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10 CFR 50.90
10 CFR 50 Appendix E, Section IV.B

April 30, 2015
Serial: HNP-15-025

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

Shearon Harris Nuclear Power Plant (HNP), Unit 1
Docket No. 50-400
Renewed License No. NPF-63

Subject: License Amendment Request to Adopt Emergency Action Level Scheme Pursuant to NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors"

Ladies and Gentlemen:

In accordance with the provisions of 10 CFR 50.90 and 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," Section IV.B, Duke Energy Progress, Inc., (Duke Energy) is requesting approval of a proposed change in the Emergency Action Levels (EALs) used at the Shearon Harris Nuclear Plant (HNP), Unit 1.

Duke Energy is proposing to change the EALs from a scheme based upon Revision 5 of NEI 99-01, "Methodology for Development of Emergency Action Levels," to one based upon Revision 6 of NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors." This change in scheme requires NRC approval prior to implementation.

The revised EALs will be implemented as two charts, one based upon Operating Modes 1, 2, 3, and 4 (hot operating conditions), and one based upon Operating Modes 5, 6, and Defueled (cold operating conditions). Initiating conditions that are applicable to both hot and cold operating conditions are provided on both charts.

Enclosure 1 provides an evaluation of the proposed change to the EAL scheme. Enclosure 2 provides a comparison matrix between the NEI 99-01, Revision 6, EALs and the proposed HNP EALs. This matrix identifies and provides justification for all differences from the NEI 99-01, Revision 6, EALs. Enclosure 3 provides the EAL Technical Bases Document (clean version) for HNP. Enclosure 4 provides a redline and strikeout version of the EAL Technical Bases Document for HNP that shows site specific changes to the generic guidance. Enclosure 5 provides the supporting calculation for the HNP EAL Table R-1, "Effluent Monitor Classification Thresholds." Enclosure 6 provides the proposed HNP EAL Wallcharts.

Duke Energy requests approval of the proposed EAL scheme by April 30, 2016, with a 180-day implementation period.

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NRR

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated North Carolina State Official.

This letter contains a regulatory commitment as identified in Enclosure 7.

Should you have any questions regarding this submittal, please contact Dave Corlett, HNP Regulatory Affairs Manager, at (919)-362-3137.

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 30, 2015.

Sincerely,

Benjamin C. Waldrep

Enclosures:

1. Evaluation of Proposed Change
2. Harris Nuclear Plant NEI 99-01 Revision 6 EAL Comparison Matrix
3. Harris Nuclear Plant Emergency Action Level Technical Bases Document, EP-EAL, "Emergency Action Level Technical Bases" (Clean Version)
4. Harris Nuclear Plant Emergency Action Level Technical Bases Document, EP-EAL, "Emergency Action Level Technical Bases" (Redline and Strikeout Version)
5. Supporting Calculation for Harris Nuclear Plant Radiological Effluent EAL Values
6. Harris Nuclear Plant Emergency Action Level Wallcharts
7. Regulatory Commitment

cc: Mr. J. D. Austin, NRC Sr. Resident Inspector, HNP
Mr. W. L. Cox, III, Section Chief, N.C. DHSR
Ms. M. Barillas, NRC Project Manager, HNP
Mr. V. M. McCree, NRC Regional Administrator, Region II

SERIAL HNP-15-025

ENCLOSURE 1

EVALUATION OF PROPOSED CHANGE

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

RENEWED LICENSE NUMBER NPF-63

Shearon Harris Nuclear Power Plant (HNP), Unit 1
Docket No. 50-400/Renewed License No. NPF-63

Evaluation of the Proposed Change
License Amendment Request to Adopt Emergency Action Level Scheme Pursuant to NEI 99- 01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors"

1.0 Summary Description

In accordance with the provisions of 10 CFR 50.90 and 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," Section IV.B, Duke Energy Progress, Inc. (Duke Energy), is proposing a change to the Shearon Harris Nuclear Power Plant (HNP), Unit 1, Emergency Plan by revising the Emergency Action Level (EAL) scheme.

Duke Energy proposes to change the EALs from a scheme based upon NEI 99-01, "Methodology for Development of Emergency Action Levels," Revision 5 (Reference 1), to one based upon NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6 (Reference 2). This change in scheme requires Nuclear Regulatory Commission (NRC) approval prior to implementation. The proposed change continues to meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR 50.

2.0 Detailed Description

HNP currently uses an emergency classification scheme based on NEI 99-01, Revision 5, as accepted by the NRC in a letter dated April 25, 2010 (Reference 3). Duke Energy requests approval to change the HNP EAL scheme basis to that described in NEI 99-01, Revision 6.

NEI 99-01, Revision 6, addresses lessons learned since the implementation of NEI 99-01, Revision 5. In February 2008, NEI published NEI 99-01, Revision 5, in order to clarify the developmental guidance of numerous EALs and to enhance the guidance associated with the development of security-related EALs. In November 2012, NEI published NEI 99-01, Revision 6. The NRC formally endorsed the NEI 99-01, Revision 6, guidance as documented in a letter dated March 28, 2013 (Reference 4) and is the most recently accepted EAL methodology endorsed by the NRC.

The HNP NEI 99-01, Revision 6, EAL Comparison Matrix (Enclosure 2) provides a line-by-line comparison between the proposed HNP Initiating Conditions (ICs), Mode Applicability, and EAL wording with those described in NEI 99-01, Revision 6. This document provides a means of assessing HNP's differences from the NRC endorsed guidance within NEI 99-01, Revision 6. No deviations from the NEI 99-01, Revision 6 are present.

Discussion of HNP EAL bases and lists of source document references are provided in the EAL Technical Bases document (Enclosures 3 and 4). The EAL Technical Bases document provides background information for use with the HNP NEI 99-01, Revision 6, EAL Comparison Matrix (Enclosure 2).

3.0 Technical Evaluation

The ICs and EALs that comprise the proposed scheme are presented in Enclosure 2. This matrix provides a cross reference between each generic IC and EAL contained in NEI 99-01, Revision 6, and the proposed HNP-specific IC and EAL.

The matrix follows the Recognition Category presentation order of NEI 99-01, Revision 6, as follows: Abnormal Rad Levels/Radiological Effluent, Cold Shutdown/Refueling System Malfunction, Fission Product Barrier Degradation, Hazards and Other Conditions Affecting Plant Safety, and System Malfunction. The Permanently Defueled Station section is not used since HNP is an operating unit. The guidance for Independent Spent Fuel Storage Installation (ISFSI) events was not used since HNP does not have an ISFSI.

Differences and Deviations

As discussed in Regulatory Issue Summary (RIS) 2003-18, Supplement 2 (Reference 5), differences and deviations are defined as follows:

- A difference is an EAL change where the basis scheme guidance 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 re-formatting 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.).

Differences and deviations were identified in accordance with the guidance discussed in RIS 2003-18 (and supplements). The proposed HNP specific ICs and EALs do not contain any deviations from the NEI 99-01, Revision 6, guidance. The basis for each difference is included in Enclosure 2. The identified differences do not alter the meaning or intent of the ICs or EALs.

Related Documents

Enclosure 3 includes the HNP EAL Technical Basis Document for each recognition category for the proposed scheme. A redline and strikeout version of the HNP EAL Technical Basis Document is provided as Enclosure 4. These documents include the applicable information from the basis information contained in NEI 99-01, Revision 6. Enclosure 5 contains the supporting calculation for HNP EAL Table R-1, "Effluent Monitor Classification Thresholds." Enclosure 6 contains the proposed HNP EAL Wallcharts.

Operational Modes and Applicability

Mode applicability of the proposed ICs and EALs is consistent with the NEI 99-01, Revision 6, basis scheme, with the exception of Mode 6. NEI 99-01, Revision 6, defines Mode 6 as one or more vessel head closure bolts less than fully tensioned. HNP Technical Specifications define Mode 6 as a state in which the reactivity condition (k_{eff}) is less than or equal to 0.95 and the average reactor coolant temperature less than or equal to 140 degrees Fahreinheit, in addition

to the condition in which fuel is in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed. The additional criteria HNP applies to Mode 6 does not adversely affect the use of the NEI 99-01, Revision 6, guidance that applies to Mode 6. The Operating Modes for HNP, as defined in the HNP Technical Specifications, are listed below.

MODE	TITLE	REACTIVITY CONDITION (k_{eff})	% RATED THERMAL POWER	Average Reactor Coolant Temperature (°F)
1	Power Operation	$\geq$ 0.99	> 5	$\geq$ 350
2	Startup	$\geq$ 0.99	$\leq$ 5	$\geq$ 350
3	Hot Standby	< 0.99	0	$\geq$ 350
4	Hot Shutdown	< 0.99	0	350 > T_{avg} > 200
5	Cold Shutdown	< 0.99	0	$\leq$ 200
6	Refueling	$\leq$ 0.95	0	$\leq$ 140

In addition to these operating modes, NEI 99-01, Revision 6, defines the "Defueled" mode, which is defined as the condition present when all reactor fuel is removed from the Reactor Vessel (full core off load during refueling or an extended outage). HNP procedures recognize, and are consistent with, this Mode definition.

State and Local Government Review of Proposed Changes

Duke Energy HNP personnel meet with the North Carolina and local emergency management agencies frequently throughout the year. Duke Energy has committed to provide a review of the new classification scheme to state and local emergency management officials following NRC approval of the requested EAL scheme revision and prior to implementation, as identified in Enclosure 7.

Implementation Description

Duke Energy plans to begin implementation of the proposed emergency classification scheme following NRC approval. Duke Energy requests approval of the proposed EAL scheme by April 30, 2016, as stated in the cover letter of this submittal. The EAL Technical Basis Document (Enclosure 3) will be revised and maintained as a training and background reference resource. Any changes to the approved ICs and EALs will be made in accordance with 10 CFR 50.54(q).

4.0 Regulatory Evaluation

4.1 Applicable Regulatory Requirements/Criteria

The regulations in 10 CFR 50.54(q) provide direction to licensees seeking to revise their Emergency Plan. The requirements related to nuclear power plant Emergency Plans are provided in the standards in 10 CFR 50.47, "Emergency Plans," and the requirements of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR 50.

Paragraph (a)(1) of 10 CFR 50.47 states in part that, "no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." Section 50.47 establishes standards that onsite and offsite emergency response plans must meet for the NRC staff to make such a positive finding. One of these standards, 10 CFR 50.47(b)(4), stipulates that Emergency Plans include a standard emergency classification and action level scheme.

10 CFR 50.47(b)(4) states, "A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures."

Section 1.8, "Conformance to NRC Regulatory Guides," of the HNP Final Safety Analysis Report (FSAR), confirms that the HNP will follow a format for emergency procedures in accordance with 10 CFR 50, Appendix E. 10 CFR 50 Appendix E, Section IV. Content of Emergency Plans, Item B, Assessment Actions states:

1. "The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant. The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and state and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis."

2. "A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. Licensees shall follow the change process in 10 CFR 50.54(q) for all other emergency action level changes."

NRC Regulatory Guide 1.101, Revision 4 (Reference 7), endorsed Nuclear Management and Resources Council, Inc./National Environmental Studies Project (NUMARC/NESP)-007,

Revision 2, issued in January 1992, and NEI 99-01, Revision 4, EAL guidance as acceptable alternatives to the guidance provided in NUREG-0654 for development of EALs to comply with 10 CFR 50.47 and Appendix E to 10 CFR Part 50. NRC RIS 2005-02, Revision 1 (Reference 6), also discusses that a change in an EAL scheme to incorporate the improvements provided in NUMARC/NESP-007 or NEI 99-01 would not decrease the overall effectiveness of the Emergency Plan. However, due to the potential safety significance of the change, the change needs prior NRC review and approval.

In a letter dated March 28, 2013 (Reference 4), the NRC staff concluded that the guidance contained in NEI 99-01, Revision 6, is an acceptable method to develop an EAL scheme in accordance with the requirements of Appendix E to 10 CFR Part 50.

4.2 Significant Hazards Consideration

Duke Energy has evaluated whether or not a significant hazards consideration (SHC) is warranted with the proposed amendment by addressing the three criterion set forth in 10 CFR 50.92(c) as discussed below:

(1) Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

These changes affect the HNP Emergency Plan and do not alter any of the requirements of the Operating License or the Technical Specifications. The proposed changes do not reduce the effecteness of the HNP Emergency Plan or the HNP Emergency Response Organization. The proposed changes do not modify any plant equipment and do not impact any failure modes that could lead to an accident. Additionally, the proposed changes do not impact the consequence of any analyzed accident since the changes do not affect any equipment related to accident mitigation. Based on this discussion, the proposed amendment does not increase the probability or consequences of an accident previously evaluated.

(2) Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

These changes affect the HNP Emergency Plan and do not alter any of the requirements of the Operating License or the Technical Specifications. These changes do not modify any plant equipment and there is no impact on the capability of the existing equipment to perform their intended functions. No system setpoints are being modified and no changes are being made to the method in which plant operations are conducted. No new failure modes are introduced by the proposed changes. The proposed amendment does not introduce accident initiator or malfunctions that would cause a new or different kind of accident. Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

(3) Does the proposed amendment involve a significant reduction in a margin of safety?

These changes affect the HNP Emergency Plan and do not alter any of the requirements of the Operating License or the Technical Specifications. The proposed changes do not affect any of the assumptions used in the accident analysis, nor do they affect any

operability requirements for equipment important to plant safety. Therefore, the proposed changes will not result in a significant reduction in the margin of safety as defined in the bases for Technical Specifications covered in this license amendment request.

Based on the above, Duke Energy concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c). Accordingly, a finding of "no significant hazards consideration" is justified.

4.3 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change in the HNP EAL Scheme, (2) operation of HNP will continue to be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 Environmental Consideration

Duke Energy has determined that the proposed amendment would not change requirements with respect to use of a facility component located within the restricted area, as defined by 10 CFR 20, nor would it change inspection or surveillance requirements. Duke Energy has evaluated the proposed change and has determined that the change does not involve:

I. A Significant Hazards Consideration,
II. A significant change in the types or significant increase in the amounts of any effluent that may be released off site, or
III. A significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs be prepared in connection with the proposed amendment.

