Hot Standby, when flood stage elevations exceed 692 feet at the plant site. [Ref. 7].

PINGP Basis Reference(s):

1. AB-3 Earthquakes
2. C47023-0603 Event Alarm
3. Plant Modification 03MP01
4. AB-2 Tornado/Severe Thunderstorm/High Winds
5. C47020-0106 11(12) Cooling Water pump Locked Out
6. C41.5 – AR 26, ERCS Operating Procedure Alarms Summary/Displays/Responses

7. AB-4 Flood

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection.

Operating Mode Applicability: All

Emergency Action Level:

HU2.1. FIRE in buildings or areas contiguous (in actual contact with or immediately adjacent) to any Table H-1 area not extinguished within 15 minutes of control room notification or verification of a control room alarm.

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				

*Also consider areas contiguous to these

Basis:

The purpose of this IC is to address the magnitude and extent of FIREs that may be potentially significant precursors to damage to safety systems. As used here, detection is visual observation and report by plant personnel or sensor alarm indication. The 15 minute time period begins with a credible notification that a FIRE is occurring, or indication of a VALID fire detection system alarm. Verification of a fire detection system alarm includes actions that can be taken with the control room or other nearby site-specific location 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). The applicable areas are limited and apply to buildings and areas contiguous (in actual contact with or immediately adjacent) to plant VITAL AREAs or other significant buildings or areas [Ref. 1, 2]. The intent of this IC is not to include buildings (i.e., warehouses) or areas that are not contiguous (in actual contact with or immediately adjacent) to plant VITAL AREAs. This EAL excludes FIREs within non-contiguous administration buildings, waste-basket FIREs and other small FIREs of no safety consequence.

Escalation to a higher emergency class is by IC HA2, "FIRE Affecting the Operability of Plant Safety Systems Required for the Current Operating Mode".

PINGP Basis Reference(s):

1. USAR Section 12.2.1.1 Classification of Structures and Equipment
2. USAR Table 12.2-1 Classification of Structures, Systems and Components

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU3

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Release of Toxic or Flammable Gases Deemed Detrimental to Normal Operation of the Plant.

Operating Mode Applicability: All

Emergency Action Levels: (HU3.1 or HU3.2)

HU3.1. Report or detection of toxic or flammable gases that has or could enter the site area boundary in amounts that can affect NORMAL PLANT OPERATIONS.

HU3.2. Report by Local, County or State Officials for evacuation or sheltering of site personnel based on an offsite event.

Basis:

This IC is based on the existence of uncontrolled releases of toxic or flammable gas that may enter the site boundary and affect normal plant operations. It is intended that releases of toxic or flammable gases are of sufficient quantity, and the release point of such gases is such that normal plant operations would be affected. This would preclude small or incidental releases, or releases that do not impact structures needed for plant operation. The EALs are intended to not require significant assessment or quantification. The IC assumes an uncontrolled process that has the potential to affect plant operations, or personnel safety.

Escalation of this EAL is via HA3, which involves a quantified release of toxic or flammable gas affecting VITAL AREAs.

PINGP Basis Reference(s):

None

HU4

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant.

Operating Mode Applicability: All

Emergency Action Levels: (HU4.1 or HU4.2)

HU4.1. Security Shift Supervision reports ANY of the following:
- Suspected SABOTAGE device discovered within the plant PROTECTED AREA
- Suspected SABOTAGE device discovered outside the PROTECTED AREA or in the plant switchyard
- Confirmed tampering with safety-related equipment
- A HOSTAGE/EXTORTION situation that disrupts NORMAL PLANT OPERATIONS
- CIVIL DISTURBANCE or STRIKE ACTION which disrupts NORMAL PLANT OPERATIONS
- Internal disturbance that is not a short lived or that is not a harmless outburst involving ANY individuals within the PROTECTED AREA
- Malevolent use of a vehicle outside the PROTECTED AREA which disrupts NORMAL PLANT OPERATIONS

HU4.2. A credible site specific security threat notification.

Basis:

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

HU4.1 is based on PINGP Security Plans. Security Contingency Events are those that are applicable to this EAL. Security events which do not represent a potential degradation in the level of safety of the plant, are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72. Examples of security events that indicate Potential Degradation in the Level of Safety of the Plant are provided below for consideration.

Consideration was given to the following types of events when evaluating an event against the criteria of the site specific Security Contingency Plan: The PINGP Security Plan considers these types of events: SABOTAGE, HOSTAGE / EXTORTION, CIVIL DISTURBANCE, and STRIKE ACTION.

INTRUSION into the plant PROTECTED AREA by a HOSTILE FORCE would result in EAL escalation to an ALERT.

The intent of HU4.2 is to ensure that appropriate notifications for the security threat are made in a timely manner. Only the plant to which the specific threat is made need declare the Unusual Event.

The determination of "credible" is made through use of information found in the PINGP Security Plan.

A higher initial classification could be made based upon the nature and timing of the threat and potential consequences. The licensee shall consider upgrading the emergency response status and emergency classification in accordance with the PINGP Security Plan and Emergency Plan.

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)
2. NMC fleet Security Threat Assessment Policy, SE 0018

HU5

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a UE.

Operating Mode Applicability: All

Emergency Action Level:

HU5.1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or 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.

Basis:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the UE emergency class.

From a broad perspective, one area that may warrant Emergency Director judgment is related to likely or actual breakdown of site-specific event mitigating actions. Examples to consider include inadequate emergency response procedures, transient response either unexpected or not understood, failure or unavailability of emergency systems during an accident in excess of that assumed in accident analysis, or insufficient availability of equipment and/or support personnel.

PINGP Basis Reference(s):

None

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA1

Initiating Condition -- ALERT

Natural and Destructive Phenomena Affecting the Plant VITAL AREA.

Operating Mode Applicability: All

Emergency Action Levels: (HA1.1 or HA1.2 or HA1.3 or HA1.4 or HA1.5 or HA1.6)

HA1.1. Seismic Event GREATER THAN Operating Basis Earthquake (OBE) as indicated by "OBE" alarm on Seismic Monitoring Panel.

HA1.2. Tornado or high winds GREATER THAN 95 mph within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures / equipment or Control Room indication of degraded performance of those systems (Table H-1).

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				
*Also consider areas contiguous to these										

HA1.3. Vehicle crash within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures or equipment therein or Control Room indication of degraded performance of those systems (Table H-1).

HA1.4. Turbine failure-generated missiles result in any VISIBLE DAMAGE to or penetration of any of the following plant areas (Table H-1).

HA1.5. Uncontrolled flooding in any Table H-1 area of the plant that results in degraded safety system performance as indicated in the control room or that creates industrial safety hazards (e.g., electric shock) that precludes access necessary to operate or monitor safety equipment.

HA1.6. High or low river water level occurrences affecting the PROTECTED AREA as indicated by:

River intake level GREATER THAN 698 ft MSL

OR

River intake level LESS THAN 666.5 ft MSL.

Basis:

The EALs in this IC escalate from the UE EALs in HU1 in that the occurrence of the event has resulted in VISIBLE DAMAGE to plant structures or areas containing equipment necessary for a safe shutdown (Table H-1), or has caused damage to the safety systems in those structures evidenced by control indications of degraded system response or performance. The occurrence of VISIBLE DAMAGE and/or degraded system response is intended to discriminate against lesser events. The initial "report" should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this EAL to assess the actual magnitude of the damage. The significance here is not that a particular system or structure was damaged, but rather, that the event was of sufficient magnitude to cause this degradation. Escalation to higher classifications occur on the basis of other ICs (e.g., System Malfunction).

HA1.1 is based on the USAR design basis operating basis earthquake (OBE). Seismic monitoring instrumentation will annunciate OBE levels exceeded ("OBE Exceeded" Alarm) at vertical or horizontal accelerations greater than the PINGP OBE (0.06g and 0.04g) design values between 2 and 10 Hertz. Seismic events of this magnitude can result in a plant VITAL AREA being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems. [Ref. 1, 2, 3]

HA1.2 is based on the USAR design basis. All structures are designed to withstand the maximum potential loadings resulting from a wind speed of 100 mph. [Ref. 4]. However, winds greater than 100 mph cannot be read from instrumentation because full-scale readings only go up to near 100 mph but not greater than or equal to 100 mph. 95 mph was chosen as the classification threshold, as this will be on-scale. Wind loads of this magnitude can cause damage to safety functions. The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA.

HA1.3 is intended to address crashes of vehicle types large enough to cause significant damage to plant structures containing functions and systems required for safe shutdown of the plant. The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA.

HA1.4 is intended to address the threat to safety related equipment imposed by missiles generated by main turbine rotating component failures. The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA, including safe shutdown equipment. This EAL is, therefore, consistent with the definition of an ALERT in that if missiles have damaged or penetrated areas containing safety-related equipment the potential exists for substantial degradation of the level of safety of the plant.

HA1.5 addresses the effect of internal flooding that has resulted in degraded performance of systems affected by the flooding, or has created industrial safety hazards (e.g., electrical shock) that preclude necessary access to operate or monitor safety equipment. The inability to operate or monitor safety equipment represents a potential for substantial degradation of the level of safety of the plant. This flooding may have been caused by internal events such as component failures, equipment misalignment, or outage activity mishaps. The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA, including safe shutdown equipment. The site-specific areas includes those areas that contain systems required for safe shutdown of the plant, that are not designed to be wetted or submerged.

HA1.6 covers flooding. This EAL can be a precursor of more serious events. River water level greater than 698 ft MSL is the highest level at which the transformers remain functional. River water level less than666.5 ft is the level corresponding to the loss of Lock & Dam #3 and threatens the availability of the ultimate heat sink [Ref. 5, 6].

PINGP Basis Reference(s):

1. AB-3 Earthquakes
2. C47023-0603 Event Alarm
3. Plant Modification 03MP01
4. AB-2 Tornado/Severe Thunderstorm/High Winds
5. USAR Section 2.4 Hydrology
6. AB-4 Flood

Initiating Condition – ALERT

FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.

Operating Mode Applicability: All

Emergency Action Level:

HA2.1. FIRE or EXPLOSION in any of the following areas (Table H-1):

AND

Affected system parameter indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area.

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				

*Also consider areas contiguous to these

Basis:

The areas listed in Table H-1 contain equipment or material applicable to the NEI definition of VITAL AREA, including safe shutdown equipment. [Ref. 1, 2]. This makes it easier to determine if the FIRE or EXPLOSION is potentially affecting one or more redundant trains of safety systems. Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels / Radiological Effluent, or Emergency Director Judgment ICs.

This EAL addresses a FIRE / EXPLOSION and not the degradation in performance of affected systems. System degradation is addressed in the System Malfunction EALs. The reference to damage of systems is used to identify the magnitude of the FIRE / EXPLOSION and to discriminate against minor FIREs / EXPLOSIONs. The reference to safety systems is included to discriminate against FIREs / EXPLOSIONs in areas having a low probability of affecting safe operation. The significance here is not that a safety system was degraded but the fact that the FIRE / EXPLOSION was large enough to cause damage to these systems. Thus, the designation of a single train was intentional and is appropriate when the FIRE / EXPLOSION is large enough to affect more than one component.

This situation is not the same as removing equipment for maintenance that is covered by a plant's Technical Specifications. Removal of equipment for maintenance is a planned activity controlled in accordance with procedures and, as such, does not constitute a substantial degradation in the level of safety of the plant. A FIRE / EXPLOSION is an UNPLANNED activity and, as such, does constitute a substantial degradation in the level of safety of the plant. In this situation, an Alert classification is warranted.

The inclusion of a "report of VISIBLE DAMAGE" should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this EAL to assess the actual magnitude of the damage. The occurrence of the EXPLOSION with reports of evidence of damage is sufficient for declaration. The declaration of an Alert and the activation of the Technical Support Center will provide the Emergency Director with the resources needed to perform these damage assessments. The Emergency Director also needs to consider any security aspects of the EXPLOSIONs, if applicable.

PINGP Basis Reference(s):

1. USAR Section 12.2.1.1 Classification of Structures and Equipment
2. USAR Table 12.2-1 Classification of Structures, Systems and Components

HA3

Initiating Condition -- ALERT

Release of Toxic or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Establish or Maintain Safe Shutdown.

Operating Mode Applicability: All

Emergency Action Levels: (HA3.1 or HA3.2)

HA3.1. Report or detection of toxic gases within or contiguous to Table H-1 areas in concentrations that may result in an atmosphere IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).

Table H-1 Plant Areas

Area	HU1.6	HU2.1*	HA1.2	HA1.3	HA1.4	HA1.5	HA2.1	HA3.1*	HA3.2*	RA3.2
Shield/Containment Building	X	X	X	X	X	X	X	X	X	X
Auxiliary Building	X	X	X	X	X	X	X	X	X	X
D5/D6 Diesel Generator Building	X	X	X	X	X	X	X	X	X	X
Plant Screenhouse	X	X	X	X	X	X	X	X	X	X
Control Room/Relay Room	X	X	X	X	X	X	X	X	X	X
Turbine Building	X	X	X	X	X	X	X	X	X	X
Condensate Storage Tanks			X	X	X	X				

*Also consider areas contiguous to these

HA3.2. Report or detection of gases in concentration GREATER THAN the LOWER FLAMMABILITY LIMIT within or contiguous to Table H-1 areas.

Basis:

This IC is based on gases that affect the safe operation of the plant. This IC applies to buildings and areas contiguous to plant VITAL AREAs or other significant buildings or areas [Ref. 1, 2]. The intent of this IC is not to include buildings (e.g., warehouses) or other areas that are not contiguous or immediately adjacent to plant VITAL AREAs. It is appropriate that increased monitoring be done to ascertain whether consequential damage has occurred. Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels / Radioactive Effluent, or Emergency Director Judgment ICs.

HA3.1 is met if measurement of toxic gas concentration results in an atmosphere that is IDLH within a VITAL AREA or any area or building contiguous to VITAL AREA. Exposure to an IDLH atmosphere will result in immediate harm to unprotected personnel, and would preclude access to any such affected areas.

HA3.2 is met when the flammable gas concentration in a VITAL AREA or any building or area contiguous to a VITAL AREA exceed the LOWER FLAMMABILITY LIMIT. Flammable gasses, such as hydrogen and acetylene, are routinely used to maintain plant systems (hydrogen) or to repair equipment/components (acetylene - used in welding). This EAL addresses concentrations at which gases can ignite/support combustion. An uncontrolled release of flammable gasses within a facility structure has the potential to affect safe operation of the plant by limiting either operator or equipment operations due to the potential for ignition and resulting equipment damage/personnel injury. Once it has been determined that an uncontrolled release is occurring, then sampling must be done to determine if the concentration of the released gas is within this range.

PINGP Basis Reference(s):

1. USAR Section 12.2.1.1 Classification of Structures and Equipment
2. USAR Table 12.2-1 Classification of Structures, Systems and Components

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA4

Initiating Condition -- ALERT

Confirmed Security Event in a Plant PROTECTED AREA.

Operating Mode Applicability: All

Emergency Action Levels: (HA4.1 or HA4.2)

HA4.1. INTRUSION into the plant PROTECTED AREA by a HOSTILE FORCE.

HA4.2. Security Shift Supervision reports any of the following:

- SABATOGE device discovered in the plant PROTECTED AREA
- Standoff attack on the PROTECTED AREA by a HOSTILE FORCE (i.e., Sniper)
- ANY security event of increasing severity that persists for > 30 min.:
  - Credible BOMB threats
  - HOSTAGE/EXTORTION
  - Suspicious FIRE or EXPLOSION
  - Significant Security System Hardware Failure
  - Loss of Guard Post Contact

Basis:

This class of security events represents an escalated threat to plant safety above that contained in the UE.

HA4.1 A confirmed INTRUSION report is satisfied if physical evidence indicates the presence of a HOSTILE FORCE within the PROTECTED AREA.

HA4.2 The Security Plan identifies numerous events/conditions that constitute a threat/compromise to station security. Only those events that involve actual or potential substantial degradation to the level of safety of the plant are considered. The PINGP Security Plan includes consideration of: SABOTAGE, HOSTAGE / EXTORTION, and STRIKE ACTION.The following events would not normally meet this requirement; (e.g., Failure by a Member of the Security Force to carry out an assigned/required duty, internal disturbances, loss/compromise of safeguards materials or strike actions).

INTRUSION into a VITAL AREA by a HOSTILE FORCE will escalate this event to a Site Area Emergency.

Reference is made to PINGP Security Shift Supervision because these individuals are the designated personnel on-site qualified and trained to confirm that a security event is occurring or has occurred. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the plant Security Plan.

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)
2. <u>NMC fleet Security Threat Assessment Policy, SE 0018</u>

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA5

Initiating Condition -- ALERT

Control Room Evacuation Has Been Initiated.

Operating Mode Applicability: All

Emergency Action Level:

HA5.1. Entry into 1(2)C1.3 AOP-1 Shutdown from Outside the Control Room or F-5 Appendix B Control Room Evacuation (Fire) for control room evacuation.

Basis:

With the control room evacuated, additional support, monitoring and direction through the Technical Support Center and/or other emergency response facility is necessary. 1(2)C1.3 AOP-1, Shutdown from Outside the Control Room, and F-5 Appendix B, Control Room Evacuation (Fire), provide specific instructions for evacuating the Control Room and establishing plant control at the remote Hot Shutdown Panels. Inability to establish plant control from outside the control room will escalate this event to a Site Area Emergency.

PINGP Basis Reference(s):

1. 1C1.3 & 2C1.3 AOP-1 Shutdown from Outside the Control Room
2. F-5 Appendix B Control Room Evacuation (Fire)

HA6

Initiating Condition -- ALERT

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert.

Operating Mode Applicability: All

Emergency Action Level:

HA6.1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely 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.

Basis:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Alert emergency class.

PINGP Basis Reference(s):

None

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS1

Initiating Condition – SITE AREA EMERGENCY

Confirmed Security Event in a Plant VITAL AREA.

Operating Mode Applicability: All

Emergency Action Levels: (HS1.1 or HS1.2)

HS1.1. INTRUSION into the plant VITAL AREA by a HOSTILE FORCE.

HS1.2. Security Shift Supervision reports ANY of the following:

- A security event that results in the loss of control of ANY VITAL AREAS (other than Control Room)
- Imminent loss of physical control of the facility (remote shutdown capability) due to a security event
- A confirmed SABOTAGE device discovered in a VITAL AREA

Basis:

This class of security events represents an escalated threat to plant safety above that contained in the Alert IC in that a HOSTILE FORCE has progressed from the PROTECTED AREA to a VITAL AREA.

Consideration is given to the following types of events when evaluating an event against the criteria of the PINGP Security Plan: SABOTAGE and HOSTAGE / EXTORTION. The PINGP Security Plan identifies numerous events/conditions that constitute a threat/compromise to a station's security. Only those events that involve actual or likely major failures of plant functions needed for protection of the public need to be considered. The following events would not normally meet this requirement; (e.g., Failure by a Member of the Security Force to carry out an assigned/required duty, internal disturbances, loss/compromise of safeguards materials or strike actions).

Loss of plant control would escalate this event to a GENERAL EMERGENCY.

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

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)
2. NMC fleet Security Threat Assessment Policy, SE 0018

HS2

Initiating Condition – SITE AREA EMERGENCY

Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established.

Operating Mode Applicability: All

Emergency Action Level:

HS2.1. Control room evacuation has been initiated.

AND

Control of the plant cannot be established per 1(2)C1.3 AOP-1, Shutdown from Outside the Control Room or F-5 Appendix B, Control Room Evacuation (Fire) within 15 minutes.

Basis:

Expeditious transfer of safety systems has not occurred but fission product barrier damage may not yet be indicated. The intent of this IC is to capture those events where control of the plant cannot be reestablished in a timely manner. This time should not exceed 15 minutes. The determination of whether or not control is established at the remote shutdown panel is based on Emergency Director (ED) judgment. The ED is expected to make a reasonable, informed judgment within the time for transfer that the operator has control of the plant from the remote shutdown panel.

1(2)C1.3 AOP-1, Shutdown from Outside the Control Room and F-5 Appendix B, Control Room Evacuation (Fire), provide specific instructions for evacuating the Control Room and establishing plant control at the remote Hot Shutdown Panels.

The intent of the EAL is to establish control of important plant equipment and knowledge of important plant parameters in a timely manner. Primary emphasis should be placed on those components and instruments that supply protection for and information about safety functions. Typically, these safety functions are reactivity control (ability to shutdown the reactor and maintain it shutdown), RCS inventory (ability to cool the core), and secondary heat removal (ability to maintain a heat sink).

Escalation of this event, if appropriate, would be by Fission Product Barrier Degradation, Abnormal Rad Levels/Radiological Effluent, or Emergency Director Judgment ICs.

PINGP Basis Reference(s):

1. 1C1.3 & 2C1.3 AOP-1 Shutdown from Outside the Control Room
2. F-5 Appendix B Control Room Evacuation (Fire)

HS3

Initiating Condition – SITE AREA EMERGENCY

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency.

Operating Mode Applicability: All

Emergency Action Level:

HS3.1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

Basis:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency class description for Site Area Emergency.

PINGP Basis Reference(s):

None

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HG1

Initiating Condition – GENERAL EMERGENCY

Security Event Resulting in Loss Of Physical Control of the Facility.

Operating Mode Applicability: All

Emergency Action Level:

HG1.1. A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions as indicated by loss of physical control of EITHER:

A VITAL AREA such that operation of equipment required for safe shutdown is lost

OR

Spent fuel pool cooling systems if imminent fuel damage is likely (e.g. freshly off-loaded reactor core in the pool).

Basis:

This IC encompasses conditions under which a HOSTILE FORCE has taken physical control of VITAL AREAs (containing vital equipment or controls of vital equipment) required to maintain safety functions and control of that equipment cannot be transferred to and operated from another location. These safety functions are reactivity control (ability to shut down the reactor and keep it shutdown) RCS inventory (ability to cool the core), and secondary heat removal (ability to maintain a heat sink). Loss of physical control of the control room or remote shutdown capability alone may not prevent the ability to maintain safety functions. If control of the plant equipment necessary to maintain safety functions can be transferred to another location, then the above initiating condition is not met.

This EAL addresses loss of physical control of spent fuel pool cooling systems because loss of spent fuel pool cooling could result in significant fuel damage, especially if a reactor core has been recently offloaded..

PINGP Basis Reference(s):

1. PINGP Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program. (Not included, safeguards)

HG2

Initiating Condition – GENERAL EMERGENCY

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency.

Operating Mode Applicability: All

Emergency Action Level:

HG2.1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Basis:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the General Emergency class.

PINGP Basis Reference(s):

None

Table S-0

Recognition Category S

System Malfunction

INITIATING CONDITION MATRIX

UE	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
SU1 Loss of All Offsite Power to Essential Buses for GREATER THAN 15 Minutes. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SA5** AC power capability to essential buses reduced to a single power source for GREATER THAN 15 minutes such that any additional single failure would result in station blackout. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SS1** Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Buses. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SG1** Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power to Essential Buses. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*
	SA2 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip Was Successful. *Op. Modes: Power Operation, Startup, Hot Standby*	**SS2** Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip Was NOT Successful. *Op. Modes: Power Operation, Startup*	**SG2** Failure of the Reactor Protection System to Complete an Automatic Trip and Manual Trip was NOT Successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core. *Op. Modes: Power Operation, Startup*
SU2 Inability to Reach Required Shutdown Within Technical Specification Limits. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SA3** *Deleted*	**SS4** Complete Loss of Heat Removal Capability. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	
SU3 UNPLANNED Loss of Most or All Safety System Annunciation or Indication in The Control Room for GREATER THAN 15 Minutes *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SA4** UNPLANNED Loss of Most or All Safety System Annunciation or Indication in Control Room With Either (1) a SIGNIFICANT TRANSIENT in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	**SS6** Inability to Monitor a SIGNIFICANT TRANSIENT in Progress. *Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown*	

Recognition Category S

System Malfunction

INITIATING CONDITION MATRIX

SU7 *Deleted*

SU4 Fuel Clad Degradation.
Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown

SU5 RCS Leakage.
Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown

SU6 UNPLANNED Loss of All Onsite or Offsite Communications Capabilities.
Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown

SU8 Inadvertent Criticality.
Op Modes: Hot Standby, Hot Shutdown

SA1 *Deleted*

SS3 Loss of All Vital DC Power.
Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown

SS5 *Deleted*

SU1

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Loss of All Offsite Power to Essential Buses for GREATER THAN 15 Minutes.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SU1.1. Loss of all offsite power to both Buses 15(25) and 16(26) for GREATER THAN 15 minutes.