6.0 References

1. NEI 99-01, Revision 5, *Methodology for Development of Emergency Action Levels,* dated February 2008, (Agency-wide Documents Access and Management System (ADAMS) Accession No. ML080450149)

2. NEI 99-01, Revision 6, *Development of Emergency Action Levels for Non-Passive Reactors,* dated November 2012, (ADAMS Accession Number ML12326A805)

3. Letter from Eric J. Leeds (NRC) to Christopher L. Burton (Duke Energy), *Shearon Harris Nuclear Power Plant, Unit 1 - Changes to the Emergency Action Level Scheme (TAC Nos. ME1227),* dated April 25, 2010, (ADAMS Accession Number ML100610685)

4. Letter from Mark Thaggard (NRC) to Susan Perkins-Grew (Nuclear Energy Institute), *U.S. Nuclear Regulatory Commission Review and Endorsement of NEI 99-01, Revision*

6, November 2012 (TAC NO. D92368), dated March 28, 2013, (ADAMS Accession Number ML12346A463)

5. NRC, Regulatory Issue Summary 2003-18, Supplement 2, *Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels,* dated December 12, 2005 (ADAMS Accession No. ML051450482)

6. NRC, Regulatory Issue Summary 2005-02, Revision 1, *Clarifying the Process for Making Emergency Plan Changes*, dated April 19, 2011, (ADAMS Accession Number ML100340545)

7. NRC, Regulatory Guide 1.101, Revision 4, *Emergency Planning and Preparedness for Nuclear Power Reactors*, dated July 2003 (ADAMS Accession No. ML032020276)

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ENCLOSURE 2

HARRIS NUCLEAR PLANT NEI 99-01 REVISION 6 EAL COMPARISON MATRIX

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

RENEWED LICENSE NUMBER NPF-63

Harris Nuclear Plant
NEI 99-01 Revision 6
EAL Comparison Matrix

Revision 0 [4/29/15]

Table of Contents

Introduction

This document provides a line-by-line comparison of the Initiating Conditions (ICs), Mode Applicability and Emergency Action Levels (EALs) in NEI 99-01 Rev. 6 Final, Development of Emergency Action Levels for Non-Passive Reactors, ADAMS Accession Number ML12326A805, and the Harris Nuclear Plant (HNP) ICs, Mode Applicability and EALs. This document provides a means of assessing HNP differences and deviations from the NRC endorsed guidance given in NEI 99-01. Discussion of HNP EAL bases and lists of source document references are given in the EAL Technical Bases Document. It is, therefore, advisable to reference the EAL Technical Bases Document for background information while using this document. **HNP has taken no deviation from the generic guidance.**

Comparison Matrix Format

The ICs and EALs discussed in this document are grouped according to NEI 99-01 Recognition Categories. Within each Recognition Category, the ICs and EALs are listed in tabular format according to the order in which they are given in NEI 99-01. Generally, each row of the comparison matrix provides the following information:

- NEI EAL/IC identifier
- NEI EAL/IC wording
- HNP EAL/IC identifier
- HNP EAL/IC wording
- Description of any differences or deviations

EAL Wording

In Section 4.1, NEI recommends the following: "The guidance in NEI 99-01 is not intended to be applied to plants "as-is"; however, developers should attempt to keep their site-specific schemes as close to the generic guidance as possible. The goal is to meet the intent of the generic Initiating Conditions (ICs) and Emergency Action Levels (EALs) within the context of site-specific characteristics – locale, plant design, operating features, terminology, etc. Meeting this goal will result in a shorter and less cumbersome NRC review and approval process, closer alignment with the schemes of other nuclear power plant sites and better positioning to adopt future industry-wide scheme enhancements"

EAL Emphasis Techniques

Due to the width of the table columns and table formatting constraints in this document, line breaks and indentation may differ slightly from the appearance of comparable wording in the source documents. NEI 99-01 is the source document for the NEI EALs; the HNP EAL Technical Bases Document for the HNP EALs.

The print and paragraph formatting conventions summarized below guide presentation of the HNP EALs in accordance with the EAL writing criteria. Space restrictions in the EAL table of this document sometimes override this criteria in cases when following the criteria would introduce undesirable complications in the EAL layout.

- Upper case-bold print is used for the logic terms **AND**, **OR** and **EITHER**.
- Bold font is used for certain logic terms, negative terms (**not**, **cannot**, etc.), **any**, **all**.
- Upper case print is reserved for defined terms, acronyms, system abbreviations, logic terms (and, or, etc. when not used as a conjunction), annunciator window engravings.
- Three or more items in a list are normally introduced with "**Any** of the following..." or "**All** of the following..." Items of the list begin with bullets when a priority or sequence is not inferred.
- The use of **AND/OR** logic within the same EAL has been avoided when possible. When such logic cannot be avoided, indentation and separation of subordinate contingent phrases is employed.

Global Differences

The differences listed below generally apply throughout the set of EALs and are not repeated in the Justification sections of this document. The global differences do not decrease the effectiveness of the intent of NEI 99-01.

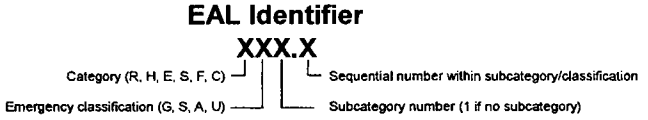
1. The NEI phrase "Notification of Unusual Event" has been changed to "Unusual Event" or abbreviated "UE" to reduce EAL-user reading burden.

2. NEI 99-01 IC Example EALs are implemented in separate plant EALs to improve clarity and readability. For example, NEI lists all IC HU3 Example EALs under one IC. The corresponding HNP EALs appear as unique EALs (e.g., HU3.1 through HU3.4).
3. Mode applicability identifiers (numbers/letter) modify the NEI 99-01 mode applicability names as follows: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown, 5 - Cold Shutdown, 6 - Refueling, D – Defueled. NEI 99-01defines Defueled as follows: "Reactor Vessel contains no irradiated fuel (full core off-load during refueling or extended outage)."
4. NEI 99-01 uses the terms greater than, less than, greater than or equal to, etc. in the wording of some example EALs. For consistency and reduce EAL-user reading burden, HNP has adopted use of boolean symbols in place of the NEI 99-01 text modifiers within the EAL wording.
5. "min." is the standard abbreviation for "minutes" and is used to reduce EAL user reading burden.
6. The term "Emergency Director" has been replaced by "Emergency Coordinator" consistent with site-specific nomenclature.
7. Wherever the generic bracketed PWR term "reactor vessel/RCS" is provided, HNP uses the term "RCS" as the site-specific nomenclature.
8. IC/EAL identification:
   - NEI Recognition Category A "Abnormal Radiation Levels/ Radiological Effluents" has been changed to Category R "Abnormal Rad Levels / Rad Effluents." The designator "R" is more intuitively associated with radiation (rad) or radiological events. NEI IC designators beginning with "A" have likewise been changed to "R."
   - NEI 99-01 defines the thresholds requiring emergency classification (example EALs) and assigns them to ICs which, in turn, are grouped in "Recognition Categories." The HNP IC/EAL scheme includes the following features:
     a. Division of the NEI EAL set into three groups:
        - EALs applicable under <u>all</u> plant operating modes – This group would be reviewed by the EAL-user any time emergency classification is considered.
        - EALs applicable only under <u>hot</u> operating modes – This group would only be reviewed by the EAL-user when the plant is in Hot Shutdown, Hot Standby, Startup or Power Operation mode.
        - EALs applicable only under <u>cold</u> operating modes – This group would only be reviewed by the EAL-user when the plant is in Cold Shutdown, Refueling or Defueled mode.

        The purpose of the groups is to avoid review of hot condition EALs when the plant is in a cold condition and avoid review of cold condition EALs when the plant is in a hot condition. This approach significantly minimizes the total number of EALs that must be reviewed by the EAL-user for a given plant condition and, thereby, speeds identification of the EAL that applies to the emergency.

     b. Within each of the above three groups, assignment of EALs to categories/subcategories – Category and subcategory titles are selected to represent conditions that are operationally significant to the EAL-user. Subcategories are used as necessary to further divide the EALs of a category into logical sets of possible emergency classification thresholds. The HNP EAL categories/subcategories and their relationship to NEI Recognition Categories are listed in Table 1.
     c. Unique identification of each EAL – Four characters comprise the EAL identifier as illustrated in Figure 1.

Figure 1 – EAL Identifier



The first character is a letter associated with the category in which the EAL is located. The second character is a letter associated with the emergency classification level (G for General Emergency, S for Site Area Emergency, A for Alert, and U for Notification of Unusual Event). The third character is a number associated with one or more subcategories within a given category. Subcategories are sequentially numbered beginning with the number "1". If a category does not have a subcategory, this character is assigned the number "1". The fourth character is a number preceded by a period for each EAL within a subcategory. EALs are sequentially numbered within the emergency classification level of a subcategory beginning with the number "1".

The EAL identifier is designed to fulfill the following objectives:

- Uniqueness – The EAL identifier ensures that there can be no confusion over which EAL is driving the need for emergency classification.
- Speed in locating the EAL of concern – When the EALs are displayed in a matrix format, knowledge of the EAL identifier alone can lead the EAL-user to the location of the EAL within the classification matrix. The identifier conveys the category, subcategory and classification level. This assists ERO responders (who may not be in the same facility as the ED) to find the EAL of concern in a timely manner without the need for a word description of the classification threshold.
- Possible classification upgrade – The category/subcategory/identifier scheme helps the EAL-user find higher emergency classification EALs that may become active if plant conditions worsen.

Table 2 lists the HNP ICs and EALs that correspond to the NEI ICs/Example EALs when the above EAL/IC organization and identification scheme is implemented.

Differences and Deviations

In accordance NRC Regulatory Issue Summary (RIS) 2003-18 "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels" Supplements 1 and 2, a difference is an EAL change in which the basis scheme guidance 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 HNP EAL. A deviation is an EAL change in which 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 HNP proposed EAL.

Administrative changes that do not actually change the textual content are neither differences nor deviations. Likewise, any format change that does not alter the wording of the IC or EAL is considered neither a difference nor a deviation.

The following are examples of differences:

- Choosing the applicable EAL based upon plant type (i.e., BWR vs. PWR).
- Using a numbering scheme other than that provided in NEI 99-01 that does not change the intent of the overall scheme.
- Where the NEI 99-01 guidance specifically provides an option to not include an EAL if equipment for the EAL does not exist at HNP (e.g., automatic real-time dose assessment capability).
- Pulling information from the bases section up to the actual EAL that does not change the intent of the EAL.
- Choosing to state ALL Operating Modes are applicable instead of stating N/A, or listing each mode individually under the Abnormal Rad Level/Radiological Effluent and Hazard and Other Conditions Affecting Plant Safety sections.

- Using synonymous wording (e.g., greater than or equal to vs. at or above, less than or equal vs. at or below, greater than or less than vs. above or below, etc.)
- Adding HNP equipment/instrument identification and/or noun names to EALs.
- Combining like ICs that are exactly the same but have different operating modes as long as the intent of each IC is maintained and the overall progression of the EAL scheme is not affected.
- Any change to the IC and/or EAL, and/or basis wording, as stated in NEI 99-01, that does not alter the intent of the IC and/or EAL, i.e., the IC and/or EAL continues to:
    - Classify at the correct classification level.
    - Logically integrate with other EALs in the EAL scheme.
    - Ensure that the resulting EAL scheme is complete (i.e., classifies all potential emergency conditions).

The following are examples of deviations:

- Use of altered mode applicability.
- Altering key words or time limits.
- Changing words of physical reference (protected area, safety-related equipment, etc.).
- Eliminating an IC. This includes the removal of an IC from the Fission Product Barrier Degradation category as this impacts the logic of Fission Product Barrier ICs.
- Changing a Fission Product Barrier from a Loss to a Potential Loss or vice-versa.
- Not using NEI 99-01definitions as the intent is for all NEI 99-01 users to have a standard set of defined terms as defined in NEI 99-01. Differences due to plant types are permissible (BWR or PWR). Verbatim compliance to the wording in NEI 99-01 is not necessary as long as the intent of the defined word is maintained. Use of the wording provided in NEI 99-01 is encouraged since the intent is for all users to have a standard set of defined terms as defined in NEI 99-01.
- Any change to the IC and/or EAL, and/or basis wording as stated in NEI 99-01 that does alter the intent of the IC and/or EAL, i.e., the IC and/or EAL:
    - Does not classify at the classification level consistent with NEI 99-01.
    - Is not logically integrated with other EALs in the EAL scheme.
    - Results in an incomplete EAL scheme (i.e., does not classify all potential emergency conditions).

The "Difference Justification" columns in the remaining sections of this document identify each difference between the NEI 99-01 IC/EAL wording and the HNP IC/EAL wording. An explanation that justifies the reason for each difference is then provided. If the difference is determined to be a deviation, a statement is made to that affect and explanation is given that states why classification may be different from the NEI 99-01 IC/EAL and the reason for its acceptability. In all cases, however, the differences and deviations do not decrease the effectiveness of the intent of NEI 99-01. HNP has identified no deviations from the NEI 99-01 guidance as represented in Table 3.

Table 1 – HNP EAL Categories/Subcategories

HNP EALs		NEI Recognition Category
Category	**Subcategory**	
Group: Any Operating Mode:		
R – Abnormal Rad Levels/Rad Effluent	1 – Radiological Effluent 2 – Irradiated Fuel Event 3 – Area Radiation Levels	Abnormal **R**ad Levels/Radiological Effluent ICs/EALs
H – Hazards and Other Conditions Affecting Plant Safety	1 – Security 2 – Seismic Event 3 – Natural or Technological Hazard 4 – Fire 5 – Hazardous Gases 6 – Control Room Evacuation 7 – Emergency Coordinator Judgment	**H**azards and Other Conditions Affecting Plant Safety ICs/EALs
N/A	N/A	ISFSI ICs/EALs
Group: Hot Conditions:		
S – System Malfunction	1 – Loss of Emergency AC Power 2 – Loss of Vital DC Power 3 – Loss of Control Room Indications 4 – RCS Activity 5 – RCS Leakage 6 – RPS Failure 7 – Loss of Communications 8 – Containment Failure 9 – Hazardous Event Affecting Safety Systems	**S**ystem Malfunction ICs/EALs
F – Fission Product Barrier	None	**F**ission Product Barrier ICs/EALs
Group: Cold Conditions:		
C – Cold Shutdown/Refueling System Malfunction	1 – RCS Level 2 – Loss of Emergency AC Power 3 – RCS Temperature 4 – Loss of Vital DC Power 5 – Loss of Communications 6 - Hazardous Event Affecting Safety Systems	**C**old Shutdown./ Refueling System Malfunction ICs/EALs

Table 2 – NEI / HNP EAL Identification Cross-Reference

NEI		HNP	
IC	**Example EAL**	**Category and Subcategory**	**EAL**
AU1	1	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RU1.1
AU1	2	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RU1.1
AU1	3	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RU1.2
AU2	1	R – Abnormal Rad Levels / Rad Effluent, 2 – Irradiated Fuel Event	RU2.1
AA1	1	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RA1.1
AA1	2	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RA1.2
AA1	3	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RA1.3
AA1	4	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RA1.4
AA2	1	R – Abnormal Rad Levels / Rad Effluent, 2 – Irradiated Fuel Event	RA2.1
AA2	2	R – Abnormal Rad Levels / Rad Effluent, 2 – Irradiated Fuel Event	RA2.2
AA2	3	R – Abnormal Rad Levels / Rad Effluent, 2 – Irradiated Fuel Event	RA2.3
AA3	1	R – Abnormal Rad Levels / Rad Effluent, 3 – Area Radiation Levels	RA3.1
AA3	2	R – Abnormal Rad Levels / Rad Effluent, 3 – Area Radiation Levels	RA3.2
AS1	1	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RS1.1
AS1	2	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RS1.2
AS1	3	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RS1.3

EAL Comparison Matrix

NEI		HNP	
IC	**Example EAL**	**Category and Subcategory**	**EAL**
AS2	1	R – Abnormal Rad Levels / Rad Effluent, 2 – Irradiated Fuel Event	RS2.1
AG1	1	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RG1.1
AG1	2	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RG1.2
AG1	3	R – Abnormal Rad Levels / Rad Effluent, 1 – Radiological Effluent	RG1.3
AG2	1	R – Abnormal Rad Levels / Rad Effluent, 2 – Irradiated Fuel Event	RG2.1
CU1	1	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CU1.1
CU1	2	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CU1.2
CU2	1	C – Cold SD/ Refueling System Malfunction, 2 – Loss of Emergency AC Power	CU2.1
CU3	1	C – Cold SD/ Refueling System Malfunction, 3 – RCS Temperature	CU3.1
CU3	2	C – Cold SD/ Refueling System Malfunction, 3 – RCS Temperature	CU3.2
CU4	1	C – Cold SD/ Refueling System Malfunction, 4 – Loss of Vital DC Power	CU4.1
CU5	1, 2, 3	C – Cold SD/ Refueling System Malfunction, 5 – Loss of Communications	CU5.1
CA1	1	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CA1.1
CA1	2	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CA1.2
CA2	1	C – Cold SD/ Refueling System Malfunction, 1 – Loss of Emergency AC Power	CA2.1
CA3	1, 2	C – Cold SD/ Refueling System Malfunction, 3 – RCS Temperature	CA3.1
CA6	1	C – Cold SD/ Refueling System Malfunction, 6 – Hazardous Event Affecting Safety Systems	CA6.1
CS1	1	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CS1.1

NEI		HNP	
IC	**Example EAL**	**Category and Subcategory**	**EAL**
CS1	2	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CS1.2
CS1	3	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CS1.3
CG1	1	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CG1.1
CG1	2	C – Cold SD/ Refueling System Malfunction, 1 – RCS Level	CG1.2
E-HU1	1	N/A	N/A
FA1	1	F – Fission Product Barrier Degradation	FA1.1
FS1	1	F – Fission Product Barrier Degradation	FS1.1
FG1	1	F – Fission Product Barrier Degradation	FG1.1
HU1	1, 2, 3	H – Hazards and Other Conditions Affecting Plant Safety, 1 – Security	HU1.1
HU2	1	H – Hazards and Other Conditions Affecting Plant Safety, 2 – Seismic Event	HU2.1
HU3	1	H – Hazards and Other Conditions Affecting Plant Safety, 3 – Natural or Technological Hazard	HU3.1
HU3	2	H – Hazards and Other Conditions Affecting Plant Safety, 3 – Natural or Technological Hazard	HU3.2
HU3	3	H – Hazards and Other Conditions Affecting Plant Safety, 3 – Natural or Technological Hazard	HU3.3
HU3	4	H – Hazards and Other Conditions Affecting Plant Safety, 3 – Natural or Technological Hazard	HU3.4
HU3	5	N/A	N/A
HU4	1	H – Hazards and Other Conditions Affecting Plant Safety, 4 – Fire	HU4.1
HU4	2	H – Hazards and Other Conditions Affecting Plant Safety, 4 – Fire	HU4.2
HU4	3	H – Hazards and Other Conditions Affecting Plant Safety, 4 – Fire	HU4.3

NEI		HNP	
IC	**Example EAL**	**Category and Subcategory**	**EAL**
HU4	4	H – Hazards and Other Conditions Affecting Plant Safety, 4 – Fire	HU4.4
HU7	1	H – Hazards and Other Conditions Affecting Plant Safety, 7 – EC udgment	HU7.1
HA1	1, 2	H – Hazards and Other Conditions Affecting Plant Safety, 1 – Security	HA1.1
HA5	1	H – Hazards and Other Conditions Affecting Plant Safety, 5 – Hazardous Gases	HA5.1
HA6	1	H – Hazards and Other Conditions Affecting Plant Safety, 6 – Control Room Evacuation	HA6.1
HA7	1	H – Hazards and Other Conditions Affecting Plant Safety, 7 – EC Judgment	HA7.1
HS1	1	H – Hazards and Other Conditions Affecting Plant Safety, 1 – Security	HS1.1
HS6	1	H – Hazards and Other Conditions Affecting Plant Safety, 6 – Control Room Evacuation	HS6.1
HS7	1	H – Hazards and Other Conditions Affecting Plant Safety, 7 – EC Judgment	HS7.1
HG1	1	H – Hazards and Other Conditions Affecting Plant Safety, 1 – Security	HG1.1
HG7	1	H – Hazards and Other Conditions Affecting Plant Safety, 7 – EC Judgment	HG7.1
SU1	1	S – System Malfunction, 1 – Loss of Emergency AC Power	SU1.1
SU2	1	S – System Malfunction, 3 – Loss of Control Room Indications	SU3.1
SU3	1	S – System Malfunction, 4 – RCS Activity	SU4.2
SU3	2	S – System Malfunction, 4 – RCS Activity	SU4.1
SU4	1, 2, 3	S – System Malfunction, 5 – RCS Leakage	SU5.1
SU5	1	S – System Malfunction, 6 – RPS Failure	SU6.1
SU5	2	S – System Malfunction, 6 – RPS Failure	SU6.2

NEI		HNP	
IC	**Example EAL**	**Category and Subcategory**	**EAL**
SU6	1, 2, 3	S – System Malfunction, 7 –Loss of Communications	SU7.1
SU7	1, 2	S – System Malfunction, 8 –Containment Failure	SU8.1
SA1	1	S – System Malfunction, 1 – Loss of Emergency AC Power	SA1.1
SA2	1	S – System Malfunction, 3 – Loss of Control Room Indications	SA3.1
SA5	1	S – System Malfunction, 6 – RPS Failure	SA6.1
SA9	1	S – System Malfunction, 9 – Hazardous Event Affecting Safety Systems	SA9.1
SS1	1	S – System Malfunction, 1 – Loss of Emergency AC Power	SS1.1
SS5	1	S – System Malfunction, 6 – RPS Failure	SS6.1
SS8	1	S – System Malfunction, 2 – Loss of Vital DC Power	SS2.1
SG1	1	S – System Malfunction, 1 – Loss of Emergency AC Power	SG1.1
SG8	1	S – System Malfunction, 1 – Loss of Emergency AC Power	SG1.2

Table 3 – Summary of Deviations

NEI		HNP EAL	Description
IC	Example EAL		
N/A	N/A	N/A	N/A

Category A

Abnormal Rad Levels / Radiological Effluent

NEI IC#	NEI IC Wording and Mode Applicability	HNP IC#(s)	HNP IC Wording and Mode Applicability	Difference Justification
AU1	Release of gaseous or liquid radioactivity greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer. MODE: All	RU1	Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer MODE: All	The HNP ODCM is the site-specific effluent release controlling document.

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Reading on **ANY** effluent radiation monitor greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer: (site-specific monitor list and threshold values corresponding to 2 times the controlling document limits)	RU1.1	Reading on **any** Table R-1 effluent radiation monitor > column "UE" for ≥ 60 min. (Notes 1, 2, 3)	Example EALs #1 and #2 have been combined into a single EAL to simplify presentation. The NEI phrase "...effluent radiation monitor greater than 2 times the (site-specific effluent release controlling document)" and "effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit " have been replaced with "...**any** Table R-1 effluent radiation monitor > column "UE". UE thresholds for all HNP continuously monitored gaseous release pathways are listed in Table R-1 to consolidate the information in a single location and, thereby, simplify identification of the thresholds by the EAL user. The values shown in Table R-1 column "UE", consistent with the NEI bases, represent two times the ODCM release limits for both liquid and gaseous release.
2	Reading on **ANY** effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.			
3	Sample analysis for a gaseous or liquid release indicates a concentration or release rate greater than 2 times the (site-specific effluent release controlling document) limits for	RU1.2	Sample analysis for a gaseous or liquid release indicates a concentration or release rate > 2 x ODCM limits for ≥ 60 min. (Notes 1, 2)	The HNP ODCM is the site-specific effluent release controlling document.

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
	60 minutes or longer.			
Notes	• The Emergency Director should declare the Unusual Event promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.
	• If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.		Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording.
	• If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.		Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes.	None

Table R-1 Effluent Monitor Classification Thresholds						
Release Point		Monitor	GE	SAE	Alert	UE
Gaseous	Plant Vent	RM-21AV-3509-1SA	1.05E+8 µCi/sec	1.05E+7 µCi/sec	1.05E+6 µCi/sec	8.93E+3 µCi/sec
Gaseous	Turbine Building	RM-1TV-3536-1	4.60E+8 µCi/sec	4.60E+7 µCi/sec	4.60E+6 µCi/sec	1.08E+4 µCi/sec
Gaseous	Waste Process Building Vent 5	RM-1WV-3546-1	7.74E+9 µCi/sec	7.74E+8 µCi/sec	7.75E+7 µCi/sec	1.95E+5 µCi/sec
Gaseous	Waste Process Building Vent 5A	RM-1WV-3547-1	7.76E+9 µCi/sec	7.76E+8 µCi/sec	7.76E+7 µCi/sec	1.14E+4 µCi/sec
Liquid	Treated Laundry & Hot Shower Tank Discharge	REM-1WL-3540	—	—	—	1.83E+5 cpm
Liquid	Waste Monitor/Waste Evaporator Condensate Tank Discharge	REM-21WL-3541	—	—	—	5.13E+5 cpm
Liquid	Secondary Waste Sample Tank Discharge	REM-21WS-3542	—	—	—	1.83E+5 cpm

NEI IC#	NEI IC Wording and Mode Applicability	HNP IC#(s)	HNP IC Wording and Mode Applicability	Difference Justification
AU2	UNPLANNED loss of water level above irradiated fuel. MODE: All	RU2	Unplanned loss of water level above irradiated fuel MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by **ANY** of the following: (site-specific level indications). **AND** b. UNPLANNED rise in area radiation levels as indicated by **ANY** of the following radiation monitors. (site-specific list of area radiation monitors)	RU2.1	UNPLANNED water level drop in the REFUELING PATHWAY as indicated by low water level alarm or indication **AND** UNPLANNED rise in corresponding area radiation levels as indicated by **any** Table R-2 area radiation monitors	The site-specific list of radiation monitors are listed in Table R-2 for ease of reading.

Table R-2 Refueling Pathway Area Radiation Monitors

Containment

- RM-1CR-3561A-SA Containment Ventilation Isolation
- RM-1CR-3561B-SB Containment Ventilation Isolation
- RM-1CR-3561C-SA Containment Ventilation Isolation
- RM-1CR-3561D-SB Containment Ventilation Isolation

Fuel Handling Building

- RM-1FR-3564A-SA Spent Fuel Pool SW, SE, SW
- RM-1FR-3564B-SB Spent Fuel Pool SW, SE, SE
- RM-1FR-3565A-SA Spent Fuel Pool SW, SE, SW
- RM-1FR-3565B-SB Spent Fuel Pool SW, SE, SE
- RM-1FR-3566A-SA Spent Fuel Pool NE, NW, NE
- RM-1FR-3566B-SB Spent Fuel Pool NW, NE, NW
- RM-1FR-3567A-SA Spent Fuel Pool NW, NE, NW
- RM-1FR-3567B-SB Spent Fuel Pool NE, NW, NE

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
AA1	Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE. MODE: All	RA1	Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site-specific monitor list and threshold values)	RA1.1	Reading on **any** Table R-1 effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4)	The HNP radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1. UE, Alert, SAE and GE thresholds for all HNP continuously monitored gaseous and liquid release pathways are listed in Table R-1 to consolidate the information in a single location and, thereby, simplify identification of the thresholds by the EAL-user.
2	Dose assessment using actual meteorology indicates doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point).	RA1.2	Dose assessment using actual meteorology indicates doses > 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4)	The site boundary is the site-specific receptor point.
3	Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point) for one hour of exposure.	RA1.3	Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2)	The site boundary is the site-specific receptor point.

4	Field survey results indicate **EITHER** of the following at or beyond (site-specific dose receptor point): • Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer. • Analyses of field survey samples indicate thyroid CDE greater than 50 mrem for one hour of inhalation.	RA1.4	Field survey results indicate **EITHER** of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 10 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate thyroid CDE > 50 mrem for 60 min. of inhalation. (Notes 1, 2)	The site boundary is the site-specific receptor point.
Notes	• The Emergency Director should declare the Alert promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. • If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. • The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded. Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit. Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes. Note 4 The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification. The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording. None Incorporated site-specific EAL numbers associated with generic EAL#1. Added the words "If dose assessment results are available, declaration should be based on dose assessment instead of

	assessments until the results from a dose assessment using actual meteorology are available.		assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values.	radiation monitor values." to reinforce the intent of the note.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
AA2	Significant lowering of water level above, or damage to, irradiated fuel. MODE: All	RA2	Significant lowering of water level above, or damage to, irradiated fuel MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Uncovery of irradiated fuel in the REFUELING PATHWAY.	RA2.1	Uncovery of irradiated fuel in the REFUELING PATHWAY	None
2	Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** of the following radiation monitors: (site-specific listing of radiation monitors, and the associated readings, setpoints and/or alarms)	RA2.2	Damage to irradiated fuel resulting in a release of radioactivity **AND** A high alarm on **any** of the following: • Table R-2 refueling pathway area radiation monitors • REM-*1FL-3508A-SA, FHB Emergency Exhaust • REM-*1FL-3508B-SB, FHB Emergency Exhaust	The NEI phrase "...from the fuel as indicated by ANY of the following radiation monitors" has been replaced with "...AND A high alarm on any of the following" for clarification that the classification requires two conditions: damage to fuel and a resultant high radiation alarm. The site-specific list of radiation monitors are listed in bullet format for ease of reading. The high setpoints for the radiation monitors are indicative of significant increases in area and/or airborne radiation.
3	Lowering of spent fuel pool level to (site-specific Level 2 value). [*See Developer Notes*]	RA2.3	Lowering of spent fuel pool level ≤ 270.7 ft. (Level 2)	Post-Fukushima order EA-12-051 required the installation of reliable SFP level indication capable of identifying normal level (Level 1), SFP level 10 ft. above the top of the fuel racks (Level 2) and SFP level at the top of the fuel racks (Level 3). The SFP level instruments consist of a three independent remote indicating channels (LI-5101A, LI-5102A and LI-5103A) each spanning approximately 25 ft. (260 ft. – 285 ft. indicated). Level 2 corresponds to an indicated SFP level of 270.7 ft. or approximately 10 ft. above the top of the SFP

				racks.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
AA3	Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown MODE: All	RA3	Radiation levels that IMPEDE access to equipment necessary for normal plant operations, cooldown or shutdown MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Dose rate greater than 15 mR/hr in **ANY** of the following areas: • Control Room • Central Alarm Station • (other site-specific areas/rooms)	RA3.1	Dose rate > 15 mR/hr in **EITHER** of the following areas: Control Room (RM-21RR-3560-SA) **OR** Central Alarm Station (by survey)	No other site-specific areas requiring continuous occupancy exist at HNP. RM-21RR-3560-SA monitors the Control room for area radiation. The CAS does not have installed area radiation monitoring and thus must be determined by survey.
2	An UNPLANNED event results in radiation levels that prohibit or impede access to any of the following plant rooms or areas: (site-specific list of plant rooms or areas with entry-related mode applicability identified)	RA3.2	An UNPLANNED event results in radiation levels that prohibit or impede access to any Table R-3/H-2 rooms or areas (Note 5)	Table R-3/H-2 contains the site-specific list of plant rooms or areas with entry-related mode applicability identified.
Note	If the equipment in the listed room or area was already inoperable or out-of-service before the event occurred, then no emergency classification is warranted.	Note 5	If the equipment in the listed room or area was already inoperable or out-of-service before the event occurred, then **no** emergency classification is warranted.	None

Table R-3/H-2 Safe Operation & Shutdown Rooms/Areas	
Room/Area	**Mode(s)**
RAB 190 (RHR pumps)	4
RAB 216 (BIT)	1, 2, 3, 4, 5
RAB 236 (CSIP, Primary Sample Sink, AFW pumps, CCW pumps and HX, Boric Acid Transfer Pumps, Mezzanine Area)	1, 2, 3, 4, 5
RAB 261 (RHR Heat Exchangers, Demin. Valve Gallery, VCT Valve Gallery)	1, 2, 3, 4, 5
RAB 286 (Switchgear)	3,4,5
Containment Building	3
Steam Tunnel	1, 2, 3, 4
ESW intakes	1, 2, 3, 4, 5

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
AS1	Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE MODE: All MODE: All	RS1	Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site-specific monitor list and threshold values)	RS1.1	Reading on **any** Table R-1 effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4)	The HNP radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1. UE, Alert, SAE and GE thresholds for all HNP continuously monitored gaseous and liquid release pathways are listed in Table R-1 to consolidate the information in a single location and, thereby, simplify identification of the thresholds by the EAL-user.
2	Dose assessment using actual meteorology indicates doses greater than 100 mrem TEDE or 500 mrem thyroid CDE at or beyond (site-specific dose receptor point)	RS1.2	Dose assessment using actual meteorology indicates doses > 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4)	The site boundary is the site-specific receptor point.
3	Field survey results indicate **EITHER** of the following at or beyond (site-specific dose receptor point): • Closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer. • Analyses of field survey samples indicate thyroid	RS1.3	Field survey results indicate **EITHER** of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate thyroid CDE > 500 mrem for 60 min. of	The site boundary is the site-specific receptor point.