AND

At least two emergency generators are supplying power to emergency busses.

Basis:

Prolonged loss of AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete Loss of AC Power (e.g., Station Blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This EAL is indicated by the loss of all offsite AC power to the 4.16KV safeguards buses. Safeguards Buses 15(25) and 16(26) are the Unit 1(2) 4.16KV essential/emergency buses. PINGP emergency diesel generators (EDG) D1 (5) and D2 (6) are the "emergency generators". Two EDGs must be supplying power, one generator available for each bus.

No credit is provided for restoration of power to a non-affected unit bus. However, bus ties between buses 15 (Unit 1) and 25 (Unit 2) and between buses 16 (Unit 1) and 26 (Unit 2) are available to provide AC power to the affected unit safeguards buses from the unaffected unit and therefore PINGP takes credit for the redundant power source for this IC. However, the inability to effect the cross-tie within 15 minutes warrants declaring a UE.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

SU2

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Inability to Reach Required Shutdown Within Technical Specification Limits.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SU2.1. Plant is not brought to required operating mode within Technical Specifications LCO Action Statement Time.

Basis:

Limiting Conditions of Operation (LCOs) require the plant to be brought to a required shutdown mode when the Technical Specification required configuration cannot be restored. Depending on the circumstances, this may or may not be an emergency or precursor to a more severe condition. In any case, the initiation of plant shutdown required by the PINGP Technical Specifications requires a four-hour report under 10 CFR 50.72 (b)(2) Four-hour reports Non-emergency events. The plant is within its safety envelope when being shut down within the allowable action statement time in the Technical Specifications. An immediate UE is required when the plant is not brought to the required operating mode within the allowable action statement time in the Technical Specifications. Declaration of a UE is based on the time at which the LCO-specified action statement time period elapses under the site Technical Specifications and is not related to how long a condition may have existed. Other required Technical Specification shutdowns that involve precursors to more serious events are addressed by other System Malfunction, Hazards, or Fission Product Barrier Degradation ICs.

PINGP Basis Reference(s):

None

SYSTEM MALFUNCTION

SU3

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of Most or All Safety System Annunciation or Indication in The Control Room for Greater Than 15 Minutes

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SU3.1. UNPLANNED loss of most or all annunciators or indicators associated with safety systems for GREATER THAN 15 minutes.

- Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2) NIS Racks I, II, III, IV, and ERCS Alarms

Basis:

This IC and its associated EAL are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment.

"Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

Recognition of the availability of computer based indication equipment is considered (e.g., SPDS, plant computer, etc.) via the reference to Emergency Response Computer System (ERCS) alarms.

Quantification of "Most" is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions.

The focus of the EAL is on annunciators. The plant design also provides redundant safety system and accident monitoring indication powered from separate uninterruptable power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This is addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the UE is based on SU2 "Inability to Reach Required Shutdown Within Technical Specification Limits."

The scope of annunciators and indicators for this EAL is all-inclusive, thus it includes those identified and used in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., area, process, and/or effluent rad monitors, etc.).

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.
Due to the limited number of safety systems in operation during cold shutdown, refueling, and defueled modes, no IC is indicated during these modes of operation.

This UE will be escalated to an Alert if a transient is in progress during the loss of annunciation or indication.

PINGP Basis Reference(s):

1. USAR Section 7.8.1
2. USAR Figure 7.8-1

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Fuel Clad Degradation.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Levels: (SU4.1 or SU4.2)

SU4.1. Radiation Monitor 1(2)R-9 GREATER THAN 2.4 R/hr indicating fuel clad degradation

SU4.2. Coolant sample activity GREATER THAN Technical Specification 3.4.17 allowable limits indicating fuel clad degradation.

Basis:

This IC is included as a UE because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems.

SU4.1 addresses the RCS Letdown Line Area Monitor that provides indication of fuel clad integrity [Ref. 2]. This EAL threshold is based on a valid RCS Letdown Line [1(2) R-9] alarm or portable radiation monitoring equipment indicating RCS activity is at or about the Technical Specification allowable limit.

SU4.2 addresses coolant samples exceeding coolant Technical Specifications [Ref. 1]. Escalation of this IC to the Alert level is via the Fission Product Barrier Degradation Monitoring ICs.

Although the Technical Specification is applicable for Power Operation, Startup and Hot Standby modes (when average reactor coolant temperature is GREATER THAN 500°F), it is appropriate that this EAL be applicable in all of Hot Standby and Hot Shutdown modes, as it indicates a potential degradation in the level of safety of the plant.

PINGP Basis Reference(s):

1. Technical Specifications 3.4.17
2. USAR Section 10.2.3.3.7

SU5

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

RCS Leakage.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Levels: (SU5.1 or SU5.2)

SU5.1. Unidentified or pressure boundary leakage GREATER THAN 10 gpm.

SU5.2. Identified leakage GREATER THAN 25 gpm.

Basis:

This IC is included as a UE because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. The 10 gpm value for the unidentified and pressure boundary leakage was selected as it is observable with normal control room indications. Lesser values must generally be determined through time-consuming surveillance tests (e.g., mass balances).

The EAL for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage. In either case, escalation of this IC to the Alert level is via Fission Product Barrier Degradation ICs.

PINGP Basis Reference(s):

None

SYSTEM MALFUNCTION

SU6

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of All Onsite or Offsite Communications Capabilities.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Levels: (SU6.1 or SU6.2)

SU6.1. Loss of all Table C-1 onsite communications capability affecting the ability to perform routine operations.

Table C-1 Onsite Communications Systems
• Sound Powered Phones • Plant Paging System • Plant Telephone Network • Plant Radio System

SU6.2. Loss of all Table C-2 offsite communications capability.

Table C-2 Offsite Communications Systems
• Plant Telephone Network • Plant Radio System (dedicated offsite channels) • ENS Network

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities. The loss of offsite communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

The availability of one method of ordinary offsite communications is sufficient to inform state and local authorities of plant problems. This EAL is intended to be used only when extraordinary means (e.g., relaying of information from radio transmissions, individuals being sent to offsite locations, etc.) are being utilized to make communications possible.

Table C-1 onsite communications loss encompasses the loss of all means of routine communications (e.g., commercial telephones, sound powered phone systems, page party system (Gaitronics) and radios / walkie talkies).

Table C-2 offsite communications loss encompasses the loss of all means of communications with offsite authorities. This includes the ENS, commercial telephone lines, telecopy transmissions, dedicated offsite radio channels, and dedicated phone systems.

PINGP Basis Reference(s):

1. PINGP Emergency Plan, Section 7.2

SU8

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Inadvertent Criticality.

Operating Mode Applicability:

Hot Standby
Hot Shutdown

Emergency Action Level: (SU8.1)

SU8.1. An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

Basis:

This IC addresses inadvertent criticality events. While the primary concern of this IC is criticality events that occur in Cold Shutdown or Refueling modes (NUREG 1449, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States), the IC is applicable in other modes in which inadvertent criticalities are possible. This IC indicates a potential degradation of the level of safety of the plant, warranting a UE classification. This IC excludes inadvertent criticalities that occur during planned reactivity changes associated with reactor startups (e.g., criticality earlier than estimated). The Cold Shutdown/Refueling IC is CU8.

This condition can be identified using the startup rate monitor. The term "sustained" is used in order to allow exclusion of expected short term positive startup rates from planned control rod movements such as shutdown bank withdrawal. These short term positive startup rates are the result of the increase in neutron population due to subcritical multiplication.

Escalation would be by the Fission Product Barrier Matrix, as appropriate to the operating mode at the time of the event, or by Emergency Director Judgment.

Note: This EAL is SU8 following SU6. SU7 is not used in NEI 99-01 Revision 4 and that convention is carried forward here.

PINGP Basis Reference(s):

None

SYSTEM MALFUNCTION

SA2

Initiating Condition -- ALERT

Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip Was Successful.

Operating Mode Applicability: Power Operation
Startup
Hot Standby

Emergency Action Level:

SA2.1. Indication(s) exist that a Reactor Protection System setpoint was exceeded
AND
RPS automatic trip did <u>not</u> reduce power to LESS THAN 5%
AND
Any of the following operator actions are successful in reducing power to LESS THAN 5%:

Manual Control Board:
- Reactor Trip
- AMSAC/DSS Actuation
- Turbine Trip

Basis:

This condition indicates failure of the automatic protection system to trip the reactor. This condition is more than a potential degradation of a safety system in that a front line automatic protection system did not function in response to a plant transient and thus the plant safety has been compromised, and design limits of the fuel may have been exceeded. An Alert is indicated because conditions exist that lead to potential loss of fuel clad or RCS. Reactor protection system setpoint being exceeded, rather than limiting safety system setpoint being exceeded, is specified here because failure of the automatic protection system is the issue. A manual trip is any set of actions by the reactor operator(s) at the reactor control console which causes control rods to be rapidly inserted into the core and brings the reactor subcritical (e.g., reactor trip button). Failure of manual trip would escalate the event to a Site Area Emergency.

Following a successful reactor trip, reactor power promptly drops to only a few percent of nominal, and then decays away to a level some 8 decades less. Reactor power levels resulting from radioactive fission product decay are never more than a few percent of nominal power and also lower in time. Heat removal safety systems are sized to remove only decay heat and not significant core power. Reactor power levels at or above 5% (in a core that is supposed to be shutdown) are considered an extreme challenge to the Fuel Cladding barrier and warrant a Critical Safety Function Status Tree (CSFST) Subcriticality-Red path priority. The setpoint has been chosen because it is clearly readable on the power range meters. Reactor power levels in the power range are indicated on PR instruments N41, N42, N43, and N44. [Ref. 3]

A reactor trip can result from a turbine trip. Manual trip also includes manual actuation of the AMSAC/DSS logic. Failure of the manual trip would escalate the event to a Site Area Emergency under EAL SS2.1.

Note: This EAL is SA2 following SU8. SA1 is not used in NEI 99-01 Revision 4 and that convention is carried forward here.

PINGP Basis Reference(s):

1. E-0 Reactor Trip or Safety Injection
2. ES-0.1 Reactor Trip Response
3. F-0.1 Subcriticality

SYSTEM MALFUNCTION

SA4

Initiating Condition -- ALERT

UNPLANNED Loss of Most or All Safety System Annunciation or Indication in Control Room With Either (1) a SIGNIFICANT TRANSIENT in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SA4.1. UNPLANNED loss of most or all annunciators or indicators associated with safety systems for GREATER THAN 15 minutes

- Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV, and ERCS Alarms

AND

Either of the following: (a or b)

a. A SIGNIFICANT TRANSIENT is in progress.

OR

b. Compensatory non-alarming indications are unavailable.

Basis:

This IC and its associated EAL are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment during a transient. Recognition of the availability of computer based indication equipment is considered (e.g., SPDS, plant computer, etc.) via the reference to Emergency Response Computer System (ERCS) alarms.

SIGNIFICANT TRANSIENT is an UNPLANNED event involving one or more of the following: (1) Automatic Turbine Runback >25% Reactor Power, (2) Load Rejection >25% Full Load, (3) Reactor Trip, (4) Safety Injection Actuation, or (5) Reactor Power Oscillations >10%.

The focus of the EAL is on annunciators. The plant design also provides redundant safety system and accident monitoring indication powered from separate uninterruptable power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the UE is based on SU2 "Inability to Reach Required Shutdown Within Technical Specification Limits."

The scope of annunciators and indicators for this EAL is all-inclusive, thus it includes those identified and used in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., area, process, and/or effluent rad monitors, etc.).

"Compensatory non-alarming indications" in this context includes computer based information (i.e., ERCS). If both a major portion of the annunciation system and all computer monitoring are unavailable, the Alert is required.

Due to the limited number of safety systems in operation during cold shutdown, refueling and defueled modes, no IC is indicated during these modes of operation.

This Alert will be escalated to a Site Area Emergency if the operating crew cannot monitor the transient in progress.

Note: This EAL is SA4 following SA2. SA3 is not used in NEI 99-01 Revision 4 and that convention is carried forward here.

PINGP Basis Reference(s):

1. USAR Section 7.7.1
2. USAR Section 7.8.1

SA5

Initiating Condition -- ALERT

AC power capability to essential buses reduced to a single power source for greater than 15 minutes such that any additional single failure would result in station blackout.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SA5.1. AC power capability to Safeguards Buses 15(25) and 16(26) reduced to only one of the following sources for GREATER THAN 15 minutes

- CT-11
- CT-12
- 1RY
- 2RY
- Emergency Diesels D1 (D5) and D2 (D6)

AND

Any additional single failure will result in station blackout.

Basis:

This IC and the associated EALs are intended to provide an escalation from IC SU1, "Loss of All Offsite Power To Essential Buses for Greater Than 15 Minutes." The condition indicated by this IC is the degradation of the offsite and onsite power systems such that any additional single failure would result in a station blackout. This condition could occur due to a loss of offsite power with a concurrent failure of one emergency diesel generator (EDG) to supply power to its emergency buses. Another related condition could be the loss of onsite EDGs with only one train of essential buses being fed from offsite power.

PINGP Essential/emergency Buses are "Safeguards" Buses 15(25) and 16(26).

Offsite power sources include any of the following:

CT-11
CT-12
1RY
2RY

EDGs power sources are:

- D1 (D5)
- D2 (D6)

Safeguards Bus 15 (16) can be cross tied to Safeguards Bus 25 (26) as a power supply.
The subsequent loss of the single remaining power source would escalate the event to a Site Area Emergency in accordance with IC SS1, "Loss of All Offsite and Loss of All Onsite AC Power to Essential Buses."

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. USAR Section 8.4.4
5. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

SYSTEM MALFUNCTION

SS1

Initiating Condition -- SITE AREA EMERGENCY

Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Buses.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SS1.1. Loss of all offsite power to Safeguards Buses 15(25) and 16(26)

AND

Failure of all emergency generators to supply power to emergency Buses15(25) and 16(26).

AND

Failure to restore power to at least one emergency Bus within 10 minutes from the time of loss of both offsite and onsite AC power.

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power will cause core uncovering and loss of containment integrity, thus this event can escalate to a General Emergency. This EAL is indicated by the loss of all offsite and onsite AC power to the 4.16KV safeguards (essential) buses. The 10-minute time duration was selected based on the summary for PINGP procedure 1 ECA-0.0 "Loss of All Safeguards AC Power", and associated Station Black Out Coping Study, which concludes that AC power can be supplied to one safeguards bus within 10 minutes to preclude RCS degradation. This 10-minute time duration excludes transient or momentary power loses.

PINGP "Essential" Buses are "Safeguards" Buses 15(25) and 16(26). PINGP emergency diesel generators (EDG) D1 (5) and D2 (6) are the "emergency generators".

No credit is provided for restoration of power to a non-affected unit bus. However, Safeguards Bus 15 (16) can be cross tied to Safeguards Bus 25 (26) as a power supply.

Escalation to General Emergency is via Fission Product Barrier Degradation or IC SG1, "Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power."

Consideration should be given to operable loads necessary to remove decay heat or provide Reactor Vessel makeup capability when evaluating loss of AC power to essential buses. Even though an essential bus may be energized, if necessary loads (i.e., loads that if lost would inhibit decay heat removal capability or Reactor Vessel makeup capability) are not operable on the energized bus then the bus is not considered operable. If this bus was the only energized bus then a Site Area Emergency per SS1 should be declared.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. USAR Section 8.4.4
5. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power

SYSTEM MALFUNCTION

SS2

Initiating Condition -- SITE AREA EMERGENCY

Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Trip Was NOT Successful.

Operating Mode Applicability: Power Operation
Startup

Emergency Action Level:

SS2.1. Indication(s) exist that automatic and manual trip were NOT successful in reducing power to LESS THAN 5%.

Basis:

Automatic and manual trip are not considered successful if action away from the reactor control console was required to trip the reactor.

Under these conditions, the reactor is producing more heat than the maximum decay heat load for which the safety systems are designed. A Site Area Emergency is indicated because conditions exist that lead to imminent loss or potential loss of both fuel clad and RCS. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response. Escalation of this event to a General Emergency would be via Fission Product Barrier Degradation or Emergency Director Judgment ICs.

Automatic or manual reactor trip is considered successful if manual actions taken at the Control Board: Reactor Trip, AMSAC/DSS Actuation, or Turbine Trip (a reactor trip can result from a turbine trip), result in reducing reactor power less than 5%. Reactor power levels in the power range are indicated on PR instruments N41, N42, N43, and N44.

PINGP Basis Reference(s):

1. <u>E-0 Reactor Trip or Safety Injection</u>
2. <u>ES-0.1 Reactor Trip Response</u>

Initiating Condition -- SITE AREA EMERGENCY

Loss of All Vital DC Power.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SS3.1. Loss of all Safeguards DC power based on LESS THAN 112 VDC on 125VDC Panel 11(21) and Panel 12(22) for GREATER THAN 15 minutes.

Basis:

Loss of all DC power compromises ability to monitor and control plant safety functions. Prolonged loss of all DC power will cause core uncovering and loss of containment integrity when there is significant decay heat and sensible heat in the reactor system. Escalation to a General Emergency would occur by Abnormal Rad Levels/Radiological Effluent, Fission Product Barrier Degradation, or Emergency Director Judgment ICs. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

The configurations of the DC Power Supply Systems for both Units are shown in USAR Figures 8.5-1a, -1b, -2a and -2b. Each Unit has two trains, with one battery and one battery charger serving each train. 125 VDC Panels 11 and 12 serve Unit 1 and 125 VDC Panels 21 and 22 serve Unit 2.

Each of the two station batteries per Unit has been sized to carry expected shutdown loads following a plant trip, and a loss of AC battery charging power for a period of 1 hour without battery terminal voltage falling below the minimum required voltage. Depending on which DC bus, the minimum required voltage ranges from approximately 109.5 to 111.5 VDC, based on site specific calculations to assure that the needed load voltage of is available. The LESS THAN 112 VDC value was chosen as a limiting value encompassing the four DC busses and incorporates a minimum margin of .5 VDC. Each of the four battery chargers has been sized to recharge its associated partially discharged battery within 24 hours, while carrying its normal load.

Receipt of Annunciator 47024-1201, 11 DC PANEL UNDERVOLTAGE, or Annunciator 47024-1204, 12 DC PANEL UNDERVOLTAGE, may be indicative of DC bus voltage degradation.

PINGP "Vital" DC power is "Safeguards" DC power.

PINGP Basis Reference(s):

1. USAR Section 8.5

2. USAR Figure 8.5-1A & 8.5-1B
3. USAR Figure 8.5-2A & 8.5-2B
4. Technical Specifications 3.8.9
5. 1C20.9 AOP1 Loss of Unit 1 Train "A" DC
6. 1C20.9 AOP2 Loss of Unit 1 Train "B" DC
7. 2C20.9 AOP1 Loss of Unit 2 Train "A" DC
8. 2C20.9 AOP2 Loss of Unit 2 Train "B" DC
9. Engineering Calculations 91-02-11 Rev 0, 91-02-12 Rev 1, 91-02-21 Rev 0, 91-02-22 Rev 0

SS4

Initiating Condition -- SITE AREA EMERGENCY

Complete Loss of Heat Removal Capability.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SS4.1. Loss of core cooling and heat sink as indicated by conditions that require entry into:

a. Core Cooling - RED path.

AND

b. Heat Sink - RED path.

Basis:

This EAL addresses complete loss of functions, including ultimate heat sink, required for hot shutdown with the reactor at pressure and temperature. Reactivity control is addressed in other EALs. Accordingly, the "Red Path" EOP conditions for Core Cooling and Heat Sink are the EAL criteria for this condition.

Under these conditions, there is an actual major failure of a system intended for protection of the public. Thus, declaration of a Site Area Emergency is warranted. Escalation to General Emergency would be via Abnormal Rad Levels / Radiological Effluent, Emergency Director Judgment, or Fission Product Barrier Degradation ICs.

PINGP Basis Reference(s):

1. F-0.2 Core Cooling
2. F-0.3 Heat Sink

SYSTEM MALFUNCTION

SS6

Initiating Condition -- SITE AREA EMERGENCY

Inability to Monitor a SIGNIFICANT TRANSIENT in Progress.

Operating Mode Applicability: Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SS6.1. Loss of most or all annunciators associated with safety systems

- Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV, and ERCS Alarms

AND

A SIGNIFICANT TRANSIENT in progress.

AND

Compensatory non-alarming indications are unavailable.

AND

Indications needed to monitor the ability to shut down the reactor, maintain the core cooled, maintain the reactor coolant system intact, and maintain containment intact are unavailable.

Basis:

This IC and its associated EAL are intended to recognize the inability of the control room staff to monitor the plant response to a transient. A Site Area Emergency is considered to exist if the control room staff cannot monitor safety functions needed for protection of the public.

SIGNIFICANT TRANSIENT is an UNPLANNED event involving one or more of the following: (1) Automatic Turbine Runback >25% Reactor Power, (2) Load Rejection >25% Full Load, (3) Reactor Trip, (4) Safety Injection Actuation, or (5) Reactor Power Oscillations >10%.

"Compensatory non-alarming indications" in this context includes computer based information (i.e., ERCS). This should include all computer systems available for this use depending on specific plant design and subsequent retrofits.

Indications needed to monitor safety functions necessary for protection of the public include control room indications, computer generated indications and dedicated annunciation capability. The specific indications are those used to monitor the ability to shut down the reactor, maintain the core cooled, to maintain the reactor coolant system intact, and to maintain containment intact.

"Planned" and "UNPLANNED" actions are not differentiated since the loss of instrumentation of this magnitude is of such significance during a transient that the cause of the loss is not an ameliorating factor.

The scope of annunciators considered for determining "most or all" is all-inclusive. Quantification of "Most" is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Supervisor be tasked with making a judgment decision as to whether additional personnel are required to provide increased monitoring of system operation.

However, annunciators for this EAL should be limited to those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., rad monitors, etc.). Escalation to a Site Area classification is not appropriate if annunciators for these functions and indications needed to monitor safety functions remain operational. It is not intended that plant personnel perform a detailed analysis of the indication that has been lost, but consider the availability of these monitoring functions in determining the severity of the condition.

Note: This EAL is SS6 following SS4. SS5 is not used in NEI 99-01 Revision 4 and that convention is carried forward here.

PINGP Basis Reference(s):

1. USAR Section 7.7.1
2. USAR Section 7.8.1

SYSTEM MALFUNCTION

SG1

Initiating Condition -- GENERAL EMERGENCY

Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power to Essential Buses.

Operating Mode Applicability:

Power Operation
Startup
Hot Standby
Hot Shutdown

Emergency Action Level:

SG1.1. Loss of all offsite power to Safeguards Buses 15(25) and 16(26)

AND

Failure of all emergency diesel generators to supply power to Safeguards Buses 15(25) and 16(26)

AND

Either of the following: (a or b)

a. Restoration of at least one Safeguards Bus within 4 hours is not likely

OR

b. Continuing degradation of core cooling based on Fission Product Barrier monitoring as indicated by conditions that require entry into Core Cooling-RED or ORANGE path

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power will lead to loss of fuel clad, RCS, and containment. The 4 hours to restore AC power is based on the site blackout coping analysis performed in conformance with 10 CFR 50.63 and Regulatory Guide 1.155, "Station Blackout,". Appropriate allowance for offsite emergency response including evacuation of surrounding areas should be considered. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response.

This IC is specified to assure that in the unlikely event of a prolonged station blackout, timely recognition of the seriousness of the event occurs and that declaration of a General Emergency occurs as early as is appropriate, based on a reasonable assessment of the event trajectory.

PINGP "Essential" Buses are "Safeguards" Buses 15(25) and 16(26). PINGP emergency diesel generators (EDG) D1 (5) and D2 (6) are the "emergency generators".

No credit is provided for restoration of power to a non-affected unit bus. However, Safeguards Bus 15 (16) can be cross tied to Safeguards Bus 25 (26) as a power supply.

The likelihood of restoring at least one emergency bus should be based on a realistic appraisal of the situation since a delay in an upgrade decision based on only a chance of mitigating the event could result in a loss of valuable time in preparing and implementing public protective actions.
In addition, under these conditions, fission product barrier monitoring capability may be degraded. Although it may be difficult to predict when power can be restored, it is necessary to give the Emergency Director a reasonable idea of how quickly (s)he may need to declare a General Emergency based on two major considerations:

1. Are there any present indications that core cooling is already degraded to the point that Loss or Potential Loss of Fission Product Barriers is imminent? (Refer to Table F-1, Fission Product Barrier EALs, for more information.)

2. If there are no present indications of such core cooling degradation, how likely is it that power can be restored in time to assure that a loss of two barriers with a potential loss of the third barrier can be prevented?

Thus, indication of continuing core cooling degradation must be based on Fission Product Barrier monitoring with particular emphasis on Emergency Director judgment as it relates to imminent Loss or Potential Loss of fission product barriers and degraded ability to monitor fission product barriers.

PINGP Basis Reference(s):

1. USAR Section 8.2
2. USAR Section 8.3
3. USAR Figure 8.2-2
4. USAR Section 8.4.4
5. 1ECA / 2ECA -0.0 Loss of All Safeguards AC Power
6. F-0.2 Core Cooling
7. FR-C.1 Response to Inadequate Core Cooling
8. FR-C.2 Response to Degraded Core Cooling

SYSTEM MALFUNCTION

SG2

Initiating Condition -- GENERAL EMERGENCY

Failure of the Reactor Protection System to Complete an Automatic Trip and Manual Trip was NOT Successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core.

Operating Mode Applicability: Power Operation
Startup

Emergency Action Level:

SG2.1. Indication(s) exist that automatic and manual trip were NOT successful in reducing power to LESS THAN 5%.

AND

Either of the following: (a or b)

a. Core cooling is extremely challenged as indicated by conditions that require entry into Core Cooling - RED path.

OR

b. Heat removal is extremely challenged as indicated by conditions that require entry into Heat Sink - RED path.

Basis:

Automatic and manual trip are not considered successful if action away from the reactor control console is required to trip the reactor.

Under the conditions of this IC and its associated EALs, the efforts to bring the reactor subcritical have been unsuccessful and, as a result, the reactor is producing more heat than the maximum decay heat load for which the safety systems were designed. Although there are capabilities away from the reactor control console, such as emergency boration, driving control rods, locally tripping control rod power supplies, or local turbine trip (which may result in a reactor trip) , the continuing temperature rise indicates that these capabilities are not effective even if outplant actions reduced power to LESS THAN 5%. This situation could be a precursor for a core melt sequence.

The combination of reactor power greater than 5% and either Core Cooling-RED path or Heat Sink-RED path signals the inability to initially remove heat during the early stages of this sequence.

- If CET readings exceed the Core Cooling-RED path thresholds, a condition indicative of a severe challenge to heat removal exists, resulting in core exit superheating and core uncovery. This is defined to be a loss of the Fuel Cladding barrier.

- If auxiliary feedwater flow is insufficient to remove the amount of heat required by design from at least one steam generator, the ultimate heat sink function is under extreme challenge. This condition addresses loss of functions required for hot shutdown with the reactor at pressure and temperature and thus a potential loss of the RCS barrier.

The extreme challenge to the ability to cool the core is intended to mean that the core exit temperatures are at or approaching 1200 degrees F or that the reactor vessel water level is below the top of active fuel. This EAL equates to a Core Cooling RED condition.

Another consideration is the inability to initially remove heat during the early stages of this sequence. If emergency feedwater flow is insufficient to remove the amount of heat required by design from at least one steam generator, an extreme challenge should be considered to exist. This EAL equates to a Heat Sink RED condition.

In the event either of these challenges exist at a time that the reactor has not been brought below the power associated with the safety system design (typically 3 to 5% power) a core melt sequence exists. In this situation, core degradation can occur rapidly. For this reason, the General Emergency declaration is intended to be anticipatory of the fission product barrier matrix declaration to permit maximum offsite intervention time.

Automatic or manual reactor trip is considered successful if actions taken by Manual Control Board Reactor Trip, AMSAC/DSS Actuation, or Turbine Trip (a reactor trip can result from a turbine trip) result in reducing reactor power less than 5%. Reactor power levels in the power range are indicated on PR instruments N41, N42, N43, and N44. Automatic and manual trips are not considered successful if action away from the Control Room is required to trip the reactor.

PINGP Basis Reference(s):

1. E-0 Reactor Trip or Safety Injection
2. ES-0.1 Reactor Trip Response
3. F-0.1 Subriticality
4. F-0.2 Core Cooling
5. F-0.3 Heat Sink

ATTACHMENT 3

JUSTIFICATION MATRICES

GENERIC DIFFERENCES

PINGP Site Specific Information/Differences/Deviations Justification Matrix

1. Generic Difference

EAL Numbering Scheme –

PINGP utilized a numbering scheme, which is different than the NEI 99-01 Rev 4 numbering scheme. PINGP EALS are represented by an alpha-numeric number that uses the EAL Category, Classification Level, IC number and EAL example number. Categories used are: S – System Malfunction, H – Hazards and Other, F – Fission Product Barrier, R – Abnormal Radiation (Radiological), C – Cold Shutdown System Malfunctions and E – ISFSI Events. Using this category system avoided confusion with the classification designator of U – Unusual Event, A – Alert, S – Site Area Emergency, and G – General Emergency. This numbering scheme supports the communication of the EAL and IC to offsite authorities via the EAL number.

NOTE: The Permanently Defueled numbers were not used because these do not apply to PINGP.

99-01 IC	99-01 EAL #	PINGP EAL Number
AU1	1	RU1.1
AU1	2	RU1.2
AU1	3	RU1.3
AU1	4	N/A
AU1	5	N/A
AU2	1	RU2.1
AU2	2	RU2.2
AA1	1	RA1.1
AA1	2	RA1.2
AA1	3	RA1.3
AA1	4	N/A
AA1	5	N/A
AA2	1	RA2.1
AA2	2	RA2.2
AA3	1	RA3.1
AA3	2	RA3.2
AS1	1	RS1.1

99-01 IC	99-01 EAL #	PINGP EAL Number
AS1	2	RS1.2
AS1	3	N/A
AS1	4	RS1.3
AG1	1	RG1.1
AG1	2	RG1.2
AG1	3	N/A
AG1	4	RG1.3
CU1	1	CU1.1
CU1	2	CU1.2
CU2	1	CU2.1
CU2	2	CU2.2
CU3	1	CU3.1
CU4	1	CU4.1
CU4	2	CU4.2
CU5	1	CU5.1
CU5	2	CU5.2
CU6	1	CU6.1
CU6	2	CU6.2
CU7	1	CU7.1
CU8	1	N/A
CU8	2	CU8.1
CA1	1	CA1.1
CA1	2	CA1.2
CA2	1	CA2.1
CA2	2	CA2.2
CA3	1	CA3.1

99-01 IC	99-01 EAL #	PINGP EAL Number
CA4	1	CA4.1
CA4	2	CA4.2
CA4	3	CA4.3
CS1	1	CS1.1
CS1	2	CS1.2
CS2	1	CS2.1
CS2	2	CS2.2
CG1	1	CG1.1
D-AU1	1	N/A
D-AU1	2	N/A
D-AU2	1	N/A
D-SU1	1	N/A
D-SU1	2	N/A
D-HU1	1	N/A
D-HU2	1	N/A
D-HU3	1	N/A
D-HU3	2	N/A
D-HU3	3	N/A
D-HU3	4	N/A
D-HU3	5	N/A
D-HU3	6	N/A
D-HU3	7	N/A
D-HU3	8	N/A
D-AA1	1	N/A
D-AA1	2	N/A
D-AA2	1	N/A
D-AA2	2	N/A

Generic Differences

99-01 IC	99-01 EAL #	PINGP EAL Number
D-HA1	1	N/A
D-HA2	1	N/A
E-HU1	1	EU1.1
E-HU1	2	EU1.2
E-HU1	3	EU1.3
E-HU2	1	EU2.1
FU1		FU1
FA1		FA1
FS1		FS1
FG1		FG1
Fuel Cladding P-Loss - 1		Fuel Cladding P-Loss - 1
Fuel Cladding P-Loss - 2		Fuel Cladding P-Loss - 2
Fuel Cladding P-Loss - 3		Fuel Cladding P-Loss - 3
Fuel Cladding P-Loss - 4		Fuel Cladding P-Loss - 4
Fuel Cladding P-Loss – 5		Fuel Cladding P-Loss – 5
Fuel Cladding P-Loss – 6		Fuel Cladding P-Loss – 6
Fuel Cladding P-Loss - 7		Fuel Cladding P-Loss - 7
Fuel Cladding Loss - 1		Fuel Cladding Loss - 1
Fuel Cladding Loss - 2		Fuel Cladding Loss - 2
Fuel Cladding Loss - 3		Fuel Cladding Loss - 3
Fuel Cladding Loss - 4		Fuel Cladding Loss - 4
Fuel Cladding Loss - 5		Fuel Cladding Loss – 5
Fuel Cladding Loss - 6		Fuel Cladding Loss – 6
Fuel Cladding Loss - 7		Fuel Cladding Loss – 7
RCS P-Loss -1		RCS P-Loss -1
RCS P-Loss -2		RCS P-Loss -2
RCS P-Loss -3		RCS P-Loss -3

Generic Differences

99-01 IC	99-01 EAL #	PINGP EAL Number
RCS P-Loss -4		RCS P-Loss -4
RCS P-Loss –5		RCS P-Loss –5
RCS P-Loss -6		RCS P-Loss -6
RCS Loss - 1		RCS Loss - 1
RCS Loss - 2		RCS Loss - 2
RCS Loss - 3		RCS Loss - 3
RCS Loss - 4		RCS Loss - 4
RCS Loss – 5		RCS Loss – 5
RCS Loss - 6		RCS Loss - 6
Containment P-Loss - 1		Containment P-Loss - 1
Containment P-Loss - 2		Containment P-Loss - 2
Containment P-Loss - 3		Containment P-Loss - 3
Containment P-Loss – 4		Containment P-Loss – 4
Containment P-Loss – 5		Containment P-Loss – 5
Containment P-Loss – 6		Containment P-Loss – 6
Containment P-Loss – 7		Containment P-Loss – 7
Containment P-Loss - 8		Containment P-Loss - 8
Containment Loss - 1		Containment Loss - 1
Containment Loss – 2		Containment Loss – 2
Containment Loss – 3		Containment Loss – 3
Containment Loss – 4		Containment Loss – 4
Containment Loss – 5		Containment Loss – 5
Containment Loss – 6		Containment Loss – 6
Containment Loss - 7		Containment Loss - 7
Containment Loss - 8		Containment Loss - 8
HU1	1	HU1.1
HU1	2	HU1.2

Generic Differences

99-01 IC	99-01 EAL #	PINGP EAL Number
HU1	3	HU1.3
HU1	4	HU1.4
HU1	5	HU1.5
HU1	6	HU1.6
HU1	7	HU1.7
HU2	1	HU2.1
HU3	1	HU3.1
HU3	2	HU3.2
HU4	1	HU4.1
HU4	2	HU4.2
HU5	1	HU5.1
HA1	1	HA1.1
HA1	2	HA1.2
HA1	3	HA1.3
HA1	4	HA1.4
HA1	5	HA1.5
HA1	6	HA1.6
HA2	1	HA2.1
HA3	1	HA3.1
HA3	2	HA3.2
HA4	1	HA4.1
HA4	2	HA4.2
HA5	1	HA5.1
HA6	1	HA6.1
HS1	1	HS1.1
HS1	2	HS1.2
HS2	1	HS2.1

Generic Differences

99-01 IC	99-01 EAL #	PINGP EAL Number
HS3	1	HS3.1
HG1	1	HG1.1
HG2	1	HG2.1
SU1	1	SU1.1
SU2	1	SU2.1
SU3	1	SU3.1
SU4	1	SU4.1
SU4	2	SU4.2
SU5	1	SU5.1
SU5	2	SU5.2
SU6	1	SU6.1
SU6	2	SU6.2
SU8	1	N/A
SU8	2	SU8.1
SA2	1	SA2.1
SA4	1	SA4.1
SA5	1	SA5.1
SS1	1	SS1.1
SS2	1	SS2.1
SS3	1	SS3.1
SS4	1	SS4.1
SS6	1	SS6.1
SG1	1	SG1.1
SG2	1	SG2.1

2. Generic Difference

NEI IC Wording		PINGP IC Wording
NOUE		UE
Site specific	The NEI acronym "NOUE" for "Notification of Unusual Event" has been changed to "UE" for consistency with the commonly understood and used acronym used by Wisconsin nuclear power plants.	
Difference	The NEI acronym "NOUE" for "Notification of Unusual Event" has been changed to "UE" for consistency with the commonly understood and used acronym used by Wisconsin nuclear power plants.	

3. Generic Difference

NEI IC Wording		PINGP IC Wording
one or more		any
Site specific	By standard English language definition, "one or more" is equivalent to "any." The use of the term "any" decreases EAL user reading burden and, thereby, increases the potential for timely and accurate emergency classifications.	
Difference	By standard English language definition, "one or more" is equivalent to "any." The use of the term "any" decreases EAL user reading burden and, thereby, increases the potential for timely and accurate emergency classifications.	

4. Generic Difference

NEI IC Wording		PINGP IC Wording
Unplanned		UNPLANNED
Site specific	The word "UNPLANNED" is indicated in capital letters because it has a specific definition associated with its use.	
Difference	The word "UNPLANNED" is indicated in capital letters because it has a specific definition associated with its use. (Formatting change only)	

5. Generic Difference

NEI IC Wording		PINGP IC Wording
Greater Than or >		GREATER THAN
Site specific	The words "GREATER THAN" is indicated in capital letters to be consistent throughout the PINGP EALs.	
Difference	NEI 99-01 rev. 4 used the words "GREATER THAN" in various formats of upper case text, lower case text, and as a symbol. For PINGP to apply appropriate emphasis and consistency the word GREATER THAN has been used in upper case text throughout. (Formatting change only)	

6. Generic Difference

NEI IC Wording		PINGP IC Wording
Greater Than or Equal to or ≥		GREATER THAN OR EQUAL TO
Site specific	The words "GREATER THAN OR EQUAL TO" is indicated in capital letters to be consistent throughout the PINGP EALs.	
Difference	NEI 99-01 rev. 4 used the words "GREATER THAN OR EQUAL TO" in various formats of upper case text, lower case text, and as a symbol. For PINGP to apply appropriate emphasis and consistency the words GREATER THAN OR EQUAL TO have been used in upper case text throughout. (Formatting change only)	

7. Generic Difference

NEI IC Wording		PINGP IC Wording
Less Than or <		LESS THAN
Site specific	The words "LESS THAN" is indicated in capital letters to be consistent throughout the PINGP EALs.	
Difference	NEI 99-01 rev. 4 used the words "LESS THAN" in various formats of upper case text, lower case text, and as a symbol. For PINGP to apply appropriate emphasis and consistency the words LESS THAN have been used in upper case text throughout. (Formatting change only)	

8. Generic Difference

NEI IC Wording		PINGP IC Wording
"or"		**"OR"**
Site specific	Utilized **"OR"** to ensure clear communication of applicable alternate indication.	
Difference	Utilized **"OR"** to ensure clear communication of applicable alternate indication. (Formatting change only)	

9. Generic Difference

NEI IC Wording		PINGP IC Wording
scram		trip
Site specific	The term "scram" was replaced with "trip" consistent with PWR terminology.	
Difference	The term "scram" was replaced with "trip" consistent with PWR terminology.	

10. Generic Difference

NEI IC Wording		PINGP IC Wording
And		**AND**
Site specific	Utilized "**AND**" to ensure clear communication of applicable cumulative indication.	
Difference	Utilized "**AND**" to ensure clear communication of applicable cumulative indication. (Formatting change only)	

11. Generic Difference

NEI IC Wording		PINGP IC Wording
either		**EITHER**
Site specific	Utilized "**EITHER**" to ensure clear communication of applicable cumulative indication.	
Difference	Utilized "**EITHER**" to ensure clear communication of applicable cumulative indication. (Formatting change only)	

12. Generic Difference

NEI IC Wording		PINGP IC Wording
Not		**NOT**
Site specific	Utilized "**NOT**" to ensure clear communication of applicable cumulative indication.	
Difference	Utilized "**NOT**" to ensure clear communication of applicable cumulative indication. (Formatting change only)	

13. Generic Difference

NEI IC Wording		PINGP IC Wording
Busses or Buses		Buses
Site specific	Utilized "Buses" for NEI Busses or NEI Buses terms to keep consistency throughout document.	
Difference	Utilized "Buses" for NEI Busses or NEI Buses terms to keep consistency throughout document.	

14. Generic Difference

NEI IC Wording		PINGP IC Wording
"Essential" Buses		"Safeguards" Buses
Site specific	Replaced the NEI phrase "Essential" Buses with site-specific terminology "Safeguards" Buses.	
Difference	Replaced the NEI phrase "Essential" Buses with site-specific terminology "Safeguards" Buses. PINGP USAR, Tech Specs and other procedures use the word Safeguards when describing NEI's Essential buses.	

15. Generic Difference

NEI IC Wording		PINGP IC Wording
"... BWR ..."		Deleted BWR related information.
Site specific	Deleted BWR related information.	
Difference	Deleted BWR related information. PINGP is a Westinghouse 2 Loop PWR.	

SECTIONS 1-5

PINGP Site Specific Information/Differences/Deviations Justification Matrix

Sections 1 through 5 of Technical Basis Document -- Differences Justification	
Specific Additions/Deletions	**Justification**
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
3. Changes to the ACRONYMS list made to reflect site-specific ACRONYMS.	3. Needed to add site-specific acronyms which are applicable to PINGP.
4. Deleted "In 1992, the NRC endorsed NUMARC/NESP-007 "Methodology for Development of Emergency Action Levels" as an alternative to NUREG 0654 EAL guidance."	4. This historical fact does not add value to the PINGP site specific Technical Basis Document because PINGP never used this earlier NUMARC EAL scheme.
5. Added the site-specific definition for CIVIL DISTURBANCE: is a group of two or more persons violently protesting station operations or activities at the site.	5. The NEI definition called for site-specific definition.
6. Added the site-specific definition for CONTAINMENT CLOSURE: is defined by EOP 1E-4, Core Cooling Following Loss of RHR Flow, Attachment I, Containment Closure Procedure. all Containment penetrations having one or more isolation valves closed and one door in each airlock penetration closed.	6. The NEI definition called for site-specific definition.
7. Added the site-specific definition for PROTECTED AREA: the area encompassing all controlled areas within the security protected area fence as shown in USAR Figure 1.1-3, Site Plan Prairie Island Security Fence.	7. The NEI definition called for site-specific definition.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviation	None

ABNORMAL RAD / RADIOLOGICAL EFFLUENT

PINGP Site Specific Information/Differences/Deviations Justification Matrix

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
AU1	Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Radiological Effluent Technical Specifications for 60 Minutes or Longer.	RU1	Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Offsite Dose Calculation Manual Specification for 60 Minutes or Longer.
Mode App.	All		All
Difference	Replaced the term "Radiological Effluent Technical Specifications" with "Offsite Dose Calculation Manual Specification". The Radiological Effluent Technical Specifications were removed from PINGP T.S. The PINGP Offsite Dose Calculation Manual (ODCM) provides the site-specific technical specifications for gaseous and liquid releases.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	VALID reading on any effluent monitor that exceeds two times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.	RU1.1	VALID reading on any effluent monitor that exceeds two times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.
Site specific	N/A		
Difference	None		
Deviation	None		

2	VALID reading on one or more of the following radiation monitors that exceeds the reading shown for 60 minutes or longer: (site-specific list)	RU1.2	VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 60 minutes or longer:
Site specific	▪ The site-specific list of radiation monitors are listed in Table R-1. The values shown in Table R-1 represent 2 times the alarm setpoint (the setpoint is less than or equal to the ODCM specification), which is consistent with RU1.1. Only the "UE" column applies to this EAL. ▪ The specific effluent monitor setpoints are changed or managed based on monitor recalibrations and planned plant processes to ensure the final ODCM specification limits are not exceeded. As a result the EAL uses thresholds expressed as 2 times the alarm setpoints.		

Difference	None
Deviation	None

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
3	Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates, with a release duration of 60 minutes or longer, in excess of two times (site-specific technical specifications).	RU1.3	Confirmed sample analysis for gaseous or liquid release indicates concentrations or release rates, with a release duration of 60 minutes or longer, in excess of two times ODCM specification.
Site specific	The site-specific technical specifications are given in the PINGP ODCM (Offsite Dose Calculation Manual).		
Difference	▪ The NEI word "analyses" has been replaced with "analysis." This is to preclude the operator thinking a declaration cannot be made unless there is more than one analysis. The results of the analysis should be used as long as it is VALID which can be determined by multiple analyses or other means of confirmation. ▪ The NEI word "releases" has been replaced by "release" since the singular is grammatically correct.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
4	VALID reading on perimeter radiation monitoring system greater than 0.10 mR/hr above normal background sustained for 60 minutes or longer [for sites having telemetered perimeter monitors].	N/A	N/A
Site specific	N/A		
Difference	Deleted NEI 99-01 example EAL#4 because the PINGP is not equipped with a perimeter radiation monitoring system.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
	VALID indication on automatic real-time dose assessment capability greater	N/A	N/A

5	than (site-specific value) for 60 minutes or longer [for sites having such capacity].		
Site specific	N/A		
Difference	Deleted NEI 99-01 example EAL#5 because the PINGP is not equipped with automatic real-time dose assessment capability.		
Deviation	None		

RU1 – Basis Justification	
Specific Additions/Deletions	**Justification**
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
3. Changes were made to reflect that PINGP removed the RETS from the site's Technical Specifications. RETS resides in the ODCM.	3. PINGP removed RETS from site's T.S.
4. Added "RU1.1 is intended for effluent monitoring on routine release pathways for which a discharge permit is normally prepared."	4. Adding this sentence helps the reader understand that RU1.2 is intended for situation where discharge permit is not prepared and RU1.1 is intended for situations where discharge permits is prepared. This helps describe the difference between RU1.1 & RU1.2.
5. Replaced the word "insures" with "ensures" in the RU1.1 paragraph.	5. Corrected the NEI spelling of "ensures".
6. Added in RU1.2 discussion the reason why the EAL uses the "alarm setpoints" and not the actual setpoint numbers associated with the alarm.	6. Information was added to explain basis for EAL threshold.
7. Deleted all information related to EAL examples #4 & #5.	7. Those systems do not exist at PINGP.

Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviation	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
AU2	Unexpected Increase in Plant Radiation	RU2	Unexpected Increase in Plant Radiation
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	a. VALID (site-specific) indication of uncontrolled water level decrease in the reactor refueling cavity, spent fuel pool, or fuel transfer canal with all irradiated fuel assemblies remaining covered by water. AND b. Unplanned VALID (site-specific) Direct Area Radiation Monitor reading increases.	RU2.1	VALID indication of uncontrolled water level decrease in the reactor refueling cavity, spent fuel pool, or fuel transfer canal with all irradiated fuel assemblies remaining covered by water as indicated by level LESS THAN SFP low water level alarm, Refueling Canal Level, or visual observation (752.5 feet elevation). AND Any UNPLANNED VALID Area Radiation Monitor reading increases as indicated by: ▪ R-5 Fuel Handling Area Monitor reading ▪ R-28 New Fuel Pool Criticality Area Monitor ▪ 1(2) R-2 Containment Vessel Area Monitor ▪ Other Portable Area Radiation Monitoring Instrumentation.
Site specific	• Site-specific indications "LESS THAN SFP low water level alarm, Refueling Canal Level, or visual observation (752.5 feet elevation)" were added to the EAL. • "Visual observation" was included to address the site-specific indication listed in the NEI 99-01 Rev. 4 basis. • R-28 New Fuel Pool Criticality Area Monitor and R-5 Fuel Handling Area Monitor reading are the site-specific SFP area monitors used to classify the event. The Containment Vessel Area Monitor, 1(2) R-2, are the site-specific Unit 1 and Unit 2 refueling cavity monitors. • Portable monitors are used in the spent fuel pool area and in containment during fuel handling operations.		