	CDE greater than 500 mrem for one hour of inhalation.		inhalation. (Notes 1, 2)	
Notes	• The Emergency Director should declare the Site Area Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. • If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. • The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.		Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded. Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit. Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is no longer VALID for classification purposes. Note 4 The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification. The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording. None Incorporated site-specific EAL numbers associated with generic EAL#1. Added the words "If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values." to reinforce the intent of the note.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
AS2	Spent fuel pool level at (site-specific Level 3 description) MODE: All	RS2	Spent fuel pool level at the top of the fuel racks	Top of the fuel racks is the site-specific Level 3 description.

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Lowering of spent fuel pool level to (site-specific Level 3 value)	RS2.1	Lowering of spent fuel pool level ≤ 260.7 ft. (Level 3)	Post-Fukushima order EA-12-051 required the installation of reliable SFP level indication capable of identifying normal level (Level 1), SFP level 10 ft. above the top of the fuel racks (Level 2) and SFP level at the top of the fuel racks (Level 3). The SFP level instruments consist of a three independent remote indicating channels (LI-5101A, LI-5102A and LI-5103A) each spanning approximately 25 ft. (260 ft. – 285 ft. indicated). Level 3 corresponds to an indicated SFP level of 260.7 ft. which is the top of the SFP racks.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
AG1	Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE. MODE: All	RG1	Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site-specific monitor list and threshold values)	RG1.1	Reading on **any** Table R-1 effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4)	The HNP radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1. UE, Alert, SAE and GE thresholds for all HNP continuously monitored gaseous or liquid release pathways are listed in Table R-1 to consolidate the information in a single location and, thereby, simplify identification of the thresholds by the EAL-user.
2	Dose assessment using actual meteorology indicates doses greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE at or beyond (site-specific dose receptor point).	RG1.2	Dose assessment using actual meteorology indicates doses > 1,000 mrem TEDE or 5,000 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4)	The site boundary is the site-specific receptor point.
3	Field survey results indicate **EITHER** of the following at or beyond (site-specific dose receptor point): • Closed window dose rates greater than 1,000 mR/hr expected to continue for 60 minutes or longer. • Analyses of field survey samples indicate thyroid CDE greater than 5,000 mrem for	RG1.3	Field survey results indicate **EITHER** of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 1,000 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate thyroid CDE > 5,000 mrem for 60 min. of inhalation.	The site boundary is the site-specific receptor point.

	one hour of inhalation.		(Notes 1, 2)	
Notes	• The Emergency Director should declare the Site Area Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. • If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. • The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.		Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded. Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit. Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is no longer VALID for classification purposes. Note 4 The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification. The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording. None Incorporated site-specific EAL numbers associated with generic EAL#1. Added the words "If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values." to reinforce the intent of the note.

			should be based on dose assessment instead of radiation monitor values.	

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
AG2	Spent fuel pool level cannot be restored to at least (site-specific Level 3 description) for 60 minutes or longer MODE: All	RG2	Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer	Top of the fuel racks is the site-specific Level 3 description.

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Spent fuel pool level cannot be restored to at least (site-specific Level 3 value) for 60 minutes or longer	RG2.1	Spent fuel pool level cannot be restored to at least 260.7 ft. (Level 3) for ≥ 60 min. (Note 1)	Post-Fukushima order EA-12-051 required the installation of reliable SFP level indication capable of identifying normal level (Level 1), SFP level 10 ft. above the top of the fuel racks (Level 2) and SFP level at the top of the fuel racks (Level 3). The SFP level instruments consist of a three independent remote indicating channels (LI-5101A, LI-5102A and LI-5103A) each spanning approximately 25 ft. (260 ft. – 285 ft. indicated). Level 3 corresponds to an indicated SFP level of 260.7 ft. which is the top of the SFP racks.
Note	The Emergency Director should declare the General Emergency promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

Category C

Cold Shutdown / Refueling System Malfunction

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CU1	UNPLANNED loss of (reactor vessel/RCS [*PWR*] or RCP [*BWR*]) inventory for 15 minutes or longer. MODE: Cold Shutdown, Refueling	CU1	UNPLANNED loss of RCS inventory for 15 minutes or longer MODE: 5 - Cold Shutdown, 6 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	UNPLANNED loss of reactor coolant results in (reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level less than a required lower limit for 15 minutes or longer.	CU1.1	UNPLANNED loss of reactor coolant results in RCS water level less than a required lower limit for ≥ 15 min. (Note 1)	None
2	a. (Reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level cannot be monitored. **AND** b. UNPLANNED increase in (site-specific sump and/or tank) levels.	CU1.2	RCS water level cannot be monitored **AND EITHER** • UNPLANNED increase in **any** Table C-1 sump or tank due to a loss of RCS inventory • Visual observation of UNISOLABLE RCS leakage	Added the phrase "due to a loss of RCS inventory" because the NEI basis states: "Sump and/or tank level changes must be evaluated against other potential sources of water flow to ensure they are indicative of leakage from the RCS." Table C-1 lists site-specific applicable sumps and tanks. Added bulleted criteria "Visual observation of UNISOLABLE RCS leakage" to include direct observation of RCS leakage.
Note	The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

			exceeded, or will likely be exceeded.	

Table C-1 Sumps / Tanks
• Containment sumps • PRT • RCDT • CCW surge tank • RAB sumps • RWST • RMWST • Recycle Holdup Tank

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CU2	Loss of all but one AC power source to emergency buses for 15 minutes or longer. MODE: Cold Shutdown, Refueling, Defueled	CU2	Loss of **all but one** AC power source to emergency buses for 15 minutes or longer. MODE: 6 - Cold Shutdown, 6 - Refueling, D - Defueled	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. AC power capability to (site-specific emergency buses) is reduced to a single power source for 15 minutes or longer. **AND** b. Any additional single power source failure will result in loss of all AC power to SAFETY SYSTEMS.	CU2.1	AC power capability to emergency 6.9 KV buses 1A-SA and 1B-SB reduced to a single power source for ≥ 15 min. (Note 1) **AND** **Any** additional single power source failure will result in loss of **all** AC power to SAFETY SYSTEMS	6.9 KV buses 1A-SA and 1B-SB are the site-specific emergency buses.
Note	The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CU3	UNPLANNED increase in RCS temperature MODE: Cold Shutdown, Refueling	CU3	UNPLANNED increase in RCS temperature MODE: Cold Shutdown, 6 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	UNPLANNED increase in RCS temperature to greater than (site-specific Technical Specification cold shutdown temperature limit)	CU3.1	UNPLANNED increase in RCS temperature to > 200°F due to loss of decay heat removal capability	200°F is the site-specific Tech. Spec. cold shutdown temperature limit. Added "due to loss of decay heat removal capability" to reinforce the generic bases that states "EAL #1 involves a loss of decay heat removal capability"
2	Loss of **ALL** RCS temperature and (reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level indication for 15 minutes or longer.	CU3.2	Loss of **all** RCS temperature and RCS level indication for ≥ 15 min. (Note 1)	None
Note	The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CU4	Loss of Vital DC power for 15 minutes or longer. MODE: Cold Shutdown, Refueling	CU4	Loss of Vital DC power for 15 minutes or longer. MODE: 5 - Cold Shutdown, 6 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Indicated voltage is less than (site-specific bus voltage value) on required Vital DC buses for 15 minutes or longer.	CU4.1	< 105 VDC bus voltage indications on Technical Specification **required** 125 VDC buses (DP-1A-SA, DP-1B-SB) for ≥ 15 min. (Note 1)	105 VDC is the site-specific minimum vital DC bus voltage. DC operability requirements are specified in Technical Specifications.
Note	The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CU5	Loss of all onsite or offsite communications capabilities. MODE: Cold Shutdown, Refueling, Defueled	CU5	Loss of **all** onsite or offsite communications capabilities. MODE: Cold Shutdown, 6 - Refueling, D - Defueled	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Loss of **ALL** of the following onsite communication methods: (site specific list of communications methods)	CU5.1	Loss of **all** Table C-4 onsite communication methods **OR** Loss of **all** Table C-4 ORO communication methods **OR** Loss of **all** Table C-4 NRC communication methods	Example EALs #1, 2 and 3 have been combined into a single EAL for simplification of presentation. Table C-4 provides a site-specific list of onsite, ORO and NRC communications methods.
2	Loss of **ALL** of the following ORO communications methods: (site specific list of communications methods)			
3	Loss of **ALL** of the following NRC communications methods: (site specific list of communications methods)			

Table C-4 Communication Methods			
System	**Onsite**	**ORO**	**NRC**
PABX telephone (desk phones)	X	X	X
HE&EC PABX telephone		X	X
Site paging system	X		
Satellite phone		X	X
DEMNET		X	
Radio communications networks	X		
NRC ETS phone			X
NRC HPN phone			X

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CA1	Loss of (reactor vessel/RCS [*PWR*] or RCP [*BWR*]) inventory MODE: Cold Shutdown, Refueling	CA1	Loss of RCS inventory MODE: Cold Shutdown, 6 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Loss of (reactor vessel/RCS [*PWR*] or RCP [*BWR*]) inventory as indicated by level less than (site-specific level).	CA1.1	Loss of RCS inventory as indicated by LI-403 or RCS standpipe level < - 82 in.	LI-403 or RCS standpipe level of - 82" corresponds to the minimum RCS level for continued RHR pump operation.
2	a. (Reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level cannot be monitored for 15 minutes or longer **AND** b. UNPLANNED increase in (site-specific sump and/or tank) levels due to a loss of (reactor vessel/RCS [*PWR*] or RCP [*BWR*]) inventory.	CA1.2	RCS water level cannot be monitored for ≥ 15 min. (Note 1) **AND EITHER** • UNPLANNED increase in **any** Table C-1 sump or tank due to a loss of RCS inventory • Visual observation of UNISOLABLE RCS leakage	Added the phrase "due to a loss of RCS inventory" because the NEI basis states: "Sump and/or tank level changes must be evaluated against other potential sources of water flow to ensure they are indicative of leakage from the RCS." Table C-1 lists site-specific applicable sumps and tanks. Added bulleted criteria "Visual observation of UNISOLABLE RCS leakage" to include direct observation of RCS leakage.
Note	The Emergency Director should declare the Alert promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CA2	Loss of all offsite and all onsite AC power to emergency buses for 15 minutes or longer MODE: Cold Shutdown, Refueling, Defueled	CA2	Loss of **all** offsite and **all** onsite AC power to emergency buses for 15 minutes or longer. MODE: Cold Shutdown, 6 - Refueling, D - Defueled	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Loss of **ALL** offsite and **ALL** onsite AC Power to (site-specific emergency buses) for 15 minutes or longer.	CA2.1	Loss of **all** offsite and **all** onsite AC power capability to 6.9 KV emergency buses 1A-SA and 1B-SB for ≥ 15 min. (Note 1)	6.9 KV buses 1A-SA and 1B-SB are the site-specific emergency buses.
Note	The Emergency Director should declare the Alert promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CA3	Inability to maintain the plant in cold shutdown. MODE: Cold Shutdown, Refueling	CA3	Inability to maintain the plant in cold shutdown. MODE: Cold Shutdown, 6 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	UNPLANNED increase in RCS temperature to greater than (site-specific Technical Specification cold shutdown temperature limit) for greater than the duration specified in the following table.	CA3.1	UNPLANNED increase in RCS temperature to > 200°F for > Table C-3 duration (Note 1) **OR** UNPLANNED RCS pressure increase > 10 psig due to a loss of RCS cooling (this does **not** apply during water-solid plant conditions)	Example EALs #1 and #2 have been combined into a single EAL as EAL # is the alternative threshold based on a loss of RCS temperature indication. 200°F is the site-specific Tech. Spec. cold shutdown temperature limit. Table C-3 is the site-specific implementation of the generic RCS Heat-up Duration Threshold table. 10 psig is the site-specific pressure increase readable by Control Room indications.
2	UNPLANNED RCS pressure increase greater than (site-specific pressure reading). (This EAL does not apply during water-solid plant conditions. [*PWR*])			
Note	The Emergency Director should declare the Alert promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

Table: RCS Heat-up Duration Thresholds		
RCS Status	**Containment Closure Status**	**Heat-up Duration**
Intact (but not at reduced inventory [*PWR*])	Not applicable	60 minutes*
Not intact (or at reduced inventory [*PWR*])	Established	20 minutes*
	Not Established	0 minutes
* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, the EAL is not applicable.		

Table C-3: RCS Heat-up Duration Thresholds		
RCS Status	**Containment Closure Status**	**Heat-up Duration**
Intact (but **not** REDUCED INVENTORY)	N/A	60 min.*
Not intact **OR** At REDUCED INVENTORY	established	20 min.*
	not established	0 min.
* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, the EAL is **not** applicable.		

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CA6	Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode. MODE: Cold Shutdown, Refueling	CA6	Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode. MODE: Cold Shutdown, 6 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. The occurrence of **ANY** of the following hazardous events: • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • (site-specific hazards) • Other events with similar hazard characteristics as determined by the Shift Manager **AND** b. **EITHER** of the following: 1. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode. **OR** 2. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode.	CA6.1	The occurrence of **any** Table C-5 hazardous event **AND EITHER**: • Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode • The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode	The hazardous events have been tabularized in Table C-5.

Table C-5 Hazardous Events
• Seismic event (earthquake) • Internal or external FLOODING event • High winds or tornado strike • FIRE • EXPLOSION • Other events with similar hazard characteristics as determined by the Shift Manager

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CS1	Loss of (reactor vessel/RCS [*PWR*] or RCP [*BWR*]) inventory affecting core decay heat removal capability. MODE: Cold Shutdown, Refueling	CS1	Loss of RCS inventory affecting core decay heat removal capability MODE: Cold Shutdown, 6 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. CONTAINMENT CLOSURE not established. **AND** b. (Reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level less than (site-specific level).	CS1.1	With CONTAINMENT CLOSURE **not** established, RCS level < 70% RVLIS Full Range	70% RVLIS Full Range corresponds to the level of six inches below the bottom ID of the RCS hot leg penetration (252.04' el.). 6% has been added to the RVLIS setpoint to account for instrument uncertainties.
2	a. CONTAINMENT CLOSURE established. **AND** b. (Reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level less than (site-specific level).	CS1.2	With CONTAINMENT CLOSURE established, RCS level < 63% RVLIS Full Range	63% RVLIS Full Range corresponds to the top of active fuel (249.01' el.). Other RCS level instruments are off-scale low when core uncovery occurs. 6% has been added to the RVLIS setpoint to account for instrument uncertainties.
3	a. (Reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level cannot be monitored for 30 minutes or longer. **AND** b. Core uncovery is indicated by **ANY** of the following:	CS1.3	RCS water level cannot be monitored for ≥ 30 min. (Note 1) **AND** Core uncovery is indicated by **any** of the following: • UNPLANNED increase in **any** Table C-1 sump or tank due to a loss of RCS	Added bulleted criteria "Visual observation of UNISOLABLE RCS leakage" to include direct observation of RCS leakage. Table C-1 lists site-specific applicable sumps and tanks. The dose rate due to this core shine should result in indications on installed area radiation monitors (RM-1CR-3589-SA or RM-1CR-3590-SB). If these radiation monitors reach and exceed 10,000 R/hr, a loss of inventory with potential to uncover the core is likely to have

	• (Site-specific radiation monitor) reading greater than (site-specific value) • Erratic source range monitor indication [*PWR*] • UNPLANNED increase in (site-specific sump and/or tank) levels of sufficient magnitude to indicate core uncovery • (Other site-specific indications)		inventory • Visual observation of unisolable RCS leakage • Containment radiation > 10,000 R/hr (RM-1CR-3589-SA or RM-1CR-3590-SB) • Erratic source range monitor indication	occurred.
Note	The Emergency Director should declare the Site Area Emergency promptly upon determining that 30 minutes has been exceeded, or will likely be exceeded	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
CG1	Loss of (reactor vessel/RCS [*PWR*] or RCP [*BWR*]) inventory affecting fuel clad integrity with containment challenged MODE: Cold Shutdown, Refueling	CG1	Loss of RCS inventory affecting fuel clad integrity with containment challenged MODE: Cold Shutdown, 6 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. (Reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level less than (site-specific level) for 30 minutes or longer. **AND** b. **ANY** indication from the Containment Challenge Table (see below).	CG1.1	RCS level < 63% RVLIS Full Range for ≥ 30 min. (Note 1) **AND** **Any** Containment Challenge indication, Table C-2	63% RVLIS Full Range corresponds to the top of active fuel (249.01' el.). Other RCS level instruments are off-scale low when core uncovery occurs. 6% has been added to the RVLIS setpoint to account for instrument uncertainties. Table C-2 provides a tabularized list of containment challenge indications. 4% hydrogen concentration in the presence of oxygen represents an explosive mixture in containment.
2	a. (Reactor vessel/RCS [*PWR*] or RCP [*BWR*]) level cannot be monitored for 30 minutes or longer. **AND** b. Core uncovery is indicated by **ANY** of the following: • (Site-specific radiation monitor) reading greater than (site-specific value) • Erratic source range monitor indication [*PWR*]	CG1.2	RCS water level cannot be monitored for ≥ 30 min. (Note 1) **AND** Core uncovery is indicated by **any** of the following: • UNPLANNED increase in **any** Table C-1 sump or tank due to a loss of RCS inventory • Visual observation of UNISOLABLE RCS leakage • Containment radiation >	Added bulleted criteria "Visual observation of UNISOLABLE RCS leakage" to include direct observation of RCS leakage. The dose rate due to this core shine should result in indications on installed area radiation monitors (RM-1CR-3589-SA or RM-1CR-3590-SB). If these radiation monitors reach and exceed 10,000 R/hr, a loss of inventory with potential to uncover the core is likely to have occurred. Table C-1 lists site-specific applicable sumps and tanks. Table C-2 provides a tabularized list of containment challenge indications. 4% hydrogen concentration in the presence of oxygen represents an explosive mixture in containment.