Difference	• The NEI term "Direct" has been deleted because the monitors used at PINGP to assess this threshold are commonly referred to as Area Radiation Monitors or ARMs and not DARMs. In addition, the plant EAL specifically names the monitors applicable to this EAL. • The word "UNPLANNED" is indicated in capital letters because it has a specific definition in NEI 99-01 Rev.4. • The word "Any" was added to communicate that an increase in "any one or more" of the listed radiation monitors was an indication for this EAL.
Deviation	None

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Unplanned VALID Direct Area Radiation Monitor readings increases by a factor of 1000 over normal* levels. *Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value.	RU2.2	Any UNPLANNED VALID Area Radiation Monitor reading increases by a factor of 1000 over normal* levels. *Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value. .
Site specific	N/A		
Difference	▪ The NEI term "Direct" has been deleted because the monitors used at PINGP to assess this threshold are commonly referred to as Area Radiation Monitors or ARMs and not DARMs. In addition, the plant EAL specifically names the monitors applicable to this EAL. ▪ The word "UNPLANNED" is indicated in capital letters because it has a specific definition in NEI 99-01 Rev. 4 and used in the basis. ▪ The word "Any" was added to communicate that an increase in "any one or more" area radiation monitor readings in the plant needs to be considered for this EAL.		
Deviation	None		

RU2 – Basis Justification		
Specific Additions/Deletions		Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.		1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.		2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
3. Changes were made to indicate there is sufficient level instrumentation such that, the declaration threshold does not need to be based on indications of water makeup rate or decrease in refueling water storage tank level.		3. PINGP has pool level indication.
4. Added a discussion describing the Spent Fuel Pool (SFP) low level alarm.		4. Added site-specific information to support the EAL threshold.
5. Added a discussion describing the related area radiation monitors.		5. Added site-specific information to support the EAL threshold.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
AA1	Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Radiological Effluent Technical Specifications for 15 Minutes or Longer.	RA1	Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Offsite Dose Calculation Manual Specifications for 15 Minutes or Longer.
Mode App.	All		All
Difference	Replaced the term "Radiological Effluent Technical Specifications" with "Offsite Dose Calculation Manual Specification". The Radiological Effluent Technical Specifications were removed from PINGP T.S. The PINGP Offsite Dose Calculation Manual (ODCM) provides the site-specific technical specifications for gaseous and liquid releases.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	VALID reading on any effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer.	RA1.1	VALID reading on any effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer.
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	VALID reading on one or more of the following radiation monitors that exceeds the reading shown for 15 minutes or longer: (site-specific list)	RA1.2	VALID reading on one or more of the following radiation monitors (Table R-1) that exceeds the reading shown for 15 minutes or longer:
Site specific	▪ The site-specific list of radiation monitors are listed in Table R-1. The values shown in Table R-1 represent 200 times the alarm setpoint (the setpoint is less than or equal to the ODCM specification), which is consistent with RA1.1. Only the "Alert" column applies to this EAL.		

	▪ The specific effluent monitor setpoints are changed or managed based on monitor recalibrations and planned plant processes to ensure the final ODCM specification limits are not exceeded. As a result the EAL uses thresholds expressed as 200 times the alarm setpoints.
Difference	None
Deviation	None

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
3	Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates, with a release duration of 15 minutes or longer, in excess of 200 times (site-specific technical specifications)	RA1.3	Confirmed sample analysis for gaseous or liquid release indicates concentrations or release rates, with a release duration of 15 minutes or longer, in excess of 200 times ODCM specification.
Site specific	The site-specific technical specifications are given in the PINGP ODCM (Offsite Dose Calculation Manual).		
Difference	▪ The NEI word "analyses" has been replaced with "analysis." This is to preclude the operator thinking a declaration cannot be made unless there is more than one analysis. The results of the analysis should be used as long as it is VALID which can be determined by multiple analyses or other means of confirmation. ▪ The NEI word "releases" has been replaced by "release" since the singular is grammatically correct.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
4	VALID reading on perimeter radiation monitoring system greater than 10.0 mR/hr above normal background sustained for 15 minutes or longer [for sites having telemetered perimeter monitors]	N/A	N/A
Site specific	N/A		
Difference	Deleted NEI 99-01 example EAL#4 because the PINGP is not equipped with perimeter radiation monitoring system.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
5	VALID indication on automatic real-time dose assessment capability greater than (site-specific value) for 15 minutes or longer [for sites having such capability]	N/A	N/A
Site specific	N/A		
Difference	Deleted NEI 99-01 example EAL#5 because the PINGP is not equipped with automatic real-time dose assessment capability.		
Deviation	None		

RA1 – Basis Justification	
Specific Additions/Deletions	Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
3. Changes were made to reflect that PINGP removed the RETS from the site's Technical Specifications. RETS resides in the ODCM.	3. PINGP removed RETS from site's T.S.
4. Added "RA1.1 is intended for effluent monitoring on routine release pathways for which a discharge permit is normally prepared."	4. Adding this sentence helps the reader understand that RA1.2 is intended for situation where discharge permit is not prepared and RA1.1 is intended for situations where discharge permits is prepared. This helps describe the difference between RA1.1 & RA1.2.
5. The 15-minute duration criterion, from the EAL, was added to the basis.	5. To match the basis discussion with the NEI EAL statement.
6. Added in RA1.2 discussion the reason why the EAL uses the "alarm setpoints" and not the actual setpoint numbers associated with the alarm.	6. Information was added to explain basis for EAL threshold.
7. Deleted all information related to EAL examples #4 & #5.	7. Those systems do not exist at PINGP.

Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
AA2	Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.	RA2	Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	A VALID (site-specific) alarm or reading on one or more of the following radiation monitors: (site-specific monitors) Refuel Floor Area Radiation Monitor Fuel Handling Building Ventilation Monitor Refueling Bridge Area Radiation Monitor	RA2.1	A VALID alarm or reading on one or more of the following radiation monitors: • R-25 or R-31 SFP Air Monitor • R-5 Fuel Handling Area Monitor reading (10 mR/hr) • R-28 New Fuel Pool Criticality Area Monitor (10 mR/hr) • 1(2) R-11 Ctmt/SBV Air Particulate Monitor • 1(2) R-12 Ctmt/SBV Radio Gas Monitor • 1(2) R-2 Containment Vessel Area Monitor (50 mR/hr)
Site specific	The site-specific list of radiation monitors are listed in the EAL which represent the site-specific equivalents of Refuel Floor Area Radiation Monitor, Fuel Handling Building Ventilation Monitor and Refueling Bridge Area Radiation Monitor.		
Difference	Containment Air Particulate, Radio Gas and Containment Vessel Area monitors were added to include monitoring during the movement of fuel outside the reactor vessel and in Containment. This meets the full intent of the IC.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Water level less than (site-specific) feet for the reactor refueling cavity, spent fuel pool and fuel transfer canal that will result in irradiated fuel uncovering.	RA2.2	Report of visual observation of irradiated fuel uncovered **OR** Loss of water inventory as indicated by inadequate makeup rate that will result in irradiated fuel uncovering.
Site specific	The site-specific reactor refueling cavity level indication cannot be given because there is no level indicating system in the Spent Fuel Pool, refueling cavity or fuel transfer canal. Therefore, visual observation of loss of water level or other indications of loss of water inventory are given in this EAL as suggested in the NEI basis. Water inventory makeup rate and Refueling Water Storage Tank level provide indirect indications of possible inventory losses that could threaten uncovery of irradiate fuel outside the Reactor Vessel.		
Difference	The NEI phrase "Water level less than (site-specific) feet..." has been replaced with "Report of visual observation of irradiated fuel uncovered..." Irradiated fuel is normally seated in storage racks in the spent fuel pool when not located in the Reactor Vessel. The fuel transfer canal is normally in direct communication with the spent fuel pool so that a drop in level in the fuel transfer canal likewise occurs in the spent fuel pool. There is no remote indication of spent fuel pool or fuel transfer canal water level below the spent fuel pool low water level alarm setpoint (which is significantly higher than the top of fuel seated in the spent fuel pool). Report of visual observation of irradiated fuel uncovery in these volumes is, therefore, the only direct method of ascertaining the loss of inventory with respect to fuel uncovery. NEI allows for "personnel (e.g., refueling crew) reports as an alternated to instrumentation. NEI also states: "Depending on available level indication, the declaration threshold may need to be based on indications of water makeup rate or decrease in refueling water storage tank level." PINGP is using water makeup rate as an alternate indicator of this EAL. This change is considered a difference and not a deviation since it appears to be allowed in the NEI basis and PINGP uses alternate thresholds.		
Deviation	None		

RA2 – Basis Justification	
Specific Additions/Deletions	**Justification**
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.

3. Changes were made to RA2.2 basis to describe there is no level indicating system in the Spent Fuel Pool, refueling cavity or fuel transfer canal that could be used in indicate these low EAL related water levels. Visual observation of loss of water level would be required or indications of water makeup capabilities.		3. PINGP does not have level indicating system in the Spent Fuel Pool, refueling cavity or fuel transfer canal that could be used in indicate these low EAL related water levels.
Difference	▪ All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds. ▪ The change described in #3 above is a difference. Water level indication was not used in the EAL and Basis since PINGP does not have pool level indication at these low levels. The NEI basis provided a list of alternate indicators that may be used for those plants that do not have instrumentation. NEI basis read that water makeup capabilities may have to be used if level indication was not available.	
Deviation	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
AA3	Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown.	RA3	Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	VALID (site-specific) radiation monitor readings GREATER THAN 15 mR/hr in areas requiring continuous occupancy to maintain plant safety functions: (Site-specific) list	RA3.1	VALID radiation monitor readings GREATER THAN 15 mR/hr in areas requiring continuous occupancy to maintain plant safety functions: Control Room (Rad monitor R-1) **OR** Central Alarm Station (by portable radiation monitoring instrumentation)
Site specific	The site-specific list of continuous occupancy is listed as Control Room and Central Alarm Station. Rad monitor R-1 is the site-specific Control Room monitor. CAS does not have an installed rad monitor, therefore, the dose rate will be determined by portable radiation monitoring instrumentation.		
Difference	The site-specific radiation monitor list is given with the site-specific plant area list. This improves the readability of this EAL.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	VALID (site-specific) radiation monitor readings GREATER THAN <site-specific> values in areas requiring infrequent access to maintain plant safety functions. (Site-specific) list	RA3.2	Any VALID radiation monitor reading GREATER THAN 12 R/hr in areas requiring infrequent access to maintain plant safety functions (Table H-1).
Site specific	▪ A site-specific value of 12 R/hr is used which matches the administrative limit for access to these areas using a stay time of 15 minutes for the required activity. ▪ The basis of the 12 R/hr value is as follows: The PINGP annual administrative personnel exposure limit is 2 Rem/Year. 40% of the 10CFR 20 dose (2 Rem/yr) can be received by PINGP radiation workers without supervisor approval. Assuming an emergency worker is at his administrative limit, any emergency worker needing access to a plant area for the safe shutdown of the plant could receive up to an additional 3 Rem without exceeding the legal 10CFR20 annual exposure limit of 5 Rem and thus the need for emergency exposure authorization. Assuming that an activity required to be performed in the plant would, on average, require a 15 minute stay time in that area, an area exposure rate of 12 R/hr would not unduly impede access to areas necessary for safe plant shutdown. ▪ The site-specific list of infrequently accessed areas in the plant are provided in "Table H-1 Plant Areas". The areas correlated to RA3.2 are those areas requiring infrequent access in order to maintain plant safety functions.		
Difference	▪ "Any" has been added to clarify the fact that the threshold is met if there is a rise one or more of the indicated readings. ▪ "values" was deleted from the EAL sentence as it was substituted with one site-specific value of 12 R/hr.		
Deviation	None		

RA3 – Basis Justification	
Specific Additions/Deletions	**Justification**
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.

3. The sentence "At multiple-unit sites, the example EALs could result in declaration of an Alert at one unit due to a radioactivity release or radiation shine resulting from a major accident at the other unit. This is appropriate if the increase impairs operations at the operating unit." Was deleted.	3. Consistent with NEI guidance on "Treatment Of Multiple Events": "The emergency class is based on the highest EAL reached. For example, two Alerts remain in the Alert category. Or, an Alert and a Site Area Emergency is a Site Area Emergency." In other words, if a major accident on Unit 1 causes radioactive shine on Unit 2 that meets the Alert threshold, the site stays at the Site Area Emergency or General Emergency. PINGP declares the highest classification when two events are occurring one at each unit. PINGP does not make multiple declarations if a new EAL conditions are met at the other unit. The reason for this is to keep focus on the highest classification, which presents the highest threat to public safety. Offsite agencies and NRC are notified of conditions for each unit throughout a declared emergency. A declared emergency relates to the site whether it is because of accident condition at one unit or both units. This is consistent with NEI guidance provided in the introductory section.
4. RA3.2 basis describes the basis for the site-specific threshold.	4. It was felt necessary to include the calculation basis for using the site-specific EAL threshold.

Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviation	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
AS1	Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mR TEDE or 500 mR Thyroid CDE for the Actual or Projected Duration of the Release.	RS1	Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mRem TEDE or 500 mRem Thyroid CDE for the Actual or Projected Duration of the Release.
Mode App.	All		All
Difference	"mRem" was used instead of "mR" to reflect the correct dose terminology used for radiation dose to humans. The NRC's Emergency Technical Resource Manual also uses mRem when discussing dose to the public.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	NOTE: If dose assessment results are available at the time of declaration, the classification should be based on EAL #2 instead of EAL #1. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated. VALID reading on one or more of the following radiation monitors that exceeds or is expected to exceed the reading shown for 15 minutes or longer: (site-specific list)	RS1.1	NOTE: If dose assessment results are available at the time of declaration, the classification should be based on RS1.2 instead of RS1.1. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated. VALID reading on one or more monitors listed in Table R-1 that exceeds or is expected to exceed column "SAE" for 15 minutes or longer.
Site specific	The site-specific list of radiation monitors are listed in Table R-1. The "SAE" column applies to this EAL only. The value shown for 1(2) R-50 High Range Stack Gas Monitor represents a monitor reading that will result in a dose of exceeding approximately 100 mRem TEDE or 500 mRem Thyroid CDE assuming a one hour duration release.		
Difference	The phrase "of the following radiation monitors" in the NEI EAL was replaced by "monitors listed in Table R-1" and later in the sentence "column "SAE" for the purpose of using a commonly used table that applies to several EALs.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Dose assessment using actual meteorology indicates doses greater than 100 mR TEDE or 500 mR thyroid CDE at or beyond the site boundary.	RS1.2	Dose assessment using actual meteorology indicates doses GREATER THAN 100 mRem TEDE or 500 mRem thyroid CDE at or beyond the site boundary.
Site specific	N/A		
Difference	▪ "mRem" was used instead of "mR" to reflect the correct dose terminology used for radiation dose to humans. The NRC's Emergency Technical Resource Manual also uses mRem when discussing dose to the public. ▪ "GREATER THAN" replaced "greater than" to maintain consistency in the use of capitalized mathematical relationships.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
3	A VALID reading sustained for 15 minutes or longer on perimeter radiation monitoring system greater than 100 mR/hr. [for sites having telemetered perimeter monitors]	N/A	N/A
Site specific	N/A		
Difference	Deleted NEI 99-01 Example EAL #3 because the PINGP is not equipped with perimeter radiation monitoring.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
4	Field survey results indicate closed window dose rates exceeding 100 mR/hr expected to continue for more than one hour; or analyses of field survey samples indicate thyroid CDE of 500 mR for one hour of inhalation, at or beyond the site boundary	RS1.3	Field survey results indicate closed window dose rates exceeding 100 mR/hr expected to continue for more than one hour, at or beyond the site boundary; **OR** Analyses of field survey samples indicate thyroid CDE of 500 mRem for one hour of inhalation, at or beyond the site boundary.

Site specific	N/A
Difference	▪ "mRem" was used instead of "mR" to reflect the correct dose terminology used for radiation dose to humans. The NRC's Emergency Technical Resource Manual also uses mRem when discussing dose to the public. The closed window units are kept as mR/hr since this is a radiation reading from a meter and not a dose rate to the public. ▪ Utilized "OR" to ensure clear communication of applicable alternate indication. This caused for the need to specify "at or beyond the site boundary" at the end of the first EAL condition.
Deviation	None

RS1 – Basis Justification	
Specific Additions/Deletions	**Justification**
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
3. The NEI statement "However, some states have decided to calculate child thyroid CDE. Utility IC/EALs need to be consistent with those of the states involved in the facility's emergency planning zone" was deleted.	3. MN and WI both use thyroid committed dose equivalent (CDE) and NOT child thyroid CDE.
4. The NEI basis discussion for Dose Projection Calculations used in RS1.1 was deleted.	4. The basis for the radiation monitor thresholds are discussed in Reference 4 and not in the basis.
5. The NEI statement "Contrary to the practices specified in revision 2 of this document, classification should not be delayed pending the results of these dose assessments" was deleted.	5. The readers of this basis are not familiar with revision 2 of NEI 99-01. Therefore, the reader has never heard anything else but the PINGP practice of "classification should not be delayed pending the results of dose assessments". Therefore, this statement is not needed and may be confusing if left in the basis.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviation	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
AG1	Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mR TEDE or 5000 mR Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.	RG1	Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mRem TEDE or 5000 mRem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.
Mode App.	All	All	
Difference	"mRem" was used instead of "mR" to reflect the correct dose terminology used for radiation dose to humans. The NRC's Emergency Technical Resource Manual also uses mRem when discussing dose to the public.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	NOTE: If dose assessment results are available at the time of declaration, the classification should be based on EAL #2 instead of EAL #1. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated. VALID reading on one or more of the following radiation monitors that exceeds or is expected to exceed the reading shown for 15 minutes or longer: (site-specific list)	RG1.1	NOTE: If dose assessment results are available at the time of declaration, the classification should be based on RG1.2 instead of RG1.1. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated. VALID reading on one or more monitors listed in Table R-1 that exceeds or is expected to exceed column "GE" for 15 minutes or longer.
Site specific	The site-specific list of radiation monitors are listed in Table R-1. The "GE" column applies to this EAL only. The value shown for 1(2) R-50 High Range Stack Gas Monitor represents a monitor reading that will result in a dose of exceeding approximately 1000 mRem TEDE or 5000 mRem Thyroid CDE assuming a one hour duration release.		
Difference	The phrase "of the following radiation monitors" in the NEI EAL was replaced by "monitors listed in Table R-1" and later in the sentence "column "GE" for the purpose of using a commonly used table that applies to several EALs.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Dose assessment using actual meteorology indicates doses greater than 1000 mR TEDE or 5000 mR thyroid CDE at or beyond the site boundary.	RG1.2	Dose assessment using actual meteorology indicates doses GREATER THAN 1000 mRem TEDE or 5000 mRem thyroid CDE at or beyond the site boundary.
Site specific	N/A		
Difference	▪ "mRem" was used instead of "mR" to reflect the correct dose terminology used for radiation dose to humans. The NRC's Emergency Technical Resource Manual also uses mRem when discussing dose to the public. ▪ "GREATER THAN" replaced "greater than" to maintain consistency in the use of capitalized mathematical relationships.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
3	A VALID reading sustained for 15 minutes or longer on perimeter radiation monitoring system greater than 1000 mR/hr. [for sites having telemetered perimeter monitors]	N/A	N/A
Site specific	N/A		
Difference	Deleted NEI 99-01 Example EAL #3 because the PINGP plant is not equipped with perimeter radiation monitoring.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
4	Field survey results indicate closed window dose rates exceeding 1000 mR/hr expected to continue for more than one hour; or analyses of field survey samples indicate thyroid CDE of 5000 mR for one hour of inhalation, at or beyond site boundary.	RG1.3	Field survey results indicate closed window dose rates exceeding 1000 mR/hr expected to continue for more than one hour, at or beyond site boundary. **OR** Analyses of field survey samples indicate thyroid CDE of 5000 mRem for one hour of inhalation, at or beyond site boundary.
Site	N/A		

specific	
Difference	▪ "mRem" was used instead of "mR" to reflect the correct dose terminology used for radiation dose to humans. The NRC's Emergency Technical Resource Manual also uses mRem when discussing dose to the public. The closed window units are kept as mR/hr since this is a radiation reading from a meter and not a dose rate to the public. ▪ Utilized "OR" to ensure clear communication of applicable alternate indication. This caused for the need to specify "at or beyond the site boundary" at the end of the first EAL condition.
Deviation	None

RG1 – Basis Justification	
Specific Additions/Deletions	Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
3. The NEI statement "However, some states have decided to calculate child thyroid CDE. Utility IC/EALs need to be consistent with those of the states involved in the facility's emergency planning zone" was deleted.	3. MN and WI both use thyroid committed dose equivalent (CDE) and NOT child thyroid CDE.
4. The NEI basis discussion for Dose Projection Calculations used in RG1.1 was deleted.	4. The basis for the radiation monitor thresholds are discussed in Reference 4 and not in the basis.
5. The NEI statement "Contrary to the practices specified in revision 2 of this document, classification should not be delayed pending the results of these dose assessments" was deleted.	5. The readers of this basis is not familiar with revision 2 of NEI 99-01. Therefore, the reader has never heard anything else but the PINGP practice of "classification should not be delayed pending the results of dose assessments". Therefore, this statement is not needed and may be confusing if left in the basis.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviation	None

COLD SHUTDOWN / REFUELING SYSTEM MALFUNCITON

PINGP Site Specific
Information/Differences/Deviations
Justification Matrix

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CU1	RCS Leakage	CU1	RCS Leakage
Mode App.	Cold Shutdown		Cold Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Unidentified or pressure boundary leakage greater than 10 gpm	CU1.1	Unidentified or pressure boundary leakage GREATER THAN 10 gpm
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Identified leakage greater than 25 gpm	CU1.2	Identified leakage GREATER THAN 25 gpm
Site specific	N/A		
Difference	None		
Deviation	None		

CU1 – Basis Justification		
PINGP Specific Additions/Deletions		**Justification**
None		N/A
Difference	None	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CU2	UNPLANNED Loss of RCS Inventory with Irradiated Fuel in the RPV	CU2	UNPLANNED loss of RCS inventory with irradiated fuel in the RPV
Mode App.	Refueling		Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	UNPLANNED RCS level decrease below the RPV flange for ≥ 15 minutes	CU2.1	UNPLANNED RCS level decrease below the RPV flange for GREATER THAN OR EQUAL TO 15 minutes
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	a. Loss of RPV inventory as indicated by unexplained {site-specific} sump and tank level increase **AND** b. RPV level cannot be monitored	CU2.2	Loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms **AND** RPV level cannot be monitored
Site specific	"level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms" are the site specific indications which can be used to detect loss of reactor vessel level inventory.		
Difference	None		
Deviation	None		

CU2 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Added site-specific information on sumps, tanks and reactor vessel level indication to the basis where appropriate.	The site-specific information is required for EAL determination.

Difference	Added site-specific information to the basis. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CU3	Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes	CU3	Loss of All Offsite Power to Essential Busses for GREATER THAN 15 Minutes
Mode App.	Cold Shutdown, Refueling		Cold Shutdown, Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	a. Loss of power to (site-specific) transformers for greater than 15 minutes. AND b. At least (site-specific) emergency generators are supplying power to emergency busses	CU3.1	Loss of all offsite power to Buses 15(25) and 16(26) for GREATER THAN 15 minutes. AND At least one emergency generator is supplying power to an emergency bus.
Site specific	▪ "all offsite power to Buses 15(25) and 16(26)" has been used in place of "transformers" to focus the classification on the loss of offsite power capability rather than the status of one or more transformers that may or may not be capable of powering the essential buses ▪ Buses 15(25) and 16(26) identifies the site specific buses ▪ "one diesel generator" is the site specific number needed to power one bus.		
Difference	"all offsite power to Buses 15(25) and 16(26)" has been used in place of "transformers" to focus the classification on the loss of offsite power capability rather than the status of one or more transformers that may or may not be capable of powering the essential buses. This simplifies the EAL wording for user classification, and meets the intent of the NEI IC by bringing information that is more specific to classification from the Basis directly to the EAL. The second sentence was reworded to clarify that at least emergency bus is required to be energized and to further clarify that one emergency generator is required to be energizing an emergency bus. The NEI wording did not make these requirements clear. These changes improve the usability of the EAL without changing the threshold or intent. Therefore, this is not a deviation.		
Deviation	None		

CU3 – Basis Justification		
PINGP Specific Additions/Deletions		**Justification**
Description of the PINGP 4160VAC safeguards power configuration was included into the EAL basis, including ability to crosstie affected/non-affected Unit buses.		This information is necessary to clarify the conditions under which this EAL would apply.
Difference	Added site-specific information on offsite power sources. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CU4	UNPLANNED Loss of Decay Heat Removal Capability with Irradiated Fuel in the RPV	CU4	UNPLANNED Loss of Decay Heat Removal Capability with Irradiated Fuel in the RPV
Mode App.	Cold Shutdown, Refueling		Cold Shutdown, Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	An UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit	CU4.1	An UNPLANNED event results in RCS temperature exceeding 200°F
Site specific	"200 °F" is the Technical Specification cold shutdown temperature limit for PINGP.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Loss of all RCS temperature and RPV level indication for > 15 minutes	CU4.2	Loss of all RCS temperature and RPV level indication for GREATER THAN 15 minutes.
Site specific	N/A		
Difference	None		
Deviation	None		

CU4 – Basis Justification		
PINGP Specific Additions/Deletions		Justification
1. Revised sentence discussing escalation to Alert.		1. The 30-minute time statement was incorrect for CA4 escalation; CA4 is now simply referenced, without describing the specific EAL conditions.
2. Added site specific information: • Describing instrumentation on which Reactor Vessel water level is normally monitored. • Added site-specific minimum time prior to entering Refueling mode		2. This information was added to clarify indications available to persons making decisions on this EAL classification.
Difference	Revised escalation sentence. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None.	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CU5	Fuel Clad Degradation	CU5	Fuel Clad Degradation
Mode App.	Cold Shutdown, Refueling		Cold Shutdown, Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	(Site-specific) radiation monitor readings indicating fuel clad degradation greater than Technical Specification allowable limits	CU5.1	RCS Letdown Rad Monitor 1(2)R-9 or portable radiation monitoring instrumentation GREATER THAN 2.4 R/hr indicating fuel clad degradation
Site specific	2.4 R/hr on RCS Letdown Rad Monitor 1(2)R-9, or equivalent portable monitoring, correlates to fuel damage from RCS activity being at Technical Specification limits.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	(Site-specific) coolant sample activity value indicating fuel clad degradation greater than Technical Specification allowable limits	CU5.2	Coolant sample activity GREATER THAN Technical Specification 3.4.17 allowable limits indicating fuel clad degradation
Site specific	Technical Specification 3.4.17 provides PINGP specific limits		
Difference	Technical Specification 3.4.17 provides PINGP specific limits, with re-wording for readability. This change is not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

CU5 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
1. Added site-specific radiation monitor basis for indicating fuel clad degradation greater than Technical Specification allowable limits.	1. This information was added to clarify the use of R-9
2. Added site-specific information Technical Specification limit reference.	2. Refer to the specific TS limit reference

Difference	Added site-specific radiation monitor basis for indicating fuel clad degradation greater than Technical Specification allowable limits, and added site-specific information Technical Specification limits. The changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CU6	UNPLANNED Loss of All Onsite or Offsite Communications Capabilities	CU6	UNPLANNED Loss of All Onsite or Offsite Communications Capabilities
Mode App.	Cold Shutdown, Refueling		Cold Shutdown, Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of all (site-specific list) onsite communications capability affecting the ability to perform routine operations	CU6.1	Loss of all Table C-1 onsite communications capability affecting the ability to perform routine operations
Site specific	Table C-1 lists site specific equipment used for onsite communications		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Loss of all (site-specific list) offsite communications capability	CU6.2	Loss of all Table C-2 offsite communications capability
Site specific	Table C-2 lists site specific equipment used for offsite communications		
Difference	None		
Deviation	None		

CU6 – Basis Justification		
PINGP Specific Additions/Deletions		**Justification**
Explanation of Tables C1 and C2 was added to the basis.		Tables C1 and C2 were added to clearly delineate between onsite communication equipment and offsite communication equipment.
Difference	Explanation of Tables C1 and C2 were added. The changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CU7	UNPLANNED Loss of Required DC Power for Greater than 15 Minutes	CU7	UNPLANNED loss of required DC power for GREATER THAN 15 minutes
Mode App.	Cold Shutdown, Refueling		Cold Shutdown, Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	a. UNPLANNED Loss of Vital DC power to required DC busses based on (site-specific) bus voltage indications. **AND** b. Failure to restore power to at least one required DC bus within 15 minutes from the time of loss.	CU7.1	UNPLANNED Loss of required vital DC power based on LESS THAN 112 VDC on 125 VDC Panels 11(21) and 12(22) **AND** Failure to restore power to at least one required DC panel within 15 minutes from the time of loss.
Site specific	LESS THAN 112 VDC on Train A and Train B DC Distribution Panels is the PINGP design voltage and specific DC sources of safety-related DC power.		
Difference	The site-specific term "Panel" is used instead of "Bus" and the sentence is reordered. This change is not a deviation because it does not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

CU7 – Basis Justification		
PINGP Specific Additions/Deletions		**Justification**
1. Added site-specific nomenclature for safeguards DC train and DC distribution "panels".		1. This information was added for explanation and clarification of the specific equipment involved when making determinations under this EAL.
2. Provided basis for 112 VDC value		2. Provide context for EAL user on actual voltages where components become nonfunctional
Difference	Added site-specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CU8	Inadvertent Criticality	CU8	Inadvertent Criticality
Mode App.	Cold Shutdown, Refueling		Cold Shutdown, Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	An UNPLANNED extended positive period observed on nuclear instrumentation	N/A	N/A
Site specific	N/A		
Difference	N/A		
Deviation	Not applicable, BWR NEI EAL.		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	An UNPLANNED sustained positive startup rate observed on nuclear instrumentation	CU8.1	An UNPLANNED sustained positive startup rate observed on nuclear instrumentation
Site specific	N/A		
Difference	None		
Deviation	None		

CU8 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Added - 1(2)N-31 and 1(2)N-32, NIS recorder NR-45, audible count rate monitor 1(2)N34A, and the shutdown monitor	This was added to provide site-specific information to the instrumentation used for the EAL.
Difference	Added site specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None.

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CA1	Loss of RCS Inventory	CA1	Loss of RCS Inventory
Mode App.	Cold Shutdown		Cold Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of RCS inventory as indicated by RPV level less than {site-specific level}. (low-low ECCS actuation setpoint) (BWR) (bottom ID of the RCS loop) (PWR)	CA1.1	Loss of RCS inventory as indicated by RPV level at 0 inches Refueling Canal/RCS Narrow Range/Ultrasonic (at or LESS THAN 75% RVLIS Full Range)
Site specific	0 inches Refueling Canal/RCS Narrow Range/Ultrasonic (at or LESS THAN 75% RVLIS Full Range) is the PINPG instrumentation reading for RPV level at the bottom inside diameter of the hot leg penetration. Refer to Figure C1-40.		
Difference	Although retained for RVLIS indication, "less than" was deleted from the EAL for Refueling Canal/RCS Narrow Range/Ultrasonic due to the indication being lost below this point (bottom ID of the hot leg). This is in accordance with the NEI basis for the EAL which states "The Bottom ID of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost". These changes are not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	a. Loss of RCS inventory as indicated by unexplained {site-specific} sump and tank level increase **AND** b. RCS level cannot be monitored for > 15 minutes	CA1.2	Loss of RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms **AND** RCS level cannot be monitored for GREATER THAN 15 minutes
Site specific	"level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms" are the site specific indications which can be used to detect loss of reactor vessel level inventory		

Difference	None
Deviation	None

CA1 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Added site-specific information on Reactor water level monitoring indications, corresponding elevations, and applicable sumps and tanks.	This information was added for explanation and clarification of site specifics.
Difference	Added PINGP site-specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CA2	Loss of RPV Inventory with Irradiated Fuel in the Reactor Vessel	CA2	Loss of RPV Inventory with Irradiated Fuel in the Reactor Vessel
Mode App.	Refueling		Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of RPV inventory as indicated by RPV level less than {site-specific level}.	CA2.1	Loss of RPV inventory as indicated by RPV level at 0 inches Refueling Canal/RCS Narrow Range/Ultrasonic indication
Site specific	0 inches Refueling Canal/RCS Narrow Range/Ultrasonic is the PINPG instrumentation reading for RPV level at the bottom of the hot leg penetration. Refer to Figure C1-40.		
Difference	"less than" was deleted from the EAL due to the indication being lost below this point (bottom ID of the hot leg). This is in accordance with the NEI basis for the EAL which states "The Bottom ID of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost". These changes are not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	a. Loss of RPV inventory as indicated by unexplained {site-specific} sump and tank level increase **AND** b. RPV level cannot be monitored for > 15 minutes	CA2.2	Loss of RCS inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms **AND** RPV level cannot be monitored for GREATER THAN 15 minutes
Site specific	"level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms" are the site specific indications for detecting loss of reactor vessel level inventory		
Difference	None		
Deviation	None		

CA2 – Basis Justification		
PINGP Specific Additions/Deletions		**Justification**
1. Added site-specific information on Reactor water level monitoring indications, corresponding elevations, and applicable sumps and tanks.		1. This information was added for explanation and clarification of site specifics. RVLIS is not available in Refueling Mode, requiring the use of other instrumentation to determine EAL value.
2. Added site-specific minimum time prior to entering Refueling mode		2. Provided PINGP specific time
Difference	Added PINGP site-specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CA3	Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses	CA3	Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses
Mode App.	Cold Shutdown, Refueling, Defueled		Cold Shutdown, Refueling, Defueled
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	a. Loss of power to (site-specific) transformers. AND b. Failure of (site-specific) emergency generators to supply power to emergency busses. AND c. Failure to restore power to at least one emergency bus within 15 minutes from the time of loss of both offsite and onsite AC power.	CA3.1	Loss of all offsite power to Buses 15(25) and 16(26) AND Failure of all emergency generators to supply power to emergency Buses 15(25) and 16(26). AND Failure to restore power to at least one emergency bus within 15 minutes from the time of loss of both offsite and onsite AC power.
Site specific	• "all offsite power to Buses 15(25) and 16(26)" has been used in place of "transformers" to focus the classification on the loss of offsite power capability rather than the status of one or more transformers that may or may not be capable of powering the essential buses. This simplifies the EAL wording for user classification, and meets the intent of the NEI IC by bringing information that is more specific to classification from the Basis directly to the EAL. Therefore, this is not a deviation. • "all" refers to the number of emergency diesel generators. The second sentence was reworded to clarify that there are no emergency generators supplying supplying power to emergency buses. These changes improve the usability of the EAL without changing the threshold or intent.		
Difference	"all offsite power to Buses 15(25) and 16(26)" has been used in place of "transformers" to focus the classification on the loss of offsite power capability rather than the status of one or more transformers that may or may not be capable of powering the essential buses. This simplifies the EAL wording for user classification, and meets the intent of the NEI IC by bringing information that is more specific to classification from the Basis directly to the EAL. As such, this is not a Deviation.		
Deviation	None		

CA3 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
1. Added site-specific information on PINGP offsite and onsite AC power to the 4160 VAC ESF buses.	1. This information was added for explanation and clarification of site specifics.
2. Provided information on availability of cross-tie, consistent with NEI guidance for all other Loss of AC ICs and EALs	2. Ensure the EAL user is aware of potential to take credit for cross-tie

Difference	Added PINGP site-specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None.

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CA4	Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV	CA4	Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the Reactor Vessel
Mode App.	Cold Shutdown, Refueling		Cold Shutdown, Refueling
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	With CONTAINMENT CLOSURE and RCS integrity not established an UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit.	CA4.1	With CONTAINMENT CLOSURE and RCS integrity not established an UNPLANNED event results in RCS temperature exceeding 200 degrees F.
Site specific	200°F - represents the Tech Spec cold shutdown temperature limit (Less than or equal to 200°F).		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	With CONTAINMENT CLOSURE established and RCS integrity not established or RCS inventory reduced an UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit for greater than 20 minutes[1].	CA4.2	With CONTAINMENT CLOSURE established and RCS integrity not established or RCS inventory reduced an UNPLANNED event results in RCS temperature exceeding 200 degrees F for GREATER THAN 20 minutes[1]. [1]Note: If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced then this EAL is not applicable.
Site specific	200°F - represents the Tech Spec cold shutdown temperature limit		
Difference	Inserted note contained in NEI document for human factors consideration. This change is not a deviation because it dose not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
3	An UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit for greater than 60 minutes[1] or results in an RCS pressure increase of greater than {site-specific} psig.	CA4.3	An UNPLANNED event results in RCS temperature exceeding 200 degrees F for GREATER THAN 60 minutes[1] or results in an RCS pressure increase of GREATER THAN 25psig. [1]Note: If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced then this EAL is not applicable.
Site specific	▪ 200°F - represents the Tech Spec cold shutdown temperature ▪ 25 psig		
Difference	None		
Deviation	None		

CA4 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Added PINGP site-specific information on pressure indication and temperature limits.	This information was added for explanation and clarification of site specifics.

Difference	Added PINGP site-specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CS1	Loss of RPV Inventory Affecting Core Decay Heat Removal Capability	CS1	Loss of RPV Inventory Affecting Core Decay Heat Removal Capability
Mode App.	Cold Shutdown		Cold Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	With CONTAINMENT CLOSURE <u>not</u> established: a. RPV inventory as indicated by RPV level less than {site-specific level} (6" below the low-low ECCS actuation setpoint) (BWR) (6" below the bottom ID of the RCS loop) (PWR) **<u>OR</u>** b. RPV level cannot be monitored for > 30 minutes with a loss of RPV inventory as indicated by unexplained {site-specific} sump and tank level increase	CS1.1	With CONTAINMENT CLOSURE <u>not</u> established: a. RPV inventory as indicated by RPV level LESS THAN 73% RVLIS Full Range **OR** b. RPV level cannot be monitored for GREATER THAN 30 minutes with a loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms
Site specific	▪ 73% RVLIS Full Range is PINGP setpoint for 6" below ID of Hot Leg ▪ "level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms" are the site specific indications for potential detection of reactor vessel level inventory		
Difference	None		
Deviation	None.		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	With CONTAINMENT CLOSURE established a. RPV inventory as indicated by RPV level less than TOAF <u>OR</u> b. RPV level cannot be monitored for > 30 minutes with a loss of RPV inventory as indicated by either: • Unexplained {site-specific} sump and tank level increase • Erratic Source Range Monitor Indication	CS1.2	With CONTAINMENT CLOSURE established: a. RPV inventory as indicated by RPV level LESS THAN 63% RVLIS Full Range **OR** b. RPV level cannot be monitored for GREATER THAN 30 minutes with a loss of RPV inventory as indicated by either: • Unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms • Erratic Source Range Monitor Indication
Site specific	▪ 63% RVLIS Full Range is PINGP's setpoint for top of active fuel. ▪ "level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms" are the site specific indications for potential detection of RPV loss of inventory		
Difference	None		
Deviation	None		

CS1 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
1. Added site-specific information on Reactor water level monitoring indications, corresponding elevations, and applicable sumps and tanks.	1. This information was added for explanation and clarification of site specifics. RVLIS is not available in Refueling Mode, requiring the use of other instrumentation to determine EAL value.
2. Added site-specific minimum time prior to entering Refueling mode	2. Provided PINGP specific time
Difference	Added PINGP site specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CS2	Loss of RPV Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV	CS2	Loss of RPV inventory affecting core decay heat removal capability with irradiated fuel in the RPV
Mode App.	Refueling		Refueling
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	With CONTAINMENT CLOSURE <u>not</u> established: a. RPV inventory as indicated by RPV level less than {site-specific level} (6" below the low-low ECCS actuation setpoint) (BWR) (6" below the bottom ID of the RCS loop) (PWR) **<u>OR</u>** b. RPV level cannot be monitored with Indication of core uncovery as evidenced by one or more of the following: • Containment High Range Radiation Monitor reading > {site-specific} setpoint • Erratic Source Range Monitor Indication Other {site-specific} indications	CS2.1	With CONTAINMENT CLOSURE <u>not</u> established and RPV level cannot be monitored, with indication of core uncovery as evidenced by one or more of the following: • Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN 5 R/hr • Erratic Source Range Monitor Indication
Site specific	R-48 and R-49 are the PINGP High Range Containment Radiation Monitors.		
Difference	RVLIS is out of service in the Refueling mode, and there is no other level indication available after RPV level is below the bottom of the ID of the hot leg nozzle. Therefore, the EAL threshold must be based upon NEI EAL 1b criteria. This is specifically supported by NEI guidance. This is not a Deviation, as this EAL strategy is specifically supported by the NEI 99-04 technical basis guidance.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	With CONTAINMENT CLOSURE established: a. RPV inventory as indicated by RPV level less than {site-specific level} (6" below the low-low ECCS actuation setpoint) (BWR) (6" below the bottom ID of the RCS loop) (PWR) **OR** b. RPV level cannot be monitored with Indication of core uncovery as evidenced by one or more of the following: • Containment High Range Radiation Monitor reading > {site-specific} setpoint • Erratic Source Range Monitor Indication Other {site-specific} indications	CS2.2	With CONTAINMENT CLOSURE established, and RPV level cannot be monitored, with indication of core uncovery as evidenced by one or more of the following: ▪ Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN 5 R/hr ▪ Erratic Source Range Monitor Indication
Site specific	R-48 and R-49 are the PINGP High Range Containment Radiation Monitors.		
Difference	RVLIS is out of service in the Refueling mode, and there is no other level indication available after RPV level is below the bottom of the ID of the hot leg nozzle. Therefore, the EAL threshold must be based upon NEI EAL 2b criteria. This is specifically supported by NEI guidance. This is not a Deviation, as this EAL strategy is specifically supported by the NEI 99-04 technical basis guidance.		
Deviation	None		

CS2 – Basis Justification		
PINGP Specific Additions/Deletions		Justification
1. Provided explanation of why indications other than RPV level must be used.		1. NEI 99-04 guidance specific allows for not having RPV level available. PINGP EAL classification follows this guidance.
2. Added site specific information on instrumentation used at PINGP.		2. Provided necessary reference to instrumentation to be used
3. The reference to 30 minutes is deleted		3. There is no corresponding 30 minute time-related criterion in the EAL
4. Added site-specific minimum time prior to entering Refueling mode		4. Provided PINGP specific time
Difference	RPV level is unavailable at this EAL value; EAL uses alternate indication, per NEI 99-04 direction, therefore this does not represent a Deviation.	
Deviations	None.	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
CG1	Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV	CG1	Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV
Mode App.	Cold Shutdown, Refueling		Cold Shutdown, Refueling
Site specific	None.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	1. Loss of RPV inventory as indicated by unexplained {site-specific} sump and tank level increase 2. RPV Level: a. less than TOAF for > 30 minutes **OR** b. cannot be monitored with Indication of core uncovery for > 30 minutes as evidenced by one or more of the following: • Containment High Range Radiation Monitor reading > {site-specific} setpoint • Erratic Source Range Monitor Indication • Other {site-specific} indications 3. {Site-specific} indication of CONTAINMENT challenged as indicated by one or more of the following: • Explosive mixture inside containment • Pressure above {site-specific} value • CONTAINMENT CLOSURE not established • Secondary Containment radiation monitors above {site-specific} value (BWR only)	CG1.1	Loss of RPV inventory as indicated by unexplained level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms **AND** RPV Level: a. LESS THAN 63% RVLIS Full Range for GREATER THAN 30 minutes **OR** b. cannot be monitored, with indication of core uncovery for GREATER THAN 30 minutes as evidenced by one or more of the following: • Containment High Range Radiation Monitor (R48 or R49) reading GREATER THAN 5 R/hr • Erratic Source Range Monitor Indication **AND** Indication of CONTAINMENT challenged as indicated by one or more of the following: • Containment hydrogen concentration GREATER THAN OR EQUAL TO 6% • Containment pressure GREATER THAN 46 psig • CONTAINMENT CLOSURE not established

Site specific	▪ "level increase in Containment Sumps A or C, or Waste Holdup Tank as indicated by sump pump run times, levels, or alarms" are the site specific indications for potential detection of reactor vessel level inventory ▪ "LESS THAN 63% RVLIS Full Range" is equal to TOAF • Containment pressure GREATER THAN 46 psig, Hydrogen concentration in containment GREATER THAN OR EQUAL 6%, and CONTAINMENT CLOSURE not established are indications of challenge to CONTAINMENT. These setpoints are carried over from the Fission Product Barrier EALs.
Difference	None
Deviation	None

CG1 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Deleted the two paragraphs referring to evaluating sump and tank levels against other potential sources of leakage and replaced with PINGP specific information on evaluating sump and tank levels.	This information was added for explanation and clarification of site specifics.
Difference	Replaced NEI generic wording with PINGP site specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

FISSION PRODUCT BARRIER DEGRADATION

PINGP Site Specific Information/Differences/Deviations Justification Matrix

NEI IC#s	NEI IC Wording	PINGP IC#s	PINGP IC Wording
FU1	ANY Loss or ANY Potential Loss of Containment	FU1	ANY Loss or ANY Potential Loss of Containment
FA1	ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	FA1	ANY Loss or ANY Potential Loss of EITHER Fuel Cladding OR RCS
FS1	Loss or Potential Loss of ANY Two Barriers	FS1	Loss or Potential Loss of ANY Two Barriers
FG1	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier	FG1	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
N/A	ANY Loss or ANY Potential Loss of Containment	FU1	ANY Loss or ANY Potential Loss of Containment (Table F-1)
N/A	ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	FA1	ANY loss or ANY Potential Loss of EITHER Fuel Cladding OR RCS (Table F-1)
N/A	Loss or Potential Loss of ANY Two Barriers	FS1	Loss or Potential Loss of ANY Two Barriers (Table F-1)
N/A	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier	FG1	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier (Table F-1)
Site specific	Table F-1 is the plant representation of NEI Table 5-F-4 and contains the fission product barrier loss/Potential Loss thresholds that are applicable to PINGP.		
Difference	▪ Table F-1 is the plant representation of NEI Table 5-F-4 and contains the fission product barrier loss/challenge thresholds that are applicable to PINGP. ▪ These changes are not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

Fuel Clad – Loss EALs

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC Loss 1	<u>Critical Safety Function Status</u> Core-Cooling Red	FC Loss 1	<u>Critical Safety Function Status</u> Conditions requiring entry into Core Cooling-RED path
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	Added words "Conditions requiring entry into..." clarifies that classification is based upon the condition defined in the CSFST, consistent with the NEI basis for the FPBs. This change is not a deviation because it does not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC Loss 2	<u>Primary Coolant Activity Level</u> Coolant Activity GREATER THAN (site-specific) Value	FC Loss 2	<u>Primary Coolant Activity Level</u> Coolant activity GREATER THAN 300 μCi/gm I-131 equivalent
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	300 μCi/gm I-131 equivalent		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC Loss 3	<u>Core Exit Thermocouple Readings</u> GREATER THAN (site-specific) degree F	FC Loss 3	<u>Core Exit Thermocouple Readings</u> GREATER THAN 1200 degree F
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	1200 degree F		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC Loss 4	<u>Reactor Vessel Water Level</u> Not Applicable	FC Loss 4	<u>Reactor Vessel Water Level</u> Not applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC Loss 5	<u>Containment Radiation Monitoring</u> Containment rad monitor reading GREATER THAN (site-specific) R/hr	FC Loss 5	<u>Containment Radiation Monitoring</u> Containment rad monitor 1(2)R-48 or 49 reading GREATER THAN 200 R/hr
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	200 R/hr		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC Loss 6	**<u>Other (Site-Specific) Indications</u>** (Site-specific) as applicable	FC Loss 6	**<u>Other (Site-Specific) Indications</u>** RCS Letdown Line Radiation Monitor 1(2)R-9 reading GREATER THAN 10 R/hr
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	RCS Letdown Line Radiation Monitor 1(2)R-9 reading GREATER THAN 10 R/hr is a site-specific indication of fuel cladding loss.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC Loss 7	**<u>Emergency Director Judgment</u>** Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier	FC Loss 7	**<u>Emergency Director Judgment</u>** Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