	• UNPLANNED increase in (site-specific sump and/or tank) levels of sufficient magnitude to indicate core uncovery • (Other site-specific indications) **AND** c. **ANY** indication from the Containment Challenge Table (see below).		10,000 R/hr (RM-1CR-3589-SA or RM-1CR-3590-SB) • Erratic source range monitor indication **AND** **Any** Containment Challenge indication, Table C-2	
Note	The Emergency Director should declare the General Emergency promptly upon determining that 30 minutes has been exceeded, or will likely be exceeded. N/A	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded. Note 6: If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, declaration of a General Emergency is **not** required.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification. Note 6 implements the asterisked note associated with the generic Containment Challenge table.

Containment Challenge Table
■ CONTAINMENT CLOSURE not established*
■ (Explosive mixture) exists inside containment
■ UNPLANNED increase in containment pressure
■ Secondary containment radiation monitor reading above (site-specific value) [*BWR*]

* If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, then declaration of a General Emergency is not required.

Table C-2 Containment Challenge Indications
• CONTAINMENT CLOSURE **not** established (Note 6) • Containment hydrogen concentration ≥ 4% • UNPLANNED rise in Containment pressure

Category D

Permanently Defueled Station Malfunction

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
PD-AU1 PD-AU2 PD-SU1 PD-HU1 PD-HU2 PD-HU3 PD-AA1 PD-AA2 PD-HA1 PD-HA3	Recognition Category D Permanently Defueled Station	N/A	N/A	NEI Recognition Category PD ICs and EALs are applicable only to permanently defueled stations. HNP is not a defueled station.

Category E

Independent Spent Fuel Storage Installation

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
E-HU1	Damage to a loaded cask CONFINEMENT BOUNDARY MODE: All	N/A	N/A	HNP does not have an ISFSI.

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than (2 times the site-specific cask specific technical specification allowable radiation level) on the surface of the spent fuel cask.	N/A	N/A	HNP does not have an ISFSI.

Category F

Fission Product Barrier Degradation

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
FA1	Any Loss or any Potential Loss of either the Fuel Clad or RCS barrier. MODE: Power Operation, Hot Standby, Startup, Hot Shutdown	FA1	**Any** loss or **any** potential loss of either Fuel Clad or RCS MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Any Loss or any Potential Loss of either the Fuel Clad or RCS barrier.	FA1.1	**Any** loss or **any** potential loss of either Fuel Clad or RCS (Table F-1)	Table F-1 provides the fission product barrier loss and potential loss thresholds.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
FS1	Loss or Potential Loss of any two barriers MODE: Power Operation, Hot Standby, Startup, Hot Shutdown	FS1	Loss or potential loss of **any** two barriers MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Loss or Potential Loss of any two barriers	FS1.1	Loss or potential loss of **any** two barriers	Table F-1 provides the fission product barrier loss and potential loss thresholds.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
FG1	Loss of any two barriers and Loss or Potential Loss of third barrier MODE: Power Operation, Hot Standby, Startup, Hot Shutdown	FG1	Loss of **any** two barriers and loss or potential loss of the third barrier MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Loss of any two barriers and Loss or Potential Loss of third barrier	FG1.1	Loss of **any** two barriers **AND** Loss or potential loss of the third barrier (Table F-1)	Table F-1 provides the fission product barrier loss and potential loss thresholds.

PWR Fuel Clad Fission Product Barrier Degradation Thresholds

NEI FPB#	NEI Threshold Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
FC Loss 1	**RCS or SG Tube Leakage** Not Applicable	N/A	N/A	N/A
FC Loss 2	**Inadequate Heat Removal** A. Core exit thermocouple readings greater than (site-specific temperature value).	FC Loss B.1	CSFST Core Cooling-RED Path entry conditions met	Consistent with the generic developers note options CSFST Core Cooling Red Path is used in lieu of CET temperatures.
FC Loss 3	**RCS Activity/CMNT Rad** A. Containment radiation monitor reading greater than (site-specific value) **OR** B. (Site-specific indications that reactor coolant activity is greater than 300 µCi/gm dose equivalent I-131)	FC Loss C.1	Containment radiation >150 R/hr (RM-1CR-3589-SA or RM-1CR-3590-SB)	Containment radiation monitor readings greater than 150.3 R/hr, rounded to 150 R/hr for readability, indicate the release of reactor coolant, with elevated activity indicative of fuel damage, into the Containment. The reading is derived assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 µCi/cc dose equivalent I-131 into the Containment atmosphere.
		FC Loss C.2	Dose equivalent I-131 coolant activity > 300 µCi/gm	None
FC Loss 4	**CNMT Integrity or Bypass** Not Applicable	N/A	N/A	N/A
FC Loss 5	**Other Indications** A. (site-specific as applicable)	N/A	N/A	No other site-specific Fuel Clad Loss indication has been identified for HNP.

NEI FPB#	NEI Threshold Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
FC Loss 6	**ED Judgment** A. **ANY** condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier.	FC Loss E.1	**Any** condition in the opinion of the Emergency Coordinator that indicates loss of the fuel clad barrier	None
FC P-Loss 1	**RCS or SG Tube Leakage** A. RCS/reactor vessel level less than (site-specific level)	N/A	N/A	See FC P-Loss B.1. The RCS level threshold is implemented as CSFST Core Cooling Orange Path conditions met.
FC P-Loss 2	**Inadequate Heat Removal** A. Core exit thermocouple readings greater than (site-specific temperature value) **OR** B. Inadequate RCS heat removal capability via steam generators as indicated by (site-specific indications).	FC P-Loss B.1	CSFST Core Cooling-ORANGE Path entry conditions met	Consistent with the generic developers note options CSFST Core Cooling Orange Path is used in lieu of CET temperatures.
		FC P-Loss B.2	CSFST Heat Sink-RED Path entry conditions met **AND** Heat sink is required	Consistent with the generic developers note options CSFST Heat Sink Red Path is used. The phrase "and heat sink required" was added to preclude the need for classification for conditions in which RCS pressure is less than SG pressure or Heat Sink-RED path entry was created through operator action directed by an EOP.
FC P-Loss 3	**RCS Activity/CMNT Rad** Not Applicable	N/A	N/A	N/A
FC P-Loss 4	**CNMT Integrity or Bypass** Not Applicable	N/A	N/A	N/A
FC P-Loss 5	**Other Indications** A. (site-specific as applicable)	N/A	N/A	No other site-specific Fuel Clad Potential Loss indication has been identified for HNP.

NEI FPB#	NEI Threshold Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
FC P-Loss 6	**Emergency Director Judgment** A. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.	FC P-Loss E.1	**Any** condition in the opinion of the Emergency Coordinator that indicates potential loss of the fuel clad barrier	None

PWR RCS Fission Product Barrier Degradation Thresholds

NEI FPB#	NEI IC Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
RCS Loss 1	**RCS or SG Tube Leakage** A. An automatic or manual ECCS (SI) actuation is required by **EITHER** of the following: 1. UNISOLABLE RCS leakage **OR** 2. SG tube RUPTURE.	RCS Loss A.1	An automatic or manual ECCS (SI) actuation required by **EITHER:** • UNISOLABLE RCS leakage • SG tube RUPTURE	None
RCS Loss 2	**Inadequate Heat Removal** Not Applicable	N/A	N/A	N/A
RCS Loss 3	**RCS Activity/CMNT Rad** A. Containment radiation monitor reading greater than (site-specific value).	RCS Loss C.1	Containment Leak Detection Monitor Noble Gas (REM-1LT-3502A-SA) > 8.3E-3 µCi/ml	Containment radiation monitor readings on REM-1LT-3502A-SA noble gas channel greater than 8.3E-3 µCi/ml indicate the release of reactor coolant to the Containment. The readings assume 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.
RCS Loss 4	**CNMT Integrity or Bypass** Not Applicable	N/A	N/A	N/A
RCS Loss 5	**Other Indications** A. (site-specific as applicable)	N/A	N/A	No other site-specific RCS Loss indication has been identified for HNP.

NEI FPB#	NEI IC Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
RCS Loss 6	**Emergency Director Judgment** A. **ANY** condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.	RCS Loss E.1	**Any** condition in the opinion of the Emergency Coordinator that indicates loss of the RCS barrier	None
RCS P-Loss 1	**RCS or SG Tube Leakage** A. Operation of a standby charging (makeup) pump is required by **EITHER** of the following: 1. UNISOLABLE RCS leakage **OR** 2. SG tube leakage. **OR** B. RCS cooldown rate greater than (site-specific pressurized thermal shock criteria/limits defined by site-specific indications).	RCS P-Loss A.1	RCS leakage > normal makeup capacity (> 120 gpm) due to **EITHER:** • UNISOLABLE RCS leakage • SG tube leakage	HNP makeup capacity is not limited by charging pump capacity but by makeup line flow capacity. Normal maximum makeup flow with letdown isolated is ~120 gpm.
		RCS P-Loss A.2	CSFST Integrity-RED Path entry conditions met	Consistent with the generic developers note options CSFST Integrity Red Path is used.
RCS P-Loss 2	**Inadequate Heat Removal** A. Inadequate RCS heat removal capability via steam generators as indicated by (site-specific indications).	RCS P-Loss B.1	CSFST Heat Sink-RED Path conditions met **AND** Heat sink is required	Consistent with the generic developers note options CSFST Heat Sink Red Path is used. The phrase "and heat sink required" was added to preclude the need for classification for conditions in which RCS pressure is less than SG pressure or Heat Sink-RED path entry was created through operator action directed by an EOP.
RCS P-Loss 3	**CS Activity/CMNT Rad** Not Applicable	N/A	N/A	N/A

NEI FPB#	NEI IC Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
RCS P-Loss 4	**CNMT Integrity or Bypass** Not Applicable	N/A	N/A	N/A
RCS P-Loss 5	**Other Indications** A. (site-specific as applicable)	N/A	N/A	No other site-specific RCS Potential Loss indication has been identified for HNP.
RCS P-Loss 6	**Emergency Director Judgment** A. **ANY** condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.	RCS P-Loss E.1	**Any** condition in the opinion of the Emergency Coordinator that indicates potential loss of the RCS barrier	None

PWR Containment Fission Product Barrier Degradation Thresholds

NEI FPB#	NEI IC Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
CNMT Loss 1	**RCS or SG Tube Leakage** A. A leaking or RUPTURED SG is FAULTED outside of containment.	CNMT Loss A.1	A leaking or RUPTURED SG is FAULTED outside of containment	None
CNMT Loss 2	**Inadequate Heat Removal** Not Applicable	N/A	N/A	N/A
CNMT Loss 3	**RCS Activity/CMNT Rad** Not applicable	N/A	N/A	N/A
CNMT Loss 4	**CNMT Integrity or Bypass** A. Containment isolation is required **AND** **EITHER** of the following: 1. Containment integrity has been lost based on Emergency Director judgment. **OR** 2. UNISOLABLE pathway from the containment to the environment exists. **OR** B. Indications of RCS leakage outside of containment.	CNMT Loss D.1	Containment isolation is required **AND EITHER:** • Containment integrity has been lost based on Emergency Coordinator judgment • UNISOLABLE pathway from containment to the environment exists	None
		CNMT Loss D.2	Indications of RCS leakage outside of containment	None

NEI FPB#	NEI IC Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
CNMT Loss 5	**Other Indications** A. (site-specific as applicable)	N/A	N/A	No other site-specific Containment Loss indication has been identified for HNP.
CNMT Loss 6	**Emergency Director Judgment** **ANY** condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.	CNMT Loss E.1	**Any** condition in the opinion of the Emergency Coordinator that indicates loss of the containment barrier	None
CNMT P-Loss 1	**RCS or SG Tube Leakage** Not Applicable	N/A	N/A	N/A
CNMT P-Loss 2	**Inadequate Heat Removal** A. 1. (Site-specific criteria for entry into core cooling restoration procedure) **AND** 2. Restoration procedure not effective within 15 minutes.	CNMT P-Loss B.1	CSFST Core Cooling-RED Path entry conditions met **AND** Restoration procedures **not** effective within 15 min. (Note 1)	Consistent with the generic developers note options CSFST Core Cooling Red Path is used in lieu of CET temperatures and RCS levels. Added Note 1 consistent with other thresholds with a timing component.
CNMT P-Loss 3	**RCS Activity/CMNT Rad** A. Containment radiation monitor reading greater than (site-specific value).	CNMT P-Loss C.1	Containment radiation > 600 R/hr (RM-1CR-3589-SA or RM-1CR-3590-SB)	Containment radiation monitor readings greater than 601.2 R/hr, rounded to 600 R/hr for readability, indicate significant fuel damage well in excess of that required for loss of the RCS barrier and the Fuel Clad barrier.
CNMT P-Loss 4	**CNMT Integrity or Bypass** A. Containment pressure greater than (site-specific value)	CNMT P-Loss D.1	CSFST Containment-RED Path entry conditions me	Consistent with the generic developers note options CSFST Containment Red Path is used in lieu of containment pressure.