Fuel Clad – Potential Loss EALs

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC P-Loss 1	**<u>Critical Safety Function Status</u>** Core Cooling-Orange OR Heat Sink-Red	FC P-Loss 1	**<u>Critical Safety Function Status</u>** Conditions requiring entry into Core Cooling-ORANGE path **OR** Conditions requiring entry into Heat Sink-RED path
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	Added words "Conditions requiring entry into..." clarifies that classification is based upon the condition defined in the CSFST, consistent with the NEI basis for the FPBs. This change is not a deviation because it does not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC P-Loss 2	**<u>Primary Coolant Activity Level</u>** Not Applicable	FC P-Loss 2	**<u>Primary Coolant Activity Level</u>** Not applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC P-Loss 3	**Core Exit Thermocouple Readings** GREATER THAN (site-specific) degree F	FC P-Loss 3	**Core Exit Thermocouple Readings** GREATER THAN 700 degrees F
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	700 degrees F		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC P-Loss 4	**Reactor Vessel Water Level** Level LESS than (site-specific) value	FC P-Loss 4	**Reactor Vessel Water Level** Level LESS THAN: ▪ 40% RVLIS Full Range (no RCPs) ▪ 32% RVLIS Dynamic Head Range (1 RCP) ▪ 62% RVLIS Dynamic Head Range (2 RCPs)
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	Level LESS THAN Level LESS THAN: ▪ 40% RVLIS Full Range (no RCPs) ▪ 32% RVLIS Dynamic Head Range (1 RCP) ▪ 62% RVLIS Dynamic Head Range (2 RCPs)		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC P-Loss 5	**Containment Radiation Monitoring** Not Applicable	FC P-Loss 5	**Containment Radiation Monitoring** Not applicable.
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC P-Loss 6	**Other (Site-Specific) Indications** (Site-specific) as applicable	FC P-Loss 6	Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
FC P-Loss 7	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier	FC P-Loss 7	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Fuel Clad Barrier
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

Fuel Clad Barrier - Loss and/or Potential Loss Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
1. <u>Critical Safety Function Status</u> • Additional information specific to the conditions that constitute Red/Orange paths is provided for user determination of EAL. • Clarified that classification takes place when conditions exist, regardless of status of EOP use be Operations staff	1. <u>Critical Safety Function Status</u> Per NEI guidance, EAL should be determined using same indications and values of EOP, if possible.
2. <u>Primary Coolant Activity Level</u> None	2. <u>Primary Coolant Activity Level</u> N/A
3. <u>Core Exit Thermocouple Readings</u> None; Site Specific values are repeated	3. <u>Core Exit Thermocouple Readings</u> N/A
4. <u>Reactor Vessel Water Level</u> The basis for the RVLIS values used for the EAL are provided.	4. <u>Reactor Vessel Water Level</u> Provide the relationship with EOP Orange Path for Core Cooling
5. <u>Containment Radiation Monitoring</u> The basis for using the high range radiation monitors for use in classification is explained	5. <u>Containment Radiation Monitoring</u> Provide understanding in confidence of accuracy of instrumentation for the readings in the range of interest.
6. <u>Other Indications</u> The radiation monitor used as an additional means of detecting failed fuel is described, and the basis for the expected reading (off scale high).	6. <u>Other Indications</u> The radiation monitor provides an unambiguous indication to detect and/or confirm failed fuel. The expected limitations and expected values to be seen are explained for the information of the EAL user
7. <u>Emergency Director Judgment</u> Specific considerations are provided to consider in Emergency Director "judgment".	7. <u>Emergency Director Judgment</u> Clarifying the criteria to consider in making ED judgment is of value in determining if other conditions or factors exist they may challenge FPB integrity. The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that appears appropriate here. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.

Difference	Added site-specific and supplemental information to the basis.
Deviations	None

RCS Barrier – Loss EALs

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS Loss 1	**Critical Safetv Function Status** Not Applicable	RCS Loss 1	**Critical Safetv Function Status** Not applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS Loss 2	**RCS Leak Rate** GREATER THAN available makeup capacity as indicated by a loss of RCS subcooling	RCS Loss 2	**RCS Leak Rate** GREATER THAN available makeup capacity as indicated by a loss of RCS subcooling LESS THAN OR EQUAL TO 20 [35]* degree F *Adverse containment conditions are defined as a containment pressure greater than 5 psig or containment radiation level greater than 1E4 R/Hr.
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	• Added specific threshold value for loss of RCS subcooling (LESS THAN OR EQUAL TO 20 [35]* degree F), consistent with PINGP EOPs • "* Adverse containment conditions are defined as a containment pressure greater than 5 psig or containment radiation level greater than 1E4 R/Hr" supplements the site specific EAL information, such it is clear to those classifying the IC that the value will change under Adverse containment conditions.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS Loss 3	<u>**SG Tube Rupture**</u> SGTR that results in an ECCS (SI) Actuation	RCS Loss 3	<u>**SG Tube Rupture**</u> SGTR that results in an ECCS (SI) Actuation
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS Loss 4	<u>**Containment Radiation Monitoring**</u> Containment rad monitor reading GREATER THAN (site-specific) R/hr	RCS Loss 4	<u>**Containment Radiation Monitoring**</u> Containment rad monitor 1(2)R-48 or 49 reading GREATER THAN 7 R/hr
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	7 R/hr		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS Loss 5	<u>**Other (Site-Specific) Indications**</u> (Site-specific) as applicable	RCS Loss 5	<u>**Other (Site-Specific) Indications**</u> Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS Loss 6	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicate Loss or Potential Loss of the RCS Barrier	RCS Loss 6	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicate Loss or Potential Loss of the RCS Barrier
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

RCS Barrier – Partial Loss EALs

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS P-Loss 1	<u>Critical Safety Function Status</u> RCS Integrity-Red OR Heat Sink-Red	RCS P-Loss 1	<u>Critical Safety Function Status</u> Conditions requiring entry into RCS Integrity-RED path **OR** Conditions requiring entry into Heat Sink-RED path
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	Added words "Conditions requiring entry into..." clarifies that classification is based upon the condition defined in the CSFST, consistent with the NEI basis for the FPBs. This change is not a deviation because it does not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL.		
Deviation	None		

NEI EAL#	NEI IC Wording	PINGP EAL#(s)	PINGP IC Wording
RCS P-Loss 2	<u>RCS Leak Rate</u> Unisolable leak exceeding the capacity of one charging pump in the normal charging mode	RCS P-Loss 3	<u>RCS Leak Rate</u> Unisolable leak exceeding 60 gpm
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	Added the parenthetical phrase "60 gpm" for clarification: 60 gpm is the nominal flow capacity for each charging pump. This change is not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS P-Loss 3	<u>**SG Tube Rupture**</u> Not Applicable	RCS P-Loss 3	<u>**SG Tube Rupture**</u> Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS P-Loss 4	<u>**Containment Radiation Monitoring**</u> Not Applicable	RCS P-Loss 4	<u>**Containment Radiation Monitoring**</u> Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS P-Loss 5	<u>**Other (Site-Specific) Indications**</u> (Site-specific) as applicable	RCS P-Loss 5	<u>**Other (Site-Specific) Indications**</u> Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Hot Standby, Startup, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
RCS P-Loss 6	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicate Loss or Potential Loss of the RCS Barrier	RCS P-Loss 6	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicate Loss or Potential Loss of the RCS Barrier
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Hot Standby, Startup, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

RCS Barrier - Loss and/or Potential Loss Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
1. Critical Safety Function Status • Additional information specific to the conditions that constitute Red/Orange paths is provided for user determination of EAL. • Clarified that classification takes place when conditions exist, regardless of status of EOP use be Operations staff	1. Critical Safety Function Status Per NEI guidance, EAL should be determined using same indications and values of EOP, if possible.
2. RCS Leak Rate The basis for the specific value of the capacity of one charging pump is provided	2. RCS Leak Rate Provide understanding of origin of the flow rate
3. SG Tube Rupture The system parameters which are the source of the "ECCS (SI)" are described	3. SG Tube Rupture Provide understanding of origin of the flow rate to EAL user
4. Containment Radiation Monitoring The basis for using the high range radiation monitors for use in classification is explained	4. Containment Radiation Monitoring Provide understanding in confidence of accuracy of instrumentation for the readings in the range of interest.
5. Other Indications Stated that there are no other indications, other than those already provided, that provide unambiguous determination of loss or potential loss of RCS barrier.	5. Other Indications Explanation to reader/reviewer that other indications were considered (as opposed to the simple statement of "not applicable")
6. Emergency Director Judgment Specific considerations are provided to consider in Emergency Director "judgment".	6. Emergency Director Judgment Clarifying the criteria to consider in making ED judgment is of value in determining if other conditions or factors exist they may challenge FPB integrity. The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that appears appropriate here. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.

Difference	Added site-specific and supplemental information to the basis.
Deviations	None

Containment Barrier –Loss EALs

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT Loss 1	<u>Critical Safety Function Status</u> Not Applicable	CMT Loss 1	<u>Critical Safety Function Status</u> Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT Loss 2	<u>Containment Pressure</u> Rapid unexplained decrease following initial increase OR Containment pressure or sump level response not consistent with LOCA conditions	CMT Loss 2	<u>Containment Pressure</u> Rapid unexplained decrease following initial increase **OR** Containment pressure or sump level response not consistent with LOCA conditions
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT Loss 3	**Core Exit Thermocouple Readings** Not applicable	CMT Loss 3	**Core Exit Thermocouple Readings** Not applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT Loss 4	**SG Secondary Side Release with P-to-S Leakage** RUPTURED S/G is also FAULTED outside of containment OR Primary-to-Secondary leakrate greater than 10 gpm with nonisolable steam release from affected S/G to the environment	CMT Loss 4	**SG Secondary Side Release with P-to-S Leakage** RUPTURED S/G is also FAULTED outside of containment **OR** Primary-to-secondary leakrate GREATER THAN 10 gpm with nonisolable steam release from affected S/G to the environment
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT Loss 5	**<u>CNMT Isolation Valves Status After CNMT Isolation</u>** Valve(s) not closed AND downstream pathway to the environment exists	CMT Loss 5	**<u>CNMT Isolation Valves Status After CNMT Isolation</u>** Containment isolation Valve(s) not closed **AND** Downstream pathway to the environment exists after Containment Isolation
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	▪ "after Containment isolation" was added to address the NEI title for this section. ▪ Containment isolation valve(s)" wording was used to address the NEI title wording ▪ These changes are not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT Loss 6	**<u>Significant Radioactive Inventory in Containment</u>** Not Applicable	CMT Loss 6	**<u>Significant Radioactive Inventory in Containment</u>** Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT Loss 7	**Other (Site-Specific) Indications** (Site-specific) as applicable	CMT Loss 7	**Other (Site-Specific) Indications** Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT Loss 8	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment barrier	CMT Loss 8	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment barrier
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

Containment Barrier – Partial Loss EALs

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT P-Loss 1	**Critical Safety Function Status** Containment-Red	CMT P-Loss 1	**Critical Safety Function Status** Conditions requiring entry into Containment-RED path
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	Added words "Conditions requiring entry into..." to clarify that classification is based upon the condition defined in the CSFST as opposed to when the transition is made into the CSFST procedure. This change is not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT P-Loss 2	**Containment Pressure** (Site-specific) PSIG and increasing OR Explosive mixture exists OR Pressure greater than containment depressurization actuation setpoint with less than one full train of depressurization equipment operating	CMT P-Loss 2	**Containment Pressure** 46 PSIG and increasing OR Containment hydrogen concentration GREATER THAN OR EQUAL TO 6% OR Containment pressure GREATER THAN 23 psig with LESS THAN one full train of depressurization equipment operating
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	"46 psig".		
Difference	• Hydrogen concentration in containment GREATER THAN OR EQUAL TO 6% - Hydrogen concentration is specified in the NEI basis for explosive mixture. • Added the parenthetical phrase "23 psig" for clarification. 23 psig is the site specific depressurization actuation setpoint. • Added the word "Containment" for clarification of which pressure. • These changes are not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT P-Loss 3	<u>Core Exit Thermocouple Readings</u> Core exit thermocouples in excess of 1200 degrees and restoration procedures not effective within 15 minutes; or, core exit thermocouples in excess of 700 degrees with reactor vessel level below top of active fuel and restoration procedures not effective within 15 minutes	CMT P-Loss 3	<u>Core Exit Thermocouple Readings</u> Core exit thermocouples in excess of 1200 degrees F and restoration procedures not effective within 15 minutes; **OR** Core exit thermocouples in excess of 700 degrees F with reactor vessel level below 40% RVLIS Full Range and restoration procedures not effective within 15 minutes
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	• "below 40% RVLIS Full Range" provides the PINGP specific indication for TOAF. • Provided explicit "OR" logic for the two distinct EAL conditions • These changes are not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT P-Loss 5	<u>CNMT Isolation Valves Status After CNMT Isolation</u> Not Applicable	CMT P-Loss 5	<u>CNMT Isolation Valves Status After CNMT Isolation</u> Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT P-Loss 6	**Significant Radioactive Inventory in Containment** Containment rad monitor reading GREATER THAN (site-specific) R/hr	CMT P-Loss 6	**Significant Radioactive Inventory in Containment** Containment rad monitor 1(2)R-48 or 49 GREATER THAN 800 R/hr
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	800 R/hr		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT P-Loss 7	**Other (Site-Specific) Indications** (Site-specific) as applicable	CMT P-Loss 7	**Other (Site-Specific) Indications** Not Applicable
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
CMT P-Loss 8	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment barrier	CMT P-Loss 8	**Emergency Director Judgment** Any condition in the opinion of the Emergency Director that indicates Loss or Potential Loss of the Containment barrier
Mode App.	Power Operation, Hot Standby, Startup, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	N/A		
Difference	None		
Deviation	None		

Containment Barrier - Loss and/or Potential Loss Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
1. **Critical Safety Function Status** • Additional information specific to the conditions that constitute Red/Orange paths is provided for user determination of EAL. • Clarified that classification takes place when conditions exist, regardless of status of EOP use by Operations staff	1. **Critical Safety Function Status** Per NEI guidance, EAL should be determined using same indications and values of EOP, if possible.
2. **Containment Pressure** • PINGP specific values for EAL thresholds are provided • An understanding is provided that for an explosive hydrogen mixture to be present in Containment, FC and RCS barriers must already have occurred. • The components and conditions needed for a "full train of depressurization equipment operation" are provided.	2. **Containment Pressure** Provide additional insight on status of systems and FCBs for more accurate and timely classification
3. **Core Exit Thermocouple Readings** Correlation between EAL values and PINGP CSFSTs is provided	3. **Core Exit Thermocouple Readings** Per NEI guidance, EAL should be determined using same indications and values of EOP, if possible.
4. **SG Secondary Side Release with P-to-S Leakage** • Explanation of RUPTURED and FAULTED is provided • A paragraph providing historical context on how the EAL value evolved was deleted	4. **SG Secondary Side Release with P-to-S Leakage** • Provides EAL user accessible information for classification of SG condition and the event • The historical context is of no pertinence to the user making the classification of event
5. **Containment Isolation Valve Status After Containment Isolation** None	5. **Containment Isolation Valve Status After Containment Isolation** N/A
6. **Significant Radioactivity in Containment** The basis for using the high range radiation monitors for use in classification is explained	6. **Significant Radioactivity in Containment** Provide understanding in confidence of accuracy of instrumentation for the readings in the range of interest
7. **Other Indications** Stated that there are no other indications, other than those already provided, that provide unambiguous determination of loss or potential loss of containment.	7. **Other Indications** Explanation to reader/reviewer that other indications were considered (as opposed to the simple statement of "not applicable")
8. **Emergency Director Judgment** Specific considerations are provided to consider in Emergency Director "judgment".	8. **Emergency Director Judgment** Clarifying the criteria to consider in making ED judgment is of value in determining if other conditions or factors exist they may challenge FPB integrity. The additional bulleted items in the basis for Emergency Director judgment are an amalgam of bases information from NEI 99-01 revision 4. The first bulleted item comes from the notes on Table 5-F-1 as well as sections 3.9 and 3.10 of the NEI document regarding "imminent" barrier loss. The second bulleted item is from the bases of IC SG1, loss of all AC, regarding degraded barrier monitoring capability that appears appropriate here. The third bulleted item also comes from the IC SG2 as well as SG2 (ATWS) regarding the importance of the use of Emergency Director judgment to make anticipatory declarations based on FPB monitoring.

Difference	Added site-specific and supplemental information to the basis.
Deviations	None

EVENTS RELATED TO ISFSI MALFUNCTION

PINGP Site Specific
Information/Differences/Deviations
Justification Matrix

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
E-HU1	Damage to loaded cask CONFINEMENT BOUNDARY.	EU1	Damage to loaded cask CONFINEMENT BOUNDARY.
Mode App.	Not Applicable		Not Applicable
Difference	Deleted "H" from IC number to avoid confusion with "Hazards" category.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Natural phenomena events affecting a loaded cask CONFINEMENT BOUNDARY. (site specific list)	EU1.1	Natural phenomena events affecting a loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask. • earthquake • tornado (and tornado missile) • flood • lightning • snow/ice
Site specific	▪ A list of natural phenomena is listed as provided in the SAR. • earthquake • tornado (and tornado missile) • flood • lightning • snow/ice		
Difference	"as indicated by VISIBLE DAMAGE to the cask" added to determine potential for natural phenomena events to have had an effect on the CONFINEMENT BOUNDARY.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Accident conditions affecting a loaded cask CONFINEMENT BOUNDARY. (site-specific list)	EU1.2	Accident conditions affecting a loaded cask CONFINEMENT BOUNDARY as indicated by VISIBLE DAMAGE to the cask. • dropped cask • tipped over cask • cask burial • explosion • fire
Site specific	▪ A list of accident conditions as described in the SAR. • dropped cask • tipped over cask • cask burial • explosion • fire		
Difference	▪ "as indicated by VISIBLE DAMAGE to the cask" added to determine potential for natural phenomena events to have had an effect on the CONFINEMENT BOUNDARY.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
3	Any condition in the opinion of the Emergency Director that indicates loss of loaded fuel storage cask CONFINEMENT BOUNDARY.	EU1.3	Any condition in the opinion of the Emergency Director that indicates loss of loaded fuel storage cask CONFINEMENT BOUNDARY.
Site specific	None		
Difference	None		
Deviation	None		

EU1 – Basis Justification	
Specific Additions/Deletions	**Justification**
• Repeated NEI definition of CONFINEMENT • Provided clarification on why "as indicated by VISIBLE DAMAGE to the cask" was the appropriate criteria to use for EU1.1 and 1.2	Facilitate use of EALs in classification

Difference	Provided clarification on why "as indicated by VISIBLE DAMAGE to the cask" was the appropriate criteria to use for EU1.1 and 1.2. This is consistent with the intent of the NEI EALs and does not change the threshold at which a UE would be declared, in particular when the UE can be declared by EU3 (Emergency Director judgment. Accordingly, this Difference does not represent a deviation.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
E-HU2	Confirmed Security Event with potential loss of level of safety of the ISFSI.	EU2	Confirmed Security Event with potential loss of level of safety of the ISFSI.
Mode App.	Not Applicable		Not Applicable
Difference	Deleted "H" from IC number to avoid confusion with "Hazards" category.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Security Event as determined from (site-specific) Security Plan and reported by the (site-specific) security shift supervision.	EU2.1	Security Contingency Event as determined from PINGP Security Plan and reported by the PINGP security shift supervision.
Site specific	• Inserted PINGP for site specific. • The site-specific term "Security Contingency Event" is used for "Security Event".		
Difference	The site-specific term "Security Contingency Event" is used for "Security Event".		
Deviation	None		

EU2 – Basis Justification	
Specific Additions/Deletions	**Justification**
Added "Security Contingency Events are those that are applicable to this EAL."	"Security Contingency Events" are those that represent a potential degradation. Other "events" are lesser items, reported as described by the NEI guidance
Difference	Added "Security Contingency Events are those that are applicable to this EAL." to clarify applicable events to those involved with classification. The threshold of event classification intended by NEI is not changed; therefore, this Difference does not represent a deviation.
Deviations	None

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

PINGP Site Specific
Information/Differences/Deviations
Justification Matrix

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HU1	Natural and Destructive Phenomena Affecting the PROTECTED AREA.	HU1	Natural and Destructive Phenomena Affecting the PROTECTED AREA.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	(Site-Specific) method indicates felt earthquake.	HU1.1	Earthquake felt in plant as indicated by VALID "Event Alarm" on Seismic Monitoring Panel.
Site specific	Added "VALID "Event Alarm" on Seismic Monitoring Panel" as PINGP site-specific method to indicate felt earthquake.		
Difference	Reversed the sentence resulting in the site-specific method stated at the end of the sentence. This meets the Fleet standard.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Report by plant personnel of tornado or high winds greater than (site-specific) mph striking within PROTECTED AREA boundary.	HU1.2	Report by plant personnel of tornado or high winds GREATER THAN 95 mph striking within PROTECTED AREA boundary.
Site specific	Added site-specific value of "95 mph" wind speed which is based on the USAR design basis. All structures are designed to withstand the maximum potential loadings resulting from a wind speed of 100 mph. However, site instrumentation will only read up to near 100 mph but not greater than or equal to 100 mph. 95 mph was chosen as the classification threshold, as this reading will be on-scale. A margin of 5 mph is considered an acceptable value for the instrumentation's accuracy.		
Difference	Used "GREATER THAN" in place of "greater than" to keep consistency in presenting the EALs.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
3	Vehicle crash into plant structures or systems within PROTECTED AREA boundary.	HU1.3	Vehicle crash into plant structures or systems within PROTECTED AREA boundary.
Site	N/A		

specific	
Difference	None
Deviation	None

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
4	Report by plant personnel of an unanticipated EXPLOSION within PROTECTED AREA boundary resulting in VISIBLE DAMAGE to permanent structure or equipment.	HU1.4	Report by plant personnel of an unanticipated EXPLOSION within PROTECTED AREA boundary resulting in VISIBLE DAMAGE to permanent structure or equipment.
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
5	Report of turbine failure resulting in casing penetration or damage to turbine or generator seals.	HU1.5	Report of turbine failure resulting in casing penetration or damage to turbine or generator seals.
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
6	Uncontrolled flooding in (site-specific) areas of the plant that has the potential to affect safety related equipment needed for the current operating mode.	HU1.6	Uncontrolled flooding in following areas of the plant that has the potential to affect safety related equipment needed for the current operating mode (Table H-1).
Site specific	The site-specific areas for this EAL are listed in Table H-1, column HU1.6.		
Difference	The word "following" replaced (site-specific) so the list could be described at the end to the EAL in the form of Table H-1.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
7	(Site Specific) occurrences affecting the PROTECTED AREA	HU1.7	High or low river water level occurrences affecting the PROTECTED AREA as indicated by: River intake level GREATER THAN 692 ft MSL OR River intake level LESS THAN 669.5 ft MSL.
Site specific	Added site-specific conditions for High or Low river water levels.		
Difference	The EAL words were restructured to describe the "High or low river water level" as the site-specific "occurrences".		
Deviation	None		

HU1 – Basis Justification	
Specific Additions/Deletions	Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
3. HU1.3 Added the phrase (land, air or water).	3. To clarify this would include any vehicle type that would cause significant damage to plant structures containing functions and systems required for safe shutdown of the plant. An example of water born would be river water-craft that may damage the emergency intake structure.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HU2	FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection.	HU2	FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	FIRE in buildings or areas contiguous to any of the following (site-specific) areas not extinguished within 15 minutes of control room notification or verification of a control room alarm: (Site-specific) list	HU2.1	FIRE in buildings or areas contiguous (in actual contact with or immediately adjacent) to any Table H-1 area not extinguished within 15 minutes of control room notification or verification of a control room alarm.
Site specific	Added site-specific list of plant VITAL Areas and other significant buildings or areas as suggested in the NEI Basis as presented in Table H-1 Column HU2.1.		
Difference	• The NEI phrase "of the following (site-specific)" was replaced with "Table H-1" that provides the site-specific list. • The phrase "(in actual contact with or immediately adjacent)" was added to the EAL to ensure the decision maker understands the meaning of "contiguous" as defined in the NEI basis.		
Deviation	None		

HU2 – Basis Justification	
Specific Additions/Deletions	Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.

3. Corrected the reference in NEI sentence: "Escalation to a higher emergency class is by IC HA2, "FIRE Affecting the Operability of Plant Safety Systems Required for the Current Operating Mode".		3. The sentence originally made reference to HA4 which is a security EAL.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HU3	Release of Toxic or Flammable Gases Deemed Detrimental to Normal Operation of the Plant.	HU3	Release of Toxic or Flammable Gases Deemed Detrimental to Normal Operation of the Plant.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Report or detection of toxic or flammable gases that has or could enter the site area boundary in amounts that can affect NORMAL PLANT OPERATIONS.	HU3.1	Report or detection of toxic or flammable gases that has or could enter the site area boundary in amounts that could affect NORMAL PLANT OPERATIONS.
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Report by Local, County or State Officials for evacuation or sheltering of site personnel based on an offsite event.	HU3.2	Report by Local, County or State Officials for evacuation or sheltering of site personnel based on an offsite event.
Site specific	None		
Difference	None		
Deviation	None		

HU3 – Basis Justification	
Specific Additions/Deletions	Justification
1. None	1. None

Difference	None
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HU4	Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant.	HU4	Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Security events as determined from (site-specific) Safeguards Contingency Plan and reported by the (site-specific) security shift supervision.	HU4.1	Security Shift Supervision reports ANY of the following: ▪ Suspected SABOTAGE device discovered within the plant PROTECTED AREA ▪ Suspected SABOTAGE device discovered outside the PROTECTED AREA or in the plant switchyard ▪ Confirmed tampering with safety-related equipment ▪ A HOSTAGE/EXTORTION situation that disrupts NORMAL PLANT OPERATIONS ▪ CIVIL DISTURBANCE or STRIKE ACTION which disrupts NORMAL PLANT OPERATIONS ▪ Internal disturbance that is not a short lived or that is not a harmless outburst involving ANY individuals within the PROTECTED AREA ▪ Malevolent use of a vehicle outside the PROTECTED AREA which disrupts NORMAL PLANT OPERATIONS
Site specific	Added the site-specific security events as determined from the PINGP Security Plan.		
Difference	Rearranged the sentence to allow for the listing of the site-specific security events.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	A credible site-specific security threat notification.	HU4.2	A credible site-specific security threat notification.
Site	None		

specific	
Difference	None
Deviation	None

HU4 – Basis Justification		
Specific Additions/Deletions	Justification	
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.	
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.	
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HU5	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a NOUE	HU5	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a UE.
Mode App.	All		All
Difference	The NEI classification "Notification of Unusual Event" has been changed to "Unusual Event" and is abbreviated "UE" for consistency within the EALs. "UE" means Notification of Unusual Evnet.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or 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.	HU5.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or 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.
Site specific	N/A		
Difference	None		
Deviation	None		

HU5 – Basis Justification		
Specific Additions/Deletions		Justification
None		None
Difference	None	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HA1	Natural and Destructive Phenomena Affecting the Plant VITAL AREA.	HA1	Natural and Destructive Phenomena Affecting the Plant VITAL AREA.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	(Site-Specific) method indicates Seismic Event greater than Operating Basis Earthquake (OBE)	HA1.1	Seismic Event GREATER THAN Operating Basis Earthquake (OBE) as indicated by "OBE" alarm on Seismic Monitoring Panel.
Site specific	Added the "OBE alarm on Seismic Monitoring Panel" as the site-specific method of detection of OBE.		
Difference	Added the site-specific method of indication "as indicated by "OBE" alarm on Seismic Monitoring Panel" at the end of the sentence instead at the beginning of sentence.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Tornado or high winds greater than (site-specific) mph within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures / equipment or Control Room indication of degraded performance of those systems. • Reactor Building • Intake Building • Ultimate Heat Sink • Refueling Water Storage Tank • Diesel Generator Building • Turbine Building • Condensate Storage Tank • Control Room • Other (Site-Specific) Structures	HA1.2	Tornado or high winds GREATER THAN 95 mph within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures / equipment or Control Room indication of degraded performance of those systems. (Table H-1).
Site specific	▪ The site-specific list of structures or areas for this EAL are listed in Table H-1, column HA1.2. ▪ Added site-specific value of "95 mph" wind speed which is based on the USAR design basis. All structures are designed to withstand the maximum potential loadings resulting from a wind speed of 100 mph. However, site instrumentation will only read up to near 100 mph but not greater than or equal to 100		

	mph. 95 mph was chosen as the classification threshold, as this reading will be on-scale. A margin of 5 mph is considered an acceptable value for the instrumentation's accuracy.
Difference	None
Deviation	None

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
3	Vehicle crash within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures or equipment therein or control indication of degraded performance of those systems: • Reactor Building • Intake Building • Ultimate Heat Sink • Refueling Water Storage Tank • Diesel Generator Building • Turbine Building • Condensate Storage Tank • Control Room • Other (Site-Specific) Structures.	HA1.3	Vehicle crash within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following plant structures or equipment therein or Control Room indication of degraded performance of those systems (Table H-1).
Site specific	▪ The site-specific list of structures or areas for this EAL are listed in Table H-1, column HA1.3.		
Difference	Replaced "control" with "Control Room" to keep consistent with NEI HA1.2.		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
4	Turbine failure-generated missiles result in any VISIBLE DAMAGE to or penetration of any of the following plant areas: (site-specific) list.	HA1.4	Turbine failure-generated missiles result in any VISIBLE DAMAGE to or penetration of any of the following plant areas (Table H-1).
Site specific	The site-specific list of structures or areas for this EAL are listed in Table H-1, column HA1.4.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
5	Uncontrolled flooding in (site-specific) areas of the plant that results in degraded	HA1.5	Uncontrolled flooding in any Table H-1 area of the plant that results in degraded safety

	safety system performance as indicated in the control room or that creates industrial safety hazards (e.g., electric shock) that precludes access necessary to operate or monitor safety equipment.		system performance as indicated in the control room or that creates industrial safety hazards (e.g., electric shock) that precludes access necessary to operate or monitor safety equipment.
Site specific	The site-specific list of structures or areas for this EAL are listed in Table H-1, column HA1.5.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
6	(Site-Specific) occurrences within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to plant structures containing equipment necessary for safe shutdown, or has caused damage as evidenced by control room indication of degraded performance of those systems	HA1.6	High or low river water level occurrences affecting the PROTECTED AREA as indicated by: River intake level GREATER THAN 698 ft MSL OR River intake level LESS THAN 666.5 ft MSL
Site specific	Added site-specific conditions for High or Low river water levels.		
Difference	The EAL words were restructured to describe the "High or low river water level" as the site-specific "occurrences".		
Deviation	None		

HA1 – Basis Justification	
Specific Additions/Deletions	Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
<u>Difference</u>	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
<u>Deviations</u>	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HA2	FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.	HA2	FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	FIRE or EXPLOSION in any of the following (site-specific) areas: (Site-specific) list **AND** Affected system parameter indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area	HA2.1	FIRE or EXPLOSION in any of the following areas (Table H-1): **AND** Affected system parameter indications show degraded performance or plant personnel report VISIBLE DAMAGE to permanent structures or equipment within the specified area.
Site specific	The site-specific list of structures or areas for this EAL are listed in Table H-1, column HA2.1.		
Difference	None		
Deviation	None		

HA2 – Basis Justification		
Specific Additions/Deletions		Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.		1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.		2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HA3	Release of Toxic or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Establish or Maintain Safe Shutdown.	HA3	Release of Toxic or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Establish or Maintain Safe Shutdown.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Report or detection of toxic gases within or contiguous to a VITAL AREA in concentrations that may result in an atmosphere IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).	HA3.1	Report or detection of toxic gases within or contiguous to Table H-1 areas in concentrations that may result in an atmosphere IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).
Site specific	The site-specific list of structures or areas (VITAL AREA including contiguous areas) for this EAL are listed in Table H-1, column HA3.1.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Report or detection of gases in concentration greater than the LOWER FLAMMABILITY LIMIT within or contiguous to a VITAL AREA.	HA3.2	Report or detection of gases in concentration GREATER THAN the LOWER FLAMMABILITY LIMIT within or contiguous to Table H-1 areas.
Site specific	The site-specific list of structures or areas (VITAL AREA including contiguous areas) for this EAL are listed in Table H-1, column HA3.2.		
Difference	None		

Deviation	None

HA3 – Basis Justification	
Specific Additions/Deletions	Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HA4	Confirmed Security Event in a Plant PROTECTED AREA	HA4	Confirmed Security Event in a Plant PROTECTED AREA.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	INTRUSION into the plant PROTECTED AREA by a HOSTILE FORCE	HA4.1	INTRUSION into the plant PROTECTED AREA by a HOSTILE FORCE.
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording

2	Other security events as determined from (site-specific) Safeguards Contingency Plan and reported by the (site-specific) security shift supervision	HA4.2	Security Shift Supervision reports any of the following:
			• SABATOGE device discovered in the plant PROTECTED AREA
			• Standoff attack on the PROTECTED AREA by a HOSTILE FORCE (i.e., Sniper)
			• ANY security event of increasing severity that persists for > 30 min.:
			  • Credible BOMB threats
			  • HOSTAGE/EXTORTION
			  • Suspicious FIRE or EXPLOSION
			  • Significant Security System Hardware Failure
			  • Loss of Guard Post Contact

Site specific	Added the site-specific security events as determined from the PINGP Security Plan.		
Difference	Rearranged the sentence to allow for the listing of the site-specific security events.		
Deviation	None		

HA4 – Basis Justification		
Specific Additions/Deletions		**Justification**
1. In general, PINGP plant specific information added or replaced non-specific NEI information.		1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.		2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HA5	Control Room Evacuation Has Been Initiated.	HA5	Control Room Evacuation Has Been Initiated.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Entry into (site-specific) procedure for control room evacuation	HA5.1	Entry into 1(2)C1.3 AOP-1 Shutdown from Outside the Control Room or F-5 Appendix B Control Room Evacuation (Fire) for control room evacuation.
Site specific	The site specific procedures for control room evacuation were added. They are: 1(2)C1.3 AOP-1 Shutdown from Outside the Control Room and F-5 Appendix B Control Room Evacuation (Fire).		
Difference	None		
Deviation	None		

HA5 – Basis Justification	
Specific Additions/Deletions	Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HA6	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert.	HA6	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely 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	HA6.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely 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.
Site specific	N/A		
Difference	None		
Deviation	None		

HA6 – Basis Justification		
Specific Additions/Deletions		Justification
None		None
Difference	None	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HS1	Confirmed Security Event in a Plant VITAL AREA	HS1	Confirmed security event in a plant VITAL AREA
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	INTRUSION into the plant VITAL AREA by a HOSTILE FORCE	HS1.1	INTRUSION into the plant VITAL AREA by a HOSTILE FORCE.
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Other security events as determined from (site-specific) Safeguards Contingency Plan and reported by the (site-specific) security shift supervision	HS1.2	Security Shift Supervision reports ANY of the following: • A security event that results in the loss of control of ANY VITAL AREAS (other than Control Room) • Imminent loss of physical control of the facility (remote shutdown capability) due to a security event • A confirmed SABOTOGE device discovered in a VITAL AREA
Site specific	Added the site-specific security events as determined from the PINGP Security Plan.		
Difference	Rearranged the sentence to allow for the listing of the site-specific security events.		
Deviation	None		

HS1 – Basis Justification		
Specific Additions/Deletions		Justification
1. In general, PINGP plant specific information added or replaced non-specific NEI information.		1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.		2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
<u>Difference</u>	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
<u>Deviations</u>	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HS2	Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established.	HS2	Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Control room evacuation has been initiated. AND Control of the plant cannot be established per (site-specific) procedure within (site-specific) minutes	HS2.1	Control room evacuation has been initiated. AND Control of the plant cannot be established per 1(2)C1.3 AOP-1, Shutdown from Outside the Control Room or F-5 Appendix B, Control Room Evacuation (Fire) within 15 minutes.
Site specific	▪ The site specific procedures for control room evacuation were added. They are: 1(2)C1.3 AOP-1 Shutdown from Outside the Control Room and F-5 Appendix B Control Room Evacuation (Fire). ▪ 15 minutes was added per the NEI basis.		
Difference	None		
Deviation	None		

HS2 – Basis Justification	
Specific Additions/Deletions	**Justification**
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HS3	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency.	HS3	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.	HS3.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.
Site specific	N/A		
Difference	None		
Deviation	None		

HS3 – Basis Justification		
Specific Additions/Deletions		Justification
None		None
Difference	None	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HG1	Security Event Resulting in Loss Of Physical Control of the Facility.	HG1	Security Event Resulting in Loss Of Physical Control of the Facility.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions.	HG1.1	A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions as indicated by loss of physical control of EITHER: A VITAL AREA such that operation of equipment required for safe shutdown is lost OR Spent fuel pool cooling systems if imminent fuel damage is likely (e.g. freshly off-loaded reactor core in the pool).
Site specific	N/A		
Difference	Added specifics to help decision maker to understand the meaning of equipment required to maintain safety functions as described in the NEI basis. "A VITAL AREA (including the Control Room) such that operation of equipment required for safe shutdown is lost OR Spent fuel pool cooling systems if imminent fuel damage is likely" is a site specific description of equipment required to maintain safety functions.		
Deviation	None		

HG1 – Basis Justification	
Specific Additions/Deletions	**Justification**
1. In general, PINGP plant specific information added or replaced non-specific NEI information.	1. To support the PINGP specific EALs.
2. NEI EAL developmental guidance to the EAL writer was deleted.	2. NEI provided EAL developmental guidance for the writer of the site-specific EALs. Keeping the developmental guidance in the EAL basis would only distract the reader from the reading about the technical basis for the PINGP specific EALs.

	3. The sentence "Loss of physical control of the control room or remote shutdown capability alone may not prevent the ability to maintain safety functions" was moved to the first paragraph.	3. The basis communicates more clearly the applicable message.
Difference	All additions, deletions or changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
HG2	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency.	HG2	Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency.
Mode App.	All		All
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	HG2.1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.
Site specific	N/A		
Difference	None		
Deviation	None		

HG2 – Basis Justification	
Specific Additions/Deletions	Justification
None	None
Difference	None
Deviations	None

SYSTEM MALFUNCITON

PINGP Site Specific Information/Differences/Deviations Justification Matrix

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SU1	Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes	SU1	Loss of all offsite power to essential busses for GREATER THAN 15 minutes
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of power to (site specific) transformers for greater than 15 minutes **AND** At least (site specific) emergency generators are supplying power to emergency busses.	SU1.1	Loss of all offsite power to both Buses 15(25) and 16(26) for GREATER THAN 15 minutes. **AND** At least two emergency generators are supplying power to emergency buses.
Site specific	▪ "all offsite power to Buses 15(25) and 16(26)" has been used in place of "transformers" to focus the classification on the loss of offsite power capability rather than the status of one or more transformers that may or may not be capable of powering the essential buses ▪ Buses 15(25) and 16(26) identifies the site specific buses ▪ "two diesel generators" is the site specific number needed to power the emergency buses.		
Difference	"all offsite power to Buses 15(25) and 16(26)" has been used in place of "transformers" to focus the classification on the loss of offsite power capability rather than the status of one or more transformers that may or may not be capable of powering the essential buses. This simplifies the EAL wording for user classification, and meets the intent of the NEI IC by bringing information that is more specific to classification from the Basis directly to the EAL. These changes improve the usability of the EAL without changing the threshold or intent. Therefore, this is not a deviation.		
Deviation	None		

SU1 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Description of the PINGP 4160VAC safeguards power configuration was included into the EAL basis, including ability to cross-tie affected/non-affected Unit buses.	Plant specific information added into the basis.
Difference	Added site-specific information on offsite power sources. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SU2	Inability to Reach Required Shutdown Within Technical Specification Limits	SU2	Inability to reach required shutdown within Technical Specification limits
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Plant is not brought to required operating mode within (site-specific) Technical Specifications LCO Action Statement Time	SU2.1	Plant is not brought to required operating mode within Technical Specifications LCO required action statement time.
Site specific	Site specific times are not included due to the varied length of time associated with individual LCOs. Therefore, EAL is generic to cover all LCO's..		
Difference	None		
Deviation	None		

SU2 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
General PINGP plant specific information was added or replaced non-specific NEI information.	Convert NEI basis to PINGP specific basis.
Difference	Added site-specific information.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SU3	UNPLANNED Loss of Most or All Safety System Annunciation or Indication in The Control Room for Greater Than 15 Minutes	SU3	UNPLANNED loss of most or all safety system annunciation or indication in the control room for GREATER THAN 15 minutes
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	UNPLANNED loss of most or all (site-specific) annunciators or indicators associated with safety systems for greater than 15 minutes	SU3.1	UNPLANNED loss of most or all annunciators or indicators associated with safety systems for GREATER THAN 15 minutes. • Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2) NIS Racks I, II, III, IV, and ERCS Alarms
Site specific	Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2) NIS Racks I, II, III, IV, and ERCS Alarms		
Difference	None		
Deviation	None		

SU3– Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
1. General PINGP plant specific information was added or replaced non-specific NEI information.	1. Convert NEI basis to PINGP specific basis.
2. Supplemented guidance in discussion of annunciators and indication condition for classification	2. Additional guidance to facilitate use of EAL in classification
Difference	Additional guidance and site specific information added. The changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SU4	Fuel Clad Degradation	SU4	Fuel Cladding Degradation
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	(Site-specific) radiation monitor readings indicating fuel clad degradation greater than Technical Specification allowable limits	SU4.1	Radiation Monitor 1(2)R-9 GREATER THAN 2.4 R/hr indicating fuel clad degradation
Site specific	2.4R/hr on RCS Letdown Rad Monitor (1(2)R-9, or equivalent portable monitoring, correlates to fuel damage from RCS activity being at Technical Specification limits.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	(Site-specific) coolant sample activity value indicating fuel clad degradation greater than Technical Specification allowable limits	SU4.2	Coolant sample activity GREATER THAN Technical Specification 3.4.17 allowable limits indicating fuel clad degradation.
Site specific	Technical Specification 3.4.17 provides PINGP specific limits		
Difference	None		
Deviation	None		

SU4 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
General PINGP plant specific information was added or replaced non-specific NEI information.	Convert NEI basis to PINGP specific basis.
Difference	Added site specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SU5	RCS Leakage	SU5	RCS Leakage
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Unidentified or pressure boundary leakage greater than 10 gpm	SU5.1	Unidentified or pressure boundary leakage GREATER THAN 10 gpm
Site specific	N/A		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Identified leakage greater than 25 gpm	SU5.2	Identified leakage GREATER THAN 25 gpm
Site specific	N/A		
Difference	None		
Deviation	None		

SU5 – Basis Justification		
PINGP Specific Additions/Deletions		Justification
None		N/A
Difference	None	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SU6	UNPLANNED Loss of All Onsite or Offsite Communications Capabilities	SU6	UNPLANNED Loss of All Onsite or Offsite Communications Capabilities
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of all (site-specific list) onsite communications capability affecting the ability to perform routine operations	SU6.1	Loss of all Table C-1 onsite communications capability affecting the ability to perform routine operations
Site specific	Table C-1 lists onsite communications systems.		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	Loss of all (site-specific list) offsite communications capability.	SU6.2	Loss of all Table C-2 offsite communications capability.
Site specific	Table C-2 lists offsite communications systems		
Difference	None		
Deviation	None		

SU6 – Basis Justification		
PINGP Specific Additions/Deletions		**Justification**
The phrase "dedicated offsite radio channels," was added to the list of communications with offsite authorities.		The use of dedicated radio channels with state, county and tribal community is the established primary backup means of communication with the offsite authorities. The radio communication link is tested monthly.
Difference	The phrase "dedicated offsite radio channels," was added to the list of communications with offsite authorities. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SU8	Inadvertent Criticality	SU8	Inadvertent Criticality
Mode App.	Hot Standby, Hot Shutdown		Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	An UNPLANNED extended positive period observed on nuclear instrumentation	N/A	N/A
Site specific	N/A		
Difference	N/A		
Deviation	Not applicable, BWR NEI EAL.		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
2	An UNPLANNED sustained positive startup rate observed on nuclear instrumentation	SU8.1	An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.
Site specific	N/A		
Difference	NEI EAL 1, specific to BWRs, was deleted. SU8.1 is the only EAL intended to apply to PWRs		
Deviation	None		

SU8 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
None	N/A
Difference	None
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SA2	Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Scram Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Scram Was Successful	SA2	Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Reactor Trip Was Successful
Mode App.	Power Operation, Startup, Hot Standby		Power Operation, Startup, Hot Standby
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Indication(s) exist that indicate that reactor protection system setpoint was exceeded and automatic scram did not occur, and a successful manual scram occurred	SA2.1	Indication(s) exist that a Reactor Protection System setpoint was exceeded **AND** RPS automatic trip did <u>not</u> reduce power to LESS THAN 5% **AND** Any of the following operator actions are successful in reducing power to LESS THAN 5%: Manual Control Board: • Reactor Trip • AMSAC/DSS Actuation • Turbine Trip
Site specific	▪ In response to industry questions concerning the definition of a successful reactor trip, NEI and the NRC agreed in System Malfunction Question #7 of "Methodology for Development of Emergency Action Levels NUMARC/NESP-007 Rev. 2 Questions and Answers" that "...the scram is considered unsuccessful when enough control rods have not inserted to cause the reactor power to fall below that percent power associated with the ability of the safety systems to remove heat and continue to decrease." To implement the intent of this position, the PINGP EAL wording includes the phrase "...power range LESS THAN 5%." ▪ Specific reference to those main control board actions (Reactor Trip, AMSAC/DSS Actuation, Turbine Trip) that can quickly insert rods		
Difference	▪ In response to industry questions concerning the definition of a successful reactor trip, NEI and the NRC agreed in System Malfunction Question #7 of "Methodology for Development of Emergency Action Levels NUMARC/NESP-007 Rev. 2 Questions and Answers" that "...the scram is considered unsuccessful when enough control rods have not inserted to cause the reactor power to fall below that percent power associated with the ability of the safety systems to remove heat and continue to decrease." To implement the intent of this position, the PINGP EAL wording includes the phrase "...power range LESS THAN 5%." ▪ Specific reference to those main control board actions (Reactor Trip, AMSAC/DSS Actuation, Turbine Trip) that can quickly insert rods ▪ These changes clarify what constitutes an unsuccessful reactor trip, and refer to the specific alternative action for which NEI guidance allows credit. As such, these changes are not a Deviation.		
Deviation	None		

SA2 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Provided background on 5% threshold, and referenced specific plant instrumentation used to monitor reactor power and control board actions which could provide reactor trip	Amplifying and site-specific information
Difference	Added site specific and clarifying information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SA4	UNPLANNED Loss of Most or All Safety System Annunciation or Indication in Control Room With Either (1) a SIGNIFICANT TRANSIENT in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable	SA4	UNPLANNED Loss of Most or All Safety System Annunciation or Indication in Control Room With Either (1) a SIGNIFICANT TRANSIENT in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	UNPLANNED loss of most or all (site-specific) annunciators or indicators associated with safety systems for greater than 15 minutes. **AND** Either of the following: (a or b) a. A SIGNIFICANT TRANSIENT is in progress. **OR** b. Compensatory non-alarming indications are unavailable.	SA4.1	UNPLANNED loss of most or all annunciators or indicators associated with safety systems for GREATER THAN 15 minutes • Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV, and ERCS Alarms **AND** Either of the following: (a or b) a. A SIGNIFICANT TRANSIENT is in progress. **OR** b. Compensatory non-alarming indications are unavailable.
Site specific	Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV, and ERCS Alarms are the site-specific annunciators or indicators associated with safety systems		
Difference	None		
Deviation	None		