NEI FPB#	NEI IC Wording	HNP FPB #(s)	HNP FPB Wording	Difference Justification
	OR B. Explosive mixture exists inside containment **OR** C. 1. Containment pressure greater than (site-specific pressure setpoint) **AND** 2. Less than one full train of (site-specific system or equipment) is operating per design for 15 minutes or longer.	CNMT P-Loss D.2	Containment hydrogen concentration ≥ 4%	4% hydrogen concentration in the presence of oxygen represents an explosive mixture in containment.
		CNMT P-Loss D.3	Containment pressure > 10 psig with < one full train of depressurization equipment operating (one CNMT spray pump and two CNMT fan coolers) per design for > 15 min. (Note 1)	The Containment pressure setpoint (10 psig) is the pressure at which the Containment Spray System should actuate. Limiting LOCA analyses assume one Containment Spray pump and two CNMT fan coolers operate Added Note 1 consistent with other thresholds with a timing component.
CNMT P-Loss 5	**Other Indications** A. (site-specific as applicable)	N/A	N/A	No other site-specific Containment Potential Loss indication has been identified for HNP.
CNMT P-Loss 6	**Emergency Director Judgment** A. **ANY** condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.	CNMT P-Loss E.1	**Any** condition in the opinion of the Emergency Coordinator that indicates potential loss of the containment barrier	None

Category H

Hazards and Other Conditions Affecting Plant Safety

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HU1	Confirmed SECURITY CONDITION or threat MODE: All	HU1	Confirmed SECURITY CONDITION or threat. MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the (site-specific security shift supervision).	HU1.1	A SECURITY CONDITION that does **not** involve a HOSTILE ACTION as reported by the Security Shift Supervision **OR** Notification of a credible security threat directed at the site **OR** A validated notification from the NRC providing information of an aircraft threat	Example EALs #1, 2 and 3 have been combined into a single EAL for ease of presentation and use. The Security Shift Supervision is defined as the Security Shift Supervision.
2	Notification of a credible security threat directed at the site.			
3	A validated notification from the NRC providing information of an aircraft threat.			

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HU2	Seismic event greater than OBE level MODE: All	HU2	Seismic event greater than OBE level MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Seismic event greater than Operating Basis Earthquake (OBE) as indicated by: (site-specific indication that a seismic event met or exceeded OBE limits)	HU2.1	Seismic event > OBE as indicated by **any** of the following: • ALB-10/4-4, SEISMIC MON SYS OBE EXCEEDED is ALARMED • ALARM light on Seismic Switch Power Supply is LIT • **Any** red alarm light is LIT on the Response Spectrum Annunciator	The bulleted items represent site-specific OBE indications.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HU3	Hazardous event. MODE: All	HU3	Hazardous event MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	A tornado strike within the PROTECTED AREA.	HU3.1	A tornado strike within the PROTECTED AREA	None
2	Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component needed for the current operating mode.	HU3.2	Internal room or area FLOODING of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component needed for the current operating mode	None
3	Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release).	HU3.3	Movement of personnel within the PROTECTED AREA is IMPEDED due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release)	None
4	A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles.	HU3.4	A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles (Note 7)	Added reference to Note 7.
5	(Site-specific list of natural or technological hazard events)	N/A	N/A	No other site-specific hazard has been identified for HNP.
Note	EAL #3 does not apply to routine traffic impediments such as fog,	N/A	Note 7: This EAL does **not** apply to routine traffic	This note, designated Note #7, is intended to apply to generic example EAL #4, not #3 as specified in the generic guidance.

	snow, ice, or vehicle breakdowns or accidents.		impediments such as fog, snow, ice, or vehicle breakdowns or accidents.	

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HU4	FIRE potentially degrading the level of safety of the plant. MODE: All	HU4	FIRE potentially degrading the level of safety of the plant MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. A FIRE is NOT extinguished within 15-minutes of **ANY** of the following FIRE detection indications: • Report from the field (i.e., visual observation) • Receipt of multiple (more than 1) fire alarms or indications • Field verification of a single fire alarm **AND** b. The FIRE is located within **ANY** of the following plant rooms or areas: (site-specific list of plant rooms or areas)	HU4.1	A FIRE is **not** extinguished within 15 min. of **any** of the following FIRE detection indications (Note 1): • Report from the field (i.e., visual observation) • Receipt of multiple (more than 1) fire alarms or indications • Field verification of a single fire alarm **AND** The FIRE is located within **any** Table H-1 area	Table H-1 provides a tabularized list of site-specific fire areas.
2	a. Receipt of a single fire alarm (i.e., no other indications of a FIRE). **AND** b. The FIRE is located within	HU4.2	Receipt of a single fire alarm (i.e., **no** other indications of a FIRE) **AND** The fire alarm is indicating a	Table H-1 provides a list of site-specific fire areas.

	ANY of the following plant rooms or areas: (site-specific list of plant rooms or areas) **AND** c. The existence of a FIRE is not verified within 30-minutes of alarm receipt.		FIRE within **any** Table H-1 area **AND** The existence of a FIRE is **not** verified within 30 min. of alarm receipt (Note 1)	
3	A FIRE within the plant *or ISFSI* [*for plants with an ISFSI outside the plant Protected Area*] PROTECTED AREA not extinguished within 60-minutes of the initial report, alarm or indication.	HU4.3	A FIRE within the plant PROTECTED AREA **not** extinguished within 60 min. of the initial report, alarm or indication (Note 1)	HNP does not have an ISFSI.
4	A FIRE within the plant *or ISFSI* [*for plants with an ISFSI outside the plant Protected Area*] PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish.	HU4.4	A FIRE within the plant PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish	HNP does not have an ISFSI.
Note	**Note:** The Emergency Director should declare the Unusual Event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the word "Unusual".

Table H-1 **Fire Areas**
• Containment • Reactor Auxiliary Building • Fuel Handling Building • Turbine Building (including Transformer Area) • Emergency Diesel Generator Building • Diesel Fuel Oil Storage Building (DFOST) • ESW Intake Structure • Auxiliary Reservoir Intake Structure • NSW Structure • Switchyard • Yard 261 Duct Banks serving **any** of the above areas

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HU7	Other conditions exist which in the judgment of the Emergency Director warrant declaration of a (NO)UE MODE: All	HU7	Other conditions existing that in the judgment of the Emergency Coordinator warrant declaration of a UE MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.	HU7.1	Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of SAFETY SYSTEMS occurs.	None

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HA1	HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes. MODE: All	HA1	HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the (site-specific security shift supervision).	HA1.1	A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the Security Shift Supervision **OR** A validated notification from NRC of an aircraft attack threat within 30 min. of the site	Example EALs #1 and #2 have been combined into a single EAL for ease of use. The Security Shift Supervision is the site-specific security shift supervision.
2	A validated notification from NRC of an aircraft attack threat within 30 minutes of the site.			

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HA5	Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown. MODE: All	N/A	Gaseous release IMPEDING access to equipment necessary for normal plant operations, cooldown or shutdown. MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. Release of a toxic, corrosive, asphyxiant or flammable gas into any of the following plant rooms or areas: (site-specific list of plant rooms or areas with entry-related mode applicability identified) **AND** b. Entry into the room or area is prohibited or impeded.	HA5.1	Release of a toxic, corrosive, asphyxiant or flammable gas into **any** Table R-3/H-2 rooms or areas **AND** Entry into the room or area is prohibited or IMPEDED (Note 5)	Table R-3/H-2 provides a list of safe shutdown rooms/areas and applicable operating modes.
Note	**Note:** If the equipment in the listed room or area was already inoperable or out-of-service before the event occurred, then no emergency classification is warranted.	Note 5	If the equipment in the listed room or area was already inoperable or out-of-service before the event occurred, then **no** emergency classification is warranted.	None

Table R-3/H-2 Safe Operation & Shutdown Rooms/Areas	
Room/Area	**Mode(s)**
RAB 190 (RHR pumps)	4
RAB 216 (BIT)	1, 2, 3, 4, 5
RAB 236 (CSIP, Primary Sample Sink, AFW pumps, CCW pumps and HX, Boric Acid Transfer Pumps, Mezzanine Area)	1, 2, 3, 4, 5
RAB 261 (RHR Heat Exchangers, Demin. Valve Gallery, VCT Valve Gallery)	1, 2, 3, 4, 5
RAB 286 (Switchgear)	3,4,5
Containment Building	3
Steam Tunnel	1, 2, 3, 4
ESW intakes	1, 2, 3, 4, 5

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HA6	Control Room evacuation resulting in transfer of plant control to alternate locations. MODE: All	HA6	Control Room evacuation resulting in transfer of plant control to alternate locations MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	An event has resulted in plant control being transferred from the Control Room to (site-specific remote shutdown panels and local control stations).	HA6.1	An event has resulted in plant control being transferred from the Control Room to the ACP	ACP is the site-specific remote shutdown panels/local control stations.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HA7	Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert. MODE: All	HA7	Other conditions exist that in the judgment of the Emergency Coordinator warrant declaration of an Alert MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Other conditions exist which, in the judgment of the Emergency Director, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	HA7.1	Other conditions exist which, in the judgment of the Emergency Coordinator, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	None

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HS1	HOSTILE ACTION within the PROTECTED AREA MODE: All	HS1	HOSTILE ACTION within the PROTECTED AREA MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the (site-specific security shift supervision).	HS1.1	A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Shift Supervision	The Security Shift Supervision is the site-specific security shift supervision.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HS6	Inability to control a key safety function from outside the Control Room. MODE: All	HS6	Inability to control a key safety function from outside the Control Room MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. An event has resulted in plant control being transferred from the Control Room to (site-specific remote shutdown panels and local control stations). **AND** b. Control of **ANY** of the following key safety functions is not reestablished within (site-specific number of minutes). • Reactivity control • Core cooling [*PWR*] / RCP water level [*BWR*] • RCS heat removal	HS6.1	An event has resulted in plant control being transferred from the Control Room to the ACP **AND** Control of **any** of the following key safety functions is **not** reestablished within 15 min. (Note 1): • Reactivity • Core cooling • RCS heat removal	The ACP is the site-specific remote shutdown panels/local control stations.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HS7	Other conditions exist which in the judgment of the Emergency Director warrant declaration of a Site Area Emergency. MODE: All	HS7	Other conditions existing that in the judgment of the Emergency Coordinator warrant declaration of a Site Area Emergency MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts, (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.	HS7.1	Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts, (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the SITE BOUNDARY.	None

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HG1	HOSTILE ACTION resulting in loss of physical control of the facility. MODE: All	HG1	HOSTILE ACTION resulting in loss of physical control of the facility MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the (site-specific security shift supervision). **AND** b. **EITHER** of the following has occurred: 1. **ANY** of the following safety functions cannot be controlled or maintained. • Reactivity control • Core cooling [*PWR*]/RCP water level [*BWR*] • RCS heat removal **OR** 2. Damage to spent fuel has occurred or is IMMINENT.	HG1.1	A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Shift Supervision **AND EITHER** of the following has occurred: **Any** of the following safety functions cannot be controlled or maintained • Reactivity control • Core cooling • RCS heat removal **OR** Damage to spent fuel has occurred or is IMMINENT	The Security Shift Supervision is the site-specific security shift supervision.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
HG7	Other conditions exist which in the judgment of the Emergency Director warrant declaration of a General Emergency MODE: All	HG7	Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of a General Emergency MODE: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	HG7.1	Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	None

Category S

System Malfunction

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SU1	Loss of all offsite AC power capability to emergency buses for 15 minutes or longer. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU1	Loss of **all** offsite AC power capability to emergency buses for 15 minutes or longer MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Loss of **ALL** offsite AC power capability to (site-specific emergency buses) for 15 minutes or longer.	SU1.1	Loss of **all** offsite AC power capability to 6.9 KV emergency buses 1A-SA and 1B-SB for ≥ 15 min. (Note 1)	6.9 KV buses 1A-SA and 1B-SB are the site-specific emergency buses.
Note	The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the word "Unusual".

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SU2	UNPLANNED loss of Control Room indications for 15 minutes or longer. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU3	UNPLANNED loss of Control Room indications for 15 minutes or longer. MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	An UNPLANNED event results in the inability to monitor one or more of the following parameters from within the Control Room for 15 minutes or longer.	SU3.1	An UNPLANNED event results in the inability to monitor one or more Table S-1 parameters from within the Control Room for ≥ 15 min. (Note 1)	The site-specific Safety System Parameters are listed in Table S-1.
Note	The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the word "Unusual".

[BWR parameter list]	*[PWR parameter list]*
Reactor Power	Reactor Power
RCP Water Level	RCS Level
RCP Pressure	RCS Pressure
Primary Containment Pressure	In-Core/Core Exit Temperature
Suppression Pool Level	Levels in at least (site-specific number) steam generators
Suppression Pool Temperature	Steam Generator Auxiliary or Emergency Feed Water Flow

Table S-1 Safety System Parameters
• Reactor power • RCS level • RCS pressure • Core exit T/C temperature • Level in at least one S/G • Auxiliary or emergency feed flow in at least one S/G

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SU3	Reactor coolant activity greater than Technical Specification allowable limits. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU4	RCS activity greater than Technical Specification allowable limits MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	Changed 'reactor coolant activity" to "RCS activity" to conform to site specific terminology.

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	(Site-specific radiation monitor) reading greater than (site-specific value).	SU4.2	Valid Gross Failed Fuel Detector (RS-7411A) high alarm (> 1E+04 cpm)	The Gross Failed Fuel Detector System continuously monitors the delayed neutron activity in a sample drawn from the RCS. This provides a rapid indication of gross amounts of fission products contained in the RCS resulting from possible fuel defects.
2	Sample analysis indicates that a reactor coolant activity value is greater than an allowable limit specified in Technical Specifications.	SU4.1	RCS activity > Technical Specification Section 3.4.8 limits	Changed 'reactor coolant activity" to "RCS activity" to conform to site specific terminology. HNP T.S. Section 3.4.8 provides the TS allowable coolant activity limits.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SU4	RCS leakage for 15 minutes or longer. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU5	RCS leakage for 15 minutes or longer MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	RCS unidentified or pressure boundary leakage greater than (site-specific value) for 15 minutes or longer.	SU5.1	RCS unidentified or pressure boundary leakage > 10 gpm for ≥ 15 min. **OR** RCS identified leakage > 25 gpm for ≥ 15 min. **OR** Leakage from the RCS to a location outside containment > 25 gpm for ≥ 15 min. (Note 1)	Example EALs #1, 2 and 3 have been combined into a single EAL for usability.
2	RCS identified leakage greater than (site-specific value) for 15 minutes or longer.			
3	Leakage from the RCS to a location outside containment greater than 25 gpm for 15 minutes or longer.			
Note	The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the word "Unusual".