SA4 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
1. General PINGP plant specific information was added or replaced non-specific NEI information.	1. Convert NEI basis to PINGP specific basis.
2. Supplemented guidance in discussion of annunciators and indication condition for classification	2. Additional guidance to facilitate use of EAL in classification
Difference	Additional guidance and site specific information added. The changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SA5	AC power capability to essential busses reduced to a single power source for greater than 15 minutes such that any additional single failure would result in station blackout	SA5	AC power capability to essential busses reduced to a single power source for GREATER THAN 15 minutes such that any additional single failure would result in station blackout
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	AC power capability to site-specific essential busses reduced to a single power source for greater than 15 minutes **AND** Any additional single failure will result in station blackout	SA5.1	AC power capability to Safeguards Buses 15(25) and 16(26) reduced to only one of the following sources for GREATER THAN 15 minutes • CT-11 • CT-12 • 1RY • 2RY • Emergency Diesels D1 (D5) and D2 (D6) **AND** Any additional single failure will result in station blackout.
Site specific	▪ Buses 15(25) and 16(26) are the PINGP emergency safeguards buses. ▪ PINGP Site Specific power sources are: ▪ CT-11 ▪ CT-12 ▪ 1RY ▪ 2RY • D1, D2, D5, or D6 This provides a plant-specific list of AC power sources and clearly implements the intent of the generic EAL.		
Difference	None		
Deviation	None		

SA5 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Description of the PINGP 4160VAC safeguards power distribution system was included for the EAL basis.	Plant specific information added into the basis.
Difference	Added site-specific information on offsite power sources. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SS1	Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses	SS1	Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of power to (site-specific) transformers. AND Failure of (site-specific) emergency generators to supply power to emergency busses. AND Failure to restore power to at least one emergency bus within (site-specific) minutes from the time of loss of both offsite and onsite AC power	SS1.1	Loss of all offsite power to Safeguards Buses 15(25) and 16(26) AND Failure of all emergency generators to supply power to emergency Buses15(25) and 16(26). AND Failure to restore power to at least one emergency Bus within 10 minutes from the time of loss of both offsite and onsite AC power.
Site specific	▪ 15(25) and 16(26) are the PINGP emergency safeguards buses. ▪ "All" is the site-specific term for which EDGs to consider (all of them) ▪ 10 minutes is PINGP time-to-restore based on the summary for PINGP procedure 1 ECA-0.0 "Loss of All Safeguards AC Power", and associated Station Black Out Coping Study, which concludes that AC power can be supplied to one safeguards bus within 10 minutes to preclude RCS degradation		
Difference	"all offsite power to Buses 15(25) and 16(26)" has been used in place of "transformers" to focus the classification on the loss of offsite power capability rather than the status of one or more transformers that may or may not be capable of powering the essential buses. This simplifies the EAL wording for user classification, and meets the intent of the NEI IC by bringing information that is more specific to classification from the Basis directly to the EAL. As such, this is not a Deviation		
Deviation	None		

SS1 – Basis Justification		
PINGP Specific Additions/Deletions		Justification
Description of the PINGP 4160VAC safeguards power configuration was included into the EAL basis, including ability to cross-tie affected/non-affected Unit buses, and an explanation of the basis of the 10 minute restoration time.		Plant specific information added into the basis.
Difference	Added site-specific information on offsite power sources. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SS2	Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Scram Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Scram Was NOT Successful	SS2	Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Reactor Trip Was NOT Successful
Mode App.	Power Operation, Startup		Power Operation, Startup
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Indication(s) exist that automatic and manual scram were not successful	SS2.1	Indication(s) exist that automatic and manual reactor trip were NOT successful in reducing power to LESS THAN 5%.
Site specific	N/A		
Difference	"LESS THAN 5%" - In response to industry questions concerning the definition of a successful reactor trip, NEI and the NRC agreed in System Malfunction Question #7 of "Methodology for Development of Emergency Action Levels NUMARC/NESP-007 Rev. 2 Questions and Answers" that "...the scram is considered unsuccessful when enough control rods have not inserted to cause the reactor power to fall below that percent power associated with the ability of the safety systems to remove heat and continue to decrease." 5% is the power level specified in Subcriticality-RED path.		
Deviation	None		

SA2 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Provided background on 5% threshold, and referenced specific plant instrumentation used to monitor reactor power and control board actions which could provide reactor trip	Amplifying and site-specific information
Difference	Added site specific and clarifying information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SS3	Loss of All Vital DC Power	SS3	Loss of all vital DC power
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of All Vital DC Power based on (site-specific) bus voltage indications for greater than 15 minutes	SS3.1	Loss of all Safeguards DC power based on LESS THAN 112 VDC on 125VDC Panel 11(21) and Panel 12(22) for GREATER THAN 15 minutes
Site specific	LESS THAN 112 VDC on Train A and Train B DC Distribution Panels is the PINGP design voltage and specific DC sources of safety-related DC power.		
Difference	The site-specific term "Panel" is used instead of "Bus". "Safeguards" was used in place of the EAL term "Vital" as this is a site specific term. This change is not a deviation because it does not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

SS3 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
Added site-specific information on safeguards DC train and DC distribution panels, and basis for PINGP specific value representing loss of DC.	This information was added for explanation and clarification of the specific equipment involved when making determinations under this EAL.
Difference	Added site-specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SS4	Complete Loss of Heat Removal Capability	SS4	Complete Loss of Heat Removal Capability
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of core cooling and heat sink (PWR)	SS4.1	Loss of core cooling and heat sink, as indicated by conditions that require entry into: a. Core Cooling - RED path. **AND** b. Heat Sink - RED path.
Site specific	None		
Difference	"as indicated by conditions that require entry into Core Cooling - RED path AND Heat Sink - RED path." Added to provide necessary EAL threshold for Operations and EM/ED identification and classification. This is consistent with NEI intent, and with EAL thresholds use in Fission Product Barrier classification for Loss of Core Cooling and Loss of Heat Sink. This change is not a deviation because it does not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

SS4 – Basis Justification	
PINGP Specific Additions/Deletions	**Justification**
None	N/A
Difference	None
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SS6	Inability to Monitor a SIGNIFICANT TRANSIENT in Progress	SS6	Inability to Monitor a SIGNIFICANT TRANSIENT in Progress
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	a. Loss of most or all (site-specific) annunciators associated with safety systems. **AND** b. Compensatory non-alarming indications are unavailable. **AND** c. Indications needed to monitor (site-specific) safety functions are unavailable. **AND** d. SIGNIFICANT TRANSIENT in progress.	SS6.1	Loss of most or all annunciators associated with safety systems • Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV, and ERCS Alarms **AND** A SIGNIFICANT TRANSIENT in progress. **AND** Compensatory non-alarming indications are unavailable. **AND** Indications needed to monitor the ability to shut down the reactor, maintain the core cooled, maintain the reactor coolant system intact, and maintain containment intact are unavailable.
Site specific	• Main Control Boards A, B-1(2), C-1(2), D-1(2), E-1(2), F-1(2), G-1(2), NIS Racks I, II, III, IV, and ERCS Alarms contain the site-specific annunciators associated with safety systems. ▪ "the ability to shut down the reactor, maintain the core cooled, maintain the reactor system intact, and maintain containment intact" is the site specific list of safety functions		
Difference	▪ SIGNIFICANT TRANSIENT placed 2nd on list to provide user with clear escalation path criteria between EALs (Formatting change only) ▪ These changes are not a deviation because they do not alter the meaning or intent, such that classification of the event could be different between the NEI guidance and the plant EAL		
Deviation	None		

SS6 – Basis Justification			
PINGP Specific Additions/Deletions		**Justification**	
1. General PINGP plant specific information was added or replaced non-specific NEI information.		1. Convert NEI basis to PINGP specific basis.	
2. Supplemented guidance in discussion of annunciators and indication condition for classification		2. Additional guidance to facilitate use of EAL in classification	

Difference	Added site-specific information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds
Deviations	None

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SG1	Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power to Essential Busses	SG1	Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power to Essential Busses
Mode App.	Power Operation, Startup, Hot Standby, Hot Shutdown		Power Operation, Startup, Hot Standby, Hot Shutdown
Site specific	None		
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Loss of power to (site-specific) transformers. **AND** Failure of (site-specific) emergency diesel generators to supply power to emergency busses. **AND** Either of the following: (a or b) a. Restoration of at least one emergency bus within (site-specific) hours is <u>not</u> likely **OR** b. (Site-Specific) Indication of continuing degradation of core cooling based on Fission Product Barrier monitoring.	SG1.1	Loss of all offsite power to Safeguards Buses 15(25) and 16(26) **AND** Failure of all emergency diesel generators to supply power to Safeguards Buses 15(25) and 16(26) **AND** Either of the following: (a or b) a. Restoration of at least one Safeguards Bus within 4 hours is <u>not</u> likely **OR** b. Continuing degradation of core cooling based on Fission Product Barrier monitoring as indicated by conditions that require entry into Core Cooling-RED or ORANGE path
Site specific	▪ Buses 15(25) and 16(26)are the PINGP emergency safeguards buses. ▪ 4 hours is the site specific time for consideration of restoration of a Safeguards bus ▪ "Core Cooling-RED or Core Cooling-ORANGE" is PINGP site-specific indication of continuing degradation of core cooling based on Fission Product Barrier monitoring.		
Difference	"all offsite power to Buses 15(25) and 16(26)" has been used in place of "transformers" to focus the classification on the loss of offsite power capability rather than the status of one or more transformers that may or may not be capable of powering the essential buses. This simplifies the EAL wording for user classification, and meets the intent of the NEI IC by bringing information that is more specific to classification from the Basis directly to the EAL. As such, this is not a Deviation		
Deviation	None		

SG1 – Basis Justification		
PINGP Specific Additions/Deletions		**Justification**
Description of the PINGP 4160VAC safeguards power configuration was included into the EAL basis, including ability to cross-tie affected/non-affected Unit buses.		Plant specific information added into the basis.
Difference	None	
Deviations	None	

NEI IC#	NEI IC Wording	PINGP IC#(s)	PINGP IC Wording
SG2	Failure of the Reactor Protection System to Complete an Automatic Scram and Manual Scram was NOT Successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core	SG2	Failure of the Reactor Protection System to Complete an Automatic Reactor Trip and Manual Reactor Trip was NOT Successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core
Mode App.	Power Operation, Startup		Power Operation, Startup
Difference	None		
Deviation	None		

NEI EAL#	NEI EAL Wording	PINGP EAL#(s)	PINGP EAL Wording
1	Indications exist that automatic and manual scram were not successful. **AND** Either of the following: (a or b) a. Indication(s) exists that the core cooling is extremely challenged. **OR** b. Indication(s) exists that heat removal is extremely challenged	SG2.1	Indication(s) exist that automatic and manual trip were NOT successful in reducing power to LESS THAN 5%. **AND** Either of the following: (a or b) a. Core cooling is extremely challenged as indicated by conditions that require entry into Core Cooling - RED path. **OR** b. Heat removal is extremely challenged as indicated by conditions that require entry into Heat Sink - RED path.
Site specific	N/A		
Difference	▪ "Core Cooling-RED" represents the site-specific indication that core cooling is extremely challenged. ▪ "Heat Sink-RED" represents the site-specific indication that heat removal is extremely challenged. ▪ LESS THAN 5%- In response to industry questions concerning the definition of a successful reactor trip, NEI and the NRC agreed in System Malfunction Question #7 of "Methodology for Development of Emergency Action Levels NUMARC/NESP-007 Rev. 2 Questions and Answers" that "...the scram is considered unsuccessful when enough control rods have not inserted to cause the reactor power to fall below that percent power associated with the ability of the safety systems to remove heat and continue to decrease." 5% is the power level specified in Subcriticality-RED path.		
Deviation	None		

SA2 – Basis Justification		
PINGP Specific Additions/Deletions		Justification
Provided background on 5% threshold, and referenced specific plant instrumentation used to monitor reactor power		Amplifying and site-specific information
Difference	Added site specific and clarifying information. Changes described above are differences and not deviations, as the changes in the basis section do not change the EAL intended thresholds.	
Deviations	None	

ATTACHMENT 4

PROPOSED EMERGENCY PLAN CHANGES

PINGP Proposed Changes to the Emergency Plan

Attached are the specific pages of the PINGP Emergency Plan that will be revised for implementation of the NEI 99-01, Rev. 4 EAL scheme. These changes to the PINGP Emergency Plan will ensure alignment with the NEI 99-01 EAL scheme.

Attached are the proposed edited Emergency Plan pages:

- Page 7 – updated the definition of EAL to match the NEI definition
- Pages 11 through 15 – updated the four classification descriptions to match the NEI descriptions and updated the site-specific EAL basis document to be the NEI 99-01.
- Annex A Title Page – updated the Annex to include the new NEI based ICs & EALs.
- Annex A Emergency Action Level Matrix – updated the Annex to include the proposed NEI based ICs & EALs as presented in Hot Conditions EAL Matrix and Cold Conditions EAL Matrix.

  The EAL Matrix provides the detailed set of Initiating Conditions (ICs) and Emergency Action Levels (EALs) applicable to the Prairie Island Nuclear Generating Plant (PINGP) using the EAL scheme basis found in NEI 99-01 Revision 4.

  The primary tool for determining the emergency classification level is the Emergency Action Level Matrix. The user of the Emergency Action Level Matrix may (but is not required to) consult the EAL Technical Basis Document in order to obtain additional information concerning the EALs under classification consideration.

  The matrix information (ICs and EALs) will be implemented in an Emergency Plan Implementing Procedure. The Technical Basis Document will be referred to as a document that may be consulted if additional information is required. Any changes to the approved Emergency Plan ICs and EALs or to the Technical Basis Document will be conducted in accordance with 10 CFR 50.54(q).

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1.0 DEFINITIONS

Listed below are some terms in this plan along with the definitions that should be applied to these terms when they are used in this plan.

1.1 Assessment Action - Actions taken during or after an accident to obtain and process information necessary to make decisions regarding emergency measures.

1.2 Corrective Actions - Emergency measures taken to terminate an emergency situation at or near the source in order to prevent or minimize a radioactive release, e.g., shutting down equipment, firefighting, repair and damage control, etc.

1.3 Emergency Action Level (EAL) - A predetermined, site-specific, observable threshold for a plant Initiating Condition that places the plant in a given emergency class. An EAL can be: an instrument reading; an equipment status indicator; a measurable parameter (onsite or offsite); a discrete, observable event; results of analyses; entry into specific emergency operating procedures; or another phenomenon which, if it occurs, indicates entry into a particular emergency class.~~Specific instrument readings, surface or airborne contamination levels or radiation dose rates that designate a specific emergency class requiring emergency measures for that class.~~

1.4 Emergency Director (ED) - The Plant Manager or designee. This individual has overall responsibility and authority for managing the emergency effort within the plant. This person will also manage efforts external to the plant until the Emergency Operations Facility (EOF) Organization can relieve the ED of external tasks.

1.5 Emergency Manager (EM) - A designated member of site management. This person has the authority and responsibility for the management of NMC's (Nuclear Management Company's) overall response to an emergency. The EM will assume command and control at the Emergency Operations Facility and direct the NMC response efforts.

1.6 Emergency Planning Zones - a defined area around the plant to facilitate emergency planning by state and local authorities, to assure that prompt and effective actions are taken to protect the public in the event of a release of radioactive material. It is defined for:

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3.0 SUMMARY

Abnormal events, both realized and potential, requiring emergency preparedness response are classified into four classes of Emergency Action Levels. The four levels of emergency classes, in increasing order of severity are:

3.1 Notification of Unusual Event (UE)

3.2 Alert

3.3 Site Area Emergency (SAE)

3.4 General Emergency (GE)

Each class requires specific immediate actions on the part of the plant staff in order to protect the public, plant personnel and property. As the severity level of the emergency increases, so does the response of the offsite agencies, in order to protect the public.

The lowest class (least severe) is the Notification of Unusual Event, and will be handled mainly by plant personnel, with only advisory notification to local and state authorities. The Alert Classification requires prompt notification of local and state authorities, which will place their various organizations in a standby mode. In both the Notification of Unusual Event and the Alert Classification, the plant staff is expected to restore the situation to normal without further or minimum involvement of offsite authorities. The two higher severity classes, the Site Area and General Emergency, (the General Emergency being the most severe), requires prompt notification of offsite authorities with immediate involvement of those organizations to assess the emergency situation and to implement the required protective actions for the general public.

During an Alert, Site Area, or General Emergency, Prairie Island Nuclear Generating Plant will automatically activate their site and offsite support emergency response organizations. The normal site organization will staff the Plant Emergency Response Organization and the Emergency Operations Facility (EOF) Organization. The offsite organization will be staffed by members of the Mo & PI Offsite Organization and be located at the Minnesota Emergency Operations Center. Mo & PI Offsite Organization will communicate to the plant via the EOF Organization. The EOF Organization will support emergency response for the plant and relieve plant personnel of offsite activities who may be needed for plant activities.

When plant conditions stabilize and the potential for future degradation of plant conditions is small, the plant may terminate the emergency classification. If severe equipment or core damage has occurred, a transition to a recovery phase may be warranted. In general terms, an Unusual Event or Alert may be terminated without transition to Recovery while a Site Area Emergency or General Emergency will probably necessitate a planned transition to Recovery and the establishment of a Recovery Organization. The Recovery Organization will manage the overall recovery or post-accident outage plans as work is done to return the plant to a normal operational or shutdown status.

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4.0 EMERGENCY CONDITIONS

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4.1 Classification System

Four classes of Emergency Action Levels are established, according to severity, taking into consideration potential as well as actual events in progress.

Emergency Action Levels (EALs) are plant-specific indications, conditions or instrument readings that are utilized to classify emergency conditions.~~specific instrument readings, surface or airborne contamination levels, radiation dose rates (actual or projected) or other significant criteria that designate a specific emergency class requiring emergency measures for that class.~~

Annex A contains the ~~is a summary of the Emergency Classification and~~ Emergency Action Level Matrix scheme ~~-with examples of initiating conditions~~, as established by NEI 99-01 (NUMARC/NESP-007) Revision 4, which represents the most recently NRC endorsed methodology per RG 1.101 Rev 4, "Emergency Planning and Preparedness for Nuclear Power Reactors." ~~Appendix 1 of NUREG-0654. Specific instrument parameters, equipment status, or other specific criteria are listed to aid in classifying the emergency condition.~~

~~Also included in Annex A are accidents analyzed in the Prairie Island Final Safety Analysis Report (FSAR) which consider the consequences of potential radiological accidents ranging from accidents having no offsite radiation consequences to accidents causing releases of radioactive materials to the environment.~~

It should be noted that various events could require a graded scale of response. A minor incident could increase in severity and advance to the next class of emergency. This Emergency Plan is constructed to provide for a smooth transition from one class to another.

4.1.1 <u>Notification of Unusual Event (UE)</u>

Notification of Unusual Events are events that are in ~~progress~~ process or 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.

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The purpose of the Notification of Unusual Event action level is to: (1) have the operating staff come to a state of readiness from the standpoint of emergency response in the event the handling of the initiating condition requires escalation to a more severe action level class; and (2) provide for systematic handling of unusual event information, i.e., to provide early and prompt notification of minor events which could lead to more serious consequences given operator error or equipment failure or which might be indicative of more serious conditions which are not yet fully realized.

4.1.2 Alert

At the Alert action level, events are in ~~progress~~ process or have occurred which involve actual or potential substantial degradation of the level of safety of the plant. ~~It is the lowest level when some necessity for emergency planning and response offsite is necessary.~~ Any ~~radioactive~~ releases ~~will~~ expected to be limited to a small fractions of the EPA Protective Action Guideline exposure levels.

The purpose of the Alert action level is to: (1) assure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required; and (2) provide offsite authorities current status information, i.e., early and prompt notification of minor events which could lead to more serious consequences given operator error or equipment failure or which might be indicative of more serious conditions which are not yet fully realized.

4.1.3 Site Area Emergency

~~The~~ At the Site Area Emergency action level, ~~describes~~ events ~~that~~ are in process~~progress~~ or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. ~~It reflects conditions where significant offsite releases are likely to occur or are occurring but where a core melt situation is not expected although severe fuel damage may have occurred.~~

Any ~~radioactive~~ releases are not expected to result in exposure levels which exceed ~~the~~ EPA Protective Action Guideline exposure levels beyond ~~except near~~ the site boundary.

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In this situation full mobilization of emergency personnel in the near-site environs is warranted, as well as, dispatch of monitoring teams and associated communications.

The purpose of the Site Area Emergency action level is to: (1) assure that response centers are manned; (2) assure that monitoring teams are dispatched; (3) assure that personnel required for evacuation of near-site areas are at duty stations if the situation becomes more serious; (4) provide current information for and consultation with offsite authorities; and (5) provide updates for the public through offsite authorities.

4.1.4 General Emergency

At t~~T~~he General Emergency action level, ~~describes~~ events are in process ~~progress~~ or ~~which~~ have occurred which involve actual or imminent substantial core degradation or melting with ~~the~~ potential for loss of containment integrity.

~~Radioactive r~~Releases can be reasonably expected to exceed ~~the~~ EPA Protective Action Guidelines exposure levels offsite for more than the immediate site area.

The purpose of the General Emergency class is to: (1) initiate predetermined protective actions for the public; (2) provide continuous assessment of information from licensee and offsite organization measurements; (3) initiate additional measures as indicated by actual or potential releases; (4) provide consultation with offsite authorities; and (5) provide updates for the public through offsite authorities.

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Annex A

EMERGENCY ACTION LEVELS

The site-specific Emergency Action Levels are presented in the attached Emergency Action Level Matrix, PINGP 1576, Draft. These EALs are based on the NEI 99-01 EAL scheme.

Emergency Plan Implementing Procedure F3-2 also contains the same Emergency Action Level Matrix PINGP 1576.

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
[illegible]	[illegible]	[illegible]	[illegible]

Draft G 10-17-04
For Review Only

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
[illegible]	[illegible]	[illegible]	[illegible]

Table F-1 FISSION PRODUCT BARRIER REFERENCE TABLE

Fuel Cladding Barrier		RCS Barrier		Containment Barrier	
Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Modes: 1 Power Operation, 2 Startup, 3 Hot Standby, 4 Hot Shutdown, 5 Cold Shutdown, 6 Refueling, DEF Defueled

HOT CONDITIONS (RCS > 200°F)

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
—	—	[illegible]	[illegible]

Draft II 10-19-04
For Review Only

Modes: 1 Power Operation 2 Startup 3 Hot Standby 4 Hot Shutdown 5 Cold Shutdown 6 Refueling DEF Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
—	—	[illegible]	[illegible]

COLD CONDITIONS (RCS ≤ 200°F)

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED: "PRAIRIE ISLAND NUCLEAR GENERATING PLANT EMERGENCY ACTION LEVEL MATRIX (COLD CONDITIONS (RCS </- 200°F))"

WITHIN THIS PACKAGE

D-01

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED: "PRAIRIE ISLAND NUCLEAR GENERATING PLANT EMERGENCY ACTION LEVEL MATRIX (HOT CONDITIONS (RCS > 200°F))"

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D-02

ENCLOSURE 5

COMPACT DISK OF ENCLOSURE 4 AND REFERENCES

NOTE 1: The reference sections of the proposed Technical Basis Document contain cross-reference numbers that correspond to the specific electronic references on the CD. Each reference file is assigned a cross-reference number in the Reference Directory. This same cross-reference number is listed after each reference in the electronic version of the proposed Technical Basis Document.

NOTE 2: A site electrical distribution system drawing is included on the CD.