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SU5	Automatic or manual (trip [PWR] / scram [BWR]) fails to shutdown the reactor. MODE: Power Operation	SU6	Automatic or manual trip fails to shut down the reactor MODE: 1 - Power Operation	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. An automatic (trip [PWR] / scram [BWR]) did not shutdown the reactor. **AND** b. A subsequent manual action taken at the reactor control consoles is successful in shutting down the reactor.	SU6.1	An automatic trip did **not** shut down the reactor as indicated by reactor power ≥ 5% after **any** RPS setpoint is exceeded **AND** A subsequent automatic trip or manual trip action taken at the reactor control console (actuation of MCB Reactor Trip Switch #1, #2 or MCB Turbine Trip switch) is successful in shutting down the reactor as indicated by reactor power < 5% (Note 8)	As specified in the generic developers guidance "Developers may include site-specific EOP criteria indicative of a successful reactor shutdown in an EAL statement, the Basis or both (e.g., a reactor power level)." Reactor power < 5% is the site-specific indication of a successful reactor trip. Added the words "... as indicated by reactor power ≥ 5% after **any** RPS setpoint is exceeded" to clarify that it is a failure of the automatic trip when a valid trip signal has been exceed. Actuation of MCB Reactor Trip Switch #1, #2 or MCB Turbine Trip switch are the site-specific reactor control console trip switches credited for a successful manual trip.
2	a. A manual trip ([PWR] / scram [BWR]) did not shutdown the reactor. **AND** b. **EITHER** of the following: 1. A subsequent manual action taken at the reactor control consoles is successful in shutting	SU6.2	A manual trip did **not** shut down the reactor as indicated by reactor power ≥ 5% after **any** manual trip action was initiated **AND** A subsequent automatic trip or manual trip action taken at the reactor control console (actuation of MCB Reactor Trip Switch #1, #2 or MCB Turbine Trip switch) is	As specified in the generic developers guidance "Developers may include site-specific EOP criteria indicative of a successful reactor shutdown in an EAL statement, the Basis or both (e.g., a reactor power level)." Reactor power < 5% is the site-specific indication of a successful reactor trip. Added the words "... as indicated by reactor power ≥ 5% after **any** manual trip action was initiated" to clarify that it is a failure of any manual trip when an actual manual trip signal has been inserted. Combined conditions b.1 and b.2 into a single statement to simplify the presentation.

	down the reactor. **OR** 2 A subsequent automatic (trip [PWR] / scram [BWR]) is successful in shutting down the reactor.		successful in shutting down the reactor as indicated by reactor power < 5% (Note 8)	Actuation of MCB Reactor Trip Switch #1, #2 or MCB Turbine Trip switch are the site-specific reactor control console trip switches credited for a successful manual trip.
Notes	**Note:** A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.	N/A	Note 8: A manual action is **any** operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does **not** include manually driving in control rods or implementation of boron injection strategies.	None

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SU6	Loss of all onsite or offsite communications capabilities. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU7	Loss of **all** onsite or offsite communications capabilities. MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Loss of **ALL** of the following onsite communication methods: (site-specific list of communications methods)	SU7.1	Loss of **all** Table S-3 onsite communication methods **OR** Loss of **all** Table S-3 ORO communication methods **OR** Loss of **all** Table S-3 NRC communication methods	Example EALs #1, 2 and 3 have been combined into a single EAL for simplification of presentation. Table S-3 provides a site-specific list of onsite, ORO and NRC communications methods.
2	Loss of **ALL** of the following ORO communications methods: (site-specific list of communications methods)			
3	Loss of **ALL** of the following NRC communications methods: (site-specific list of communications methods)			

Table S-3 Communication Methods			
System	**Onsite**	**ORO**	**NRC**
PABX telephone (desk phones)	X	X	X
HE&EC PABX telephone		X	X
Site paging system	X		
Satellite phone		X	X
DEMNET		X	
Radio communications networks	X		
NRC ETS phone			X
NRC HPN phone			X

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SU7	Failure to isolate containment or loss of containment pressure control. [*PWR*] MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU8	Failure to isolate containment or loss of containment pressure control MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. Failure of containment to isolate when required by an actuation signal. **AND** b. **ALL** required penetrations are not closed within 15 minutes of the actuation signal.	SU8.1	**EITHER**: **Any** penetration is **not** isolated within 15 min. of a VALID containment isolation signal **OR** Containment pressure > 10 psig with < one full train of depressurization equipment operating (one CNMT spray pump and two CNMT fan coolers) per design for > 15 min. (Note 1)	Reworded EAL to better describe the intent. Penetrations cannot close, but they can be isolated by closure of one or more isolation valves associated with that penetration. The revised wording maintains the generic example EAL intent while more clearly describing failure to isolate threshold. The containment pressure setpoint (10 psig) is the pressure at which the containment depressurization equipment should actuate and begin performing its function.
2	a. Containment pressure greater than (site-specific pressure). **AND** b. Less than one full train of (site-specific system or equipment) is operating per design for 15 minutes or longer.			
N/A	N/A	N/A	Note 1: The Emergency Coordinator should declare the event	Added Note 1 to be consistent in its use for EAL thresholds with a timing component.

			promptly upon determining that time limit has been exceeded, or will likely be exceeded.	

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SA1	Loss of all but one AC power source to emergency buses for 15 minutes or longer. MODE: Power Operation, Startup	SA1	Loss of **all but one** AC power source to emergency buses for 15 minutes or longer. MODE: 1 - Power Operation	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. AC power capability to (site-specific emergency buses) is reduced to a single power source for 15 minutes or longer. **AND** b. Any additional single power source failure will result in a loss of all AC power to SAFETY SYSTEMS.	SA1.1	AC power capability to 6.9 KV emergency buses 1A-SA and 1B-SB reduced to a single power source for ≥ 15 min. (Note 1) **AND** **Any** additional single power source failure will result in loss of **all** AC power to SAFETY SYSTEMS	6.9 KV buses 1A-SA and 1B-SB are the site-specific emergency buses.
Note	The Emergency Director should declare the Alert promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the word "Alert".

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SA2	UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SA3	UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress. MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	An UNPLANNED event results in the inability to monitor one or more of the following parameters from within the Control Room for 15 minutes or longer. **AND** **ANY** of the following transient events in progress. • Automatic or manual runback greater than 25% thermal reactor power • Electrical load rejection greater than 25% full electrical load • Reactor scram [*BWR*] / trip [*PWR*] • ECCS (SI) actuation • Thermal power oscillations greater than 10% [*BWR*]	SA3.1	An UNPLANNED event results in the inability to monitor **one or more** Table S-1 parameters from within the Control Room for ≥ 15 min. (Note 1) **AND** **Any** significant transient is in progress, Table S-2	The site-specific Safety System Parameters are listed in Table S-1. The site-specific significant transients are listed in Table S-2. HNP is a PWR and thus does not include thermal power oscillations > 10%.

Note	The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the word "Alert".

[BWR parameter list]	*[PWR parameter list]*
Reactor Power	Reactor Power
RCP Water Level	RCS Level
RCP Pressure	RCS Pressure
Primary Containment Pressure	In-Core/Core Exit Temperature
Suppression Pool Level	Levels in at least (site-specific number) steam generators
Suppression Pool Temperature	Steam Generator Auxiliary or Emergency Feed Water Flow

Table S-1 Safety System Parameters
• Reactor power • RCS level • RCS pressure • Core exit T/C temperature • Level in at least one S/G • Auxiliary or emergency feed flow in at least one S/G

Table S-2 Significant Transients
• Reactor trip • Runback > 25% thermal power • Electrical load rejection > 25% electrical load • Safety injection actuation

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SA5	Automatic or manual (trip [PWR] / scram [BWR]) fails to shutdown the reactor, and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor. MODE: Power Operation	SA6	Automatic or manual trip fails to shut down the reactor and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor MODE: 1 - Power Operation	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. An automatic or manual (trip [PWR] / scram [BWR]) did not shutdown the reactor. **AND** b. Manual actions taken at the reactor control consoles are not successful in shutting down the reactor.	SA6.1	An automatic or manual trip fails to shut down the reactor as indicated by reactor power ≥ 5% **AND** Manual trip actions taken at the reactor control console (actuation of MCB Reactor Trip Switch #1, #2 or MCB Turbine Trip switch) are not successful in shutting down the reactor as indicated by reactor power ≥ 5% (Note 8)	As specified in the generic developers guidance "Developers may include site-specific EOP criteria indicative of a successful reactor shutdown in an EAL statement, the Basis or both (e.g., a reactor power level)." Reactor power < 5% is the site-specific indication of a successful reactor trip. Actuation of MCB Reactor Trip Switch #1, #2 or MCB Turbine Trip switch are the site-specific reactor control console trip switches credited for a successful manual trip.
Notes	**Note:** A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection	N/A	Note 8: A manual action is **any** operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does **not** include manually driving in control rods or	None

	strategies.		implementation of boron injection strategies.	

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SA9	Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SA9.1	Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. The occurrence of **ANY** of the following hazardous events: • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • (site-specific hazards) • Other events with similar hazard characteristics as determined by the Shift Manager **AND** b. **EITHER** of the following: 1. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode. **OR** 2. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode.	SA9.1	The occurrence of **any** Table S-4 hazardous event **AND EITHER:** • Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode • The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode	The hazardous events have been listed in Table S-4.

Table S-4 Hazardous Events
• Seismic event (earthquake) • Internal or external FLOODING event • High winds or tornado strike • FIRE • EXPLOSION • Other events with similar hazard characteristics as determined by the Shift Manager

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SS1	Loss of all offsite and all onsite AC power to emergency buses for 15 minutes or longer. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SS1	Loss of **all** offsite and **all** onsite AC power to emergency buses for 15 minutes or longer MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Loss of **ALL** offsite and **ALL** onsite AC power to (site-specific emergency buses) for 15 minutes or longer.	SS1.1	Loss of **all** offsite and **all** onsite AC power capability to 6.9 KV emergency buses 1A-SA and 1B-SB for ≥ 15 min. (Note 1)	6.9 KV buses 1A-SA and 1B-SB are the site-specific emergency buses.
Note	The Emergency Director should declare the Site Area Emergency promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SS5	Inability to shutdown the reactor causing a challenge to (core cooling [*PWR*] / RCP water level [*BWR*]) or RCS heat removal. MODE: Power Operation	SS6	Inability to shut down the reactor causing a challenge to core cooling or RCS heat removal MODE: 1 - Power Operation	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. An automatic or manual (trip [PWR] / scram [BWR]) did not shutdown the reactor. **AND** b. All manual actions to shutdown the reactor have been unsuccessful. **AND** c. **EITHER** of the following conditions exist: • (Site-specific indication of an inability to adequately remove heat from the core) • (Site-specific indication of an inability to adequately remove heat from the RCS)	SS6.1	An automatic or manual trip fails to shut down the reactor as indicated by reactor power ≥ 5% **AND** **All** actions to shut down the reactor are **not** successful as indicated by reactor power ≥ 5% **AND EITHER:** • Core Cooling RED Path entry conditions met • Heat Sink RED Path entry conditions met	As specified in the generic developers guidance "Developers may include site-specific EOP criteria indicative of a successful reactor shutdown in an EAL statement, the Basis or both (e.g., a reactor power level)." Reactor power < 5% is the site-specific indication of a successful reactor trip. Indication that core cooling is extremely challenged is manifested by CSFST Core Cooling RED Path entry conditions met. Indication that heat removal is extremely challenged is manifested by CSFST Heat Sink RED Path entry conditions met.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SS8	Loss of all Vital DC power for 15 minutes or longer. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SS2	Loss of **all** vital DC power for 15 minutes or longer. MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	Indicated voltage is less than (site-specific bus voltage value) on **ALL** (site-specific Vital DC busses) for 15 minutes or longer.	SS2.1	Loss of **all** 125 VDC power based on battery bus voltage indications < 105 VDC on **both** emergency DC buses (DP-1A-SA, DP-1B-SB) for ≥ 15 min. (Note 1)	105 VDC is the site-specific minimum vital DC bus voltage. DC buses DP-1A-SA and DP-1B-SB are the site-specific vital DC buses.
Note	The Emergency Director should declare the Site Area Emergency promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SG1	Prolonged loss of all offsite and all onsite AC power to emergency buses. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SG1a	Prolonged loss of **all** offsite and **all** onsite AC power to emergency buses MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	NEI ICs SG1 and SG8 are grouped under the same HNP IC for simplification. The HNP emergency buses are the site-specific emergency buses.

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. Loss of **ALL** offsite and **ALL** onsite AC power to (site-specific emergency buses). **AND** b. **EITHER** of the following: • Restoration of at least one AC emergency bus in less than (site-specific hours) is not likely. • (Site-specific indication of an inability to adequately remove heat from the core)	SG1.1	Loss of **all** offsite and **all** onsite AC power capability to 6.9 KV emergency buses 1A-SA and 1B-SB **AND EITHER:** • Restoration of at least one emergency bus in < 4 hours is **not** likely (Note 1) • Core Cooling RED Path entry conditions met	6.9 KV buses 1A-SA and 1B-SB are the site-specific emergency buses. 4 hours is the site-specific SBO coping analysis time. CSFST Core Cooling RED Path entry conditions met indicates significant core exit superheating and core uncovery.
Note	The Emergency Director should declare the General Emergency promptly upon determining that (site-specific hours) has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

NEI IC#	NEI IC Wording	HNP IC#(s)	HNP IC Wording	Difference Justification
SG8	Loss of all AC and Vital DC power sources for 15 minutes or longer. MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SG1b	Loss of **all** AC and vital DC power sources for 15 minutes or longer MODE: 1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown	NEI ICs SG1 and SG8 are grouped under the same HNP IC for simplification.

NEI Ex. EAL #	NEI Example EAL Wording	HNP EAL #	HNP EAL Wording	Difference Justification
1	a. Loss of **ALL** offsite and **ALL** onsite AC power to (site-specific emergency buses) for 15 minutes or longer. **AND** b. Indicated voltage is less than (site-specific bus voltage value) on ALL (site-specific Vital DC busses) for 15 minutes or longer.	SG1.2	Loss of **all** offsite and **all** onsite AC power capability to 6.9 KV emergency buses 1A-SA and 1B-SB for ≥ 15 min. **AND** Loss of **all** 125 VDC power based on battery bus voltage indications < 105 VDC on **both** emergency DC buses (DP-1A-SA, DP-1B-SB) for ≥ 15 min. (Note 1)	6.9 KV buses 1A-SA and 1B-SB are the site-specific emergency buses. 105 VDC is the site-specific minimum vital DC bus voltage. DP-1A-SA and DP-1B-SB are the site-specific vital DC buses.
Note	The Emergency Director should declare the General Emergency promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.	N/A	Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.	The classification timeliness note has been standardized across the HNP EAL scheme by referencing the "time limit" specified within the EAL wording and deleting the specific classification.

SERIAL HNP-15-025

ENCLOSURE 3

HARRIS NUCLEAR PLANT EMERGENCY ACTION LEVEL TECHNICAL BASES DOCUMENT, EP-EAL,

"EMERGENCY ACTION LEVEL TECHNICAL BASES" (CLEAN VERSION)

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

RENEWED LICENSE NUMBER NPF-63

EMERGENCY ACTION LEVEL TECHNICAL BASES

(Clean Version)

Revision 0 4/29/15

TABLE OF CONTENTS

1.0 PURPOSE

This document provides an explanation and rationale for each Emergency Action Level (EAL) included in the EAL Upgrade Project for Harris Nuclear Station (HNP). It should be used to facilitate review of the HNP EALs and provide historical documentation for future reference. Decision-makers responsible for implementation of PEP-110, Emergency Classification and Protective Action Recommendations, may use this document as a technical reference in support of EAL interpretation. This information may assist the Emergency Coordinator in making classifications, particularly those involving judgment or multiple events. The basis information may also be useful in training and for explaining event classifications to off-site officials.

The expectation is that emergency classifications are to be made as soon as conditions are present and recognizable for the classification, but within 15 minutes or less in all cases of conditions present. Use of this document for assistance is not intended to delay the emergency classification.

Because the information in a basis document can affect emergency classification decision-making (e.g., the Emergency Coordinator refers to it during an event), the NRC staff expects that changes to the basis document will be evaluated in accordance with the provisions of 10 CFR 50.54(q).

2.0 DISCUSSION

2.1 Background

EALs are the plant-specific indications, conditions or instrument readings that are utilized to classify emergency conditions defined in the HNP 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) Revisions 4 and 5 were subsequently issued for industry implementation. 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.
- 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 (ISFSIs).
- Simplifying the fission product barrier EAL threshold for a Site Area Emergency.

Subsequently, Revision 6 of NEI 99-01 has been issued which incorporates resolutions to numerous implementation issues including the NRC EAL Frequently Asked Questions (FAQs). Using NEI 99-01 Revision 6, "Methodology for the Development of Emergency Action Levels for Non-Passive Reactors," November 2012 (ADAMS Accession Number ML12326A805) (ref.

4.1.1), HNP conducted an EAL implementation upgrade project that produced the EALs discussed herein.

2.2 Fission Product Barriers

Fission product barrier thresholds represent threats to the defense in depth design concept that precludes the release of radioactive fission products to the environment. This concept relies on multiple physical barriers, any one of which, if maintained intact, precludes the release of significant amounts of radioactive fission products to the environment.

Many of the EALs derived from the NEI methodology are fission product barrier threshold based. That is, the conditions that define the EALs are based upon thresholds that represent the loss or potential loss of one or more of the three fission product barriers. "Loss" and "Potential Loss" signify the relative damage and threat of damage to the barrier. A "Loss" threshold means the barrier no longer assures containment of radioactive materials. A "Potential Loss" threshold implies an increased probability of barrier loss and decreased certainty of maintaining the barrier.

The primary fission product barriers are:

A. Fuel Clad (FC): The Fuel Clad Barrier is the zircalloy tubes that contain the fuel pellets.

B. Reactor Coolant System (RCS): 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.

C. Containment (CNMT): The Containment Barrier includes the containment building and 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. Containment Barrier thresholds are used as criteria for escalation of the ECL from Alert to a Site Area Emergency or a General Emergency

2.3 Fission Product Barrier Classification Criteria

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

Alert:

Any loss or any potential loss of either Fuel Clad or RCS barrier

Site Area Emergency:

Loss or potential loss of any two barriers

General Emergency:

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

2.4 EAL Organization

The HNP EAL scheme includes the following features:

- Division of the EAL set into three broad groups:
    - EALs applicable under all plant operating modes – This group would be reviewed by the EAL-user any time emergency classification is considered.
    - EALs applicable only under hot operating modes – This group would only be reviewed by the EAL-user when the plant is in Hot Shutdown, Hot Standby, Startup, or Power Operation mode.
    - EALs applicable only under cold operating modes – This group would only be reviewed by the EAL-user when the plant is in Cold Shutdown, Refueling or Defueled mode.

  The purpose of the groups is to avoid review of hot condition EALs when the plant is in a cold condition and avoid review of cold condition EALs when the plant is in a hot condition. This approach significantly minimizes the total number of EALs that must be reviewed by the EAL-user for a given plant condition, reduces EAL-user reading burden and, thereby, speeds identification of the EAL that applies to the emergency.

- Within each group, assignment of EALs to categories and subcategories:

Category and subcategory titles are selected to represent conditions that are operationally significant to the EAL-user. The HNP EAL categories are aligned to and represent the NEI 99-01"Recognition Categories." Subcategories are used in the HNP scheme as necessary to further divide the EALs of a category into logical sets of possible emergency classification thresholds. The HNP EAL categories and subcategories are listed below.

EAL Groups, Categories and Subcategories

EAL Group/Category	EAL Subcategory
Any Operating Mode:	
R – Abnormal **R**ad Levels / Rad Effluent	1 – Radiological Effluent 2 – Irradiated Fuel Event 3 – Area Radiation Levels
H – **H**azards and Other Conditions Affecting Plant Safety	1 – Security 2 – Seismic Event 3 – Natural or Technological Hazard 4 – Fire 5 – Hazardous Gas 6 – Control Room Evacuation 7 – Emergency Coordinator Judgment
Hot Conditions:	
S – **S**ystem Malfunction	1 – Loss of Emergency AC Power 2 – Loss of Vital DC Power 3 – Loss of Control Room Indications 4 – RCS Activity 5 – RCS Leakage 6 – RPS Failure 7 – Loss of Communications 8 – Containment Failure 9 – Hazardous Event Affecting Safety Systems
F – **F**ission Product Barrier Degradation	None
Cold Conditions:	
C – **C**old Shutdown / Refueling System Malfunction	1 – RCS Level 2 – Loss of Emergency AC Power 3 – RCS Temperature 4 – Loss of Vital DC Power 5 – Loss of Communications 6 – Hazardous Event Affecting Safety Systems

The primary tool for determining the emergency classification level is the EAL Classification Matrix. The user of the EAL Classification Matrix may (but is not required to) consult the EAL Technical Bases Document in order to obtain additional information concerning the EALs under classification consideration. The user should consult Section 3.0 and Attachments 1 & 2 of this document for such information.

2.5 Technical Bases Information

EAL technical bases are provided in Attachment 1 for each EAL according to EAL group (Any, Hot, Cold), EAL category (R, C, H, S, F and E) and EAL subcategory. A summary explanation of each category and subcategory is given at the beginning of the technical bases discussions of the EALs included in the category. For each EAL, the following information is provided:

Category Letter & Title

Subcategory Number & Title

Initiating Condition (IC)

Site-specific description of the generic IC given in NEI 99-01 Rev. 6.

EAL Identifier (enclosed in rectangle)

Each EAL is assigned a unique identifier to support accurate communication of the emergency classification to onsite and offsite personnel. Four characters define each EAL identifier:

1. First character (letter): Corresponds to the EAL category as described above (R, C, H, S, F or E)

2. Second character (letter): The emergency classification (G, S, A or U)

   G = General Emergency
   S = Site Area Emergency
   A = Alert
   U = Unusual Event

3. Third character (number): Subcategory number within the given category. Subcategories are sequentially numbered beginning with the number one (1). If a category does not have a subcategory, this character is assigned the number one (1).

4. Fourth character (number): The numerical sequence of the EAL within the EAL subcategory. If the subcategory has only one EAL, it is given the number one (1).

Classification (enclosed in rectangle):

Unusual Event (U), Alert (A), Site Area Emergency (S) or General Emergency (G)

EAL (enclosed in rectangle)

Exact wording of the EAL as it appears in the EAL Classification Matrix

Mode Applicability

One or more of the following plant operating conditions comprise the mode to which each EAL is applicable: 1 - Power Operations, 2 - Startup, 3 – Hot Standby, 4 - Hot Shutdown, 5 - Cold Shutdown, 6 - Refueling, D - Defueled, or All. (See Section 2.6 for operating mode definitions)

Definitions:

If the EAL wording contains a defined term, the definition of the term is included in this section. These definitions can also be found in Section 5.1.

Basis:

A Plant-Specific basis section that provides HNP-relevant information concerning the EAL. This is followed by a Generic basis section that provides a description of the rationale for the EAL as provided in NEI 99-01 Rev. 6.

HNP Basis Reference(s):

Site-specific source documentation from which the EAL is derived

2.6 Operating Mode Applicability (ref. 4.1.7)

1 Power Operations

$K_{eff} \geq 0.99$ and reactor thermal power > 5% and average coolant temperature $\geq$ 350°F

2 Startup

$K_{eff} \geq 0.99$ and reactor thermal power $\leq$ 5% average coolant temperature $\geq$ 350°F

3 Hot Standby

$K_{eff} < 0.99$ and average coolant temperature $\geq$ 350°F

3 Hot Shutdown

$K_{eff} < 0.99$ and average coolant temperature 350°F > T_{avg} > 200 °F (excluding decay heat)

4 Cold Shutdown

$K_{eff} < 0.99$ and average coolant temperature $T_{avg} \leq$ 200°F

5 Refueling

$K_{eff} < 0.95$ and average coolant temperature $T_{avg} \leq$ 140°F; fuel in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed

D Defueled

All reactor fuel removed from reactor pressure 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 being 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.

3.0 GUIDANCE ON MAKING EMERGENCY CLASSIFICATIONS

3.1 General Considerations

When making an emergency classification, the Emergency Coordinator must consider all information having a bearing on the proper assessment of an Initiating Condition (IC). This includes the Emergency Action Level (EAL) plus the associated Operating Mode Applicability, Notes, and the informing basis information. In the Recognition Category F matrices, EALs are based on loss or potential loss of Fission Product Barrier Thresholds.

3.1.1 Classification Timeliness

NRC regulations require the licensee to establish and maintain the capability to assess, classify, and declare an emergency condition within 15 minutes after the availability of indications to plant operators that an emergency action level has been exceeded and to promptly declare the emergency condition as soon as possible following identification of the appropriate emergency classification level. The NRC staff has provided guidance on implementing this requirement in NSIR/DPR-ISG-01, "Interim Staff Guidance, Emergency Planning for Nuclear Power Plants" (ref. 4.1.10).

3.1.2 Valid Indications

All emergency classification assessments shall be based upon valid indications, reports or conditions. A valid indication, report, or condition, is one that has been verified through appropriate means such that there is no doubt regarding the indicator's operability, the condition's existence, or the report's accuracy. For example, verification could be accomplished through an instrument channel check, response on related or redundant indicators, or direct observation by plant personnel.

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's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

3.1.3 Imminent Conditions

For ICs and EALs that have a stipulated time duration (e.g., 15 minutes, 30 minutes, etc.), the Emergency Coordinator should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. If an ongoing radiological release is detected and the release start time is unknown, it should be assumed that the release duration specified in the IC/EAL has been exceeded, absent data to the contrary.

3.1.4 Planned vs. Unplanned Events

A planned work activity that results in an expected event or condition which meets or exceeds an EAL does not warrant an emergency declaration provided that: 1) the activity proceeds as planned, and 2) the plant remains within the limits imposed by the operating license. Such activities include planned work to test, manipulate, repair, maintain or modify a system or

component. In these cases, the controls associated with the planning, preparation and execution of the work will ensure that compliance is maintained with all aspects of the operating license provided that the activity proceeds and concludes as expected. Events or conditions of this type may be subject to the reporting requirements of 10 § CFR 50.72 (ref. 4.1.4).

3.1.5 Classification Based on Analysis

The assessment of some EALs is based on the results of analyses that are necessary to ascertain whether a specific EAL threshold has been exceeded (e.g., dose assessments, chemistry sampling, RCS leak rate calculation, etc.). For these EALs, the EAL wording or the associated basis discussion will identify the necessary analysis. In these cases, the 15-minute declaration period starts with the availability of the analysis results that show the threshold to be exceeded (i.e., this is the time that the EAL information is first available). The NRC expects licensees to establish the capability to initiate and complete EAL-related analyses within a reasonable period of time (e.g., maintain the necessary expertise on-shift).

3.1.6 Emergency Coordinator Judgment

While the EALs have been developed to address a full spectrum of possible events and conditions which may warrant emergency classification, a provision for classification based on operator/management experience and judgment is still necessary. The NEI 99-01 EAL scheme provides the Emergency Coordinator with the ability to classify events and conditions based upon judgment using EALs that are consistent with the Emergency Classification Level (ECL) definitions (refer to Category H). The Emergency Coordinator will need to determine if the effects or consequences of the event or condition reasonably meet or exceed a particular ECL definition. A similar provision is incorporated in the Fission Product Barrier Tables; judgment may be used to determine the status of a fission product barrier.

3.2 Classification Methodology

To make an emergency classification, the user will compare an event or condition (i.e., the relevant plant indications and reports) to an EAL(s) and determine if the EAL has been met or exceeded. The evaluation of an EAL must be consistent with the related Operating Mode Applicability and Notes. If an EAL has been met or exceeded, the associated IC is likewise met, the emergency classification process "clock" starts, and the ECL must be declared in accordance with plant procedures no later than fifteen minutes after the process "clock" started.

When assessing an EAL that specifies a time duration for the off-normal condition, the "clock" for the EAL time duration runs concurrently with the emergency classification process "clock." For a full discussion of this timing requirement, refer to NSIR/DPR-ISG-01 (ref. 4.1.10).

3.2.1 Classification of Multiple Events and Conditions

When multiple emergency events or conditions are present, the user will identify all met or exceeded EALs. The highest applicable ECL identified during this review is declared. For example:

- If an Alert EAL and a Site Area Emergency EAL are met, whether at one unit or at two different units, a Site Area Emergency should be declared.

There is no "additive" effect from multiple EALs meeting the same ECL. For example:

- If two Alert EALs are met, whether at one unit or at two different units, an Alert should be declared.

Related guidance concerning classification of rapidly escalating events or conditions is provided in Regulatory Issue Summary (RIS) 2007-02, *Clarification of NRC Guidance for Emergency Notifications During Quickly Changing Events* (ref. 4.1.2).

3.2.2 Consideration of Mode Changes During Classification

The mode in effect at the time that an event or condition occurred, and prior to any plant or operator response, is the mode that determines whether or not an IC is applicable. If an event or condition occurs, and results in a mode change before the emergency is declared, the emergency classification level is still based on the mode that existed at the time that the event or condition was initiated (and not when it was declared). Once a different mode is reached, any new event or condition, not related to the original event or condition, requiring emergency classification should be evaluated against the ICs and EALs applicable to the operating mode at the time of the new event or condition.

For events that occur in Cold Shutdown or Refueling, escalation is via EALs that are applicable in the Cold Shutdown or Refueling modes, even if Hot Shutdown (or a higher mode) is entered during the subsequent plant response. In particular, the fission product barrier EALs are applicable only to events that initiate in the Hot Shutdown mode or higher.

3.2.3 Classification of Imminent Conditions

Although EALs provide specific thresholds, the Emergency Coordinator must remain alert to events or conditions that could lead to meeting or exceeding an EAL within a relatively short period of time (i.e., a change in the ECL is IMMINENT). If, in the judgment of the Emergency Coordinator, meeting an EAL is IMMINENT, the emergency classification should be made as if the EAL has been met. While applicable to all emergency classification levels, this approach is particularly important at the higher emergency classification levels since it provides additional time for implementation of protective measures.

3.2.4 Emergency Classification Level Upgrading and Downgrading

An ECL may be downgraded when the event or condition that meets the highest IC and EAL no longer exists, and other site-specific downgrading requirements are met. If downgrading the ECL is deemed appropriate, the new ECL would then be based on a lower applicable IC(s) and EAL(s). The ECL may also simply be terminated.

As noted above, guidance concerning classification of rapidly escalating events or conditions is provided in RIS 2007-02 (ref. 4.1.2).

3.2.5 Classification of Short-Lived Events

Event-based ICs and EALs define a variety of specific occurrences that have potential or actual safety significance. By their nature, some of these events may be short-lived and, thus, over before the emergency classification assessment can be completed. If an event occurs that meets or exceeds an EAL, the associated ECL must be declared regardless of its continued presence at the time of declaration. Examples of such events include an earthquake or a failure of the reactor protection system to automatically trip the reactor followed by a successful manual trip.

3.2.6 Classification of Transient Conditions

Many of the ICs and/or EALs employ time-based criteria. These criteria will require that the IC/EAL conditions be present for a defined period of time before an emergency declaration is warranted. In cases where no time-based criterion is specified, it is recognized that some transient conditions may cause an EAL to be met for a brief period of time (e.g., a few seconds to a few minutes). The following guidance should be applied to the classification of these conditions.

EAL momentarily met during expected plant response - In instances where an EAL is briefly met during an expected (normal) plant response, an emergency declaration is not warranted provided that associated systems and components are operating as expected, and operator actions are performed in accordance with procedures.

EAL momentarily met but the condition is corrected prior to an emergency declaration – If an operator takes prompt manual action to address a condition, and the action is successful in correcting the condition prior to the emergency declaration, then the applicable EAL is not considered met and the associated emergency declaration is not required. For illustrative purposes, consider the following example:

> An ATWS occurs and the high pressure ECCS systems fail to automatically start. RPV level rapidly decreases and the plant enters an inadequate core cooling condition (a potential loss of both the fuel clad and RCS barriers). If an operator manually starts a high pressure ECCS system in accordance with an EOP step and clears the inadequate core cooling condition prior to an emergency declaration, then the classification should be based on the ATWS only.

It is important to stress that the 15-minute emergency classification assessment period (process clock) is not a "grace period" during which a classification may be delayed to allow the performance of a corrective action that would obviate the need to classify the event. Emergency classification assessments must be deliberate and timely, with no undue delays. The provision discussed above addresses only those rapidly evolving situations when an operator is able to take a successful corrective action prior to the Emergency Coordinator completing the review and steps necessary to make the emergency declaration. This provision is included to ensure that any public protective actions resulting from the emergency classification are truly warranted by the plant conditions.

3.2.7 After-the-Fact Discovery of an Emergency Event or Condition

In some cases, an EAL may be met but the emergency classification was not made at the time of the event or condition. This situation can occur when personnel discover that an event or condition existed which met an EAL, but no emergency was declared, and the event or

condition no longer exists at the time of discovery. This may be due to the event or condition not being recognized at the time or an error that was made in the emergency classification process.

In these cases, no emergency declaration is warranted; however, the guidance contained in NUREG-1022 (ref. 4.1.3) is applicable. Specifically, the event should be reported to the NRC in accordance with 10 CFR § 50.72 (ref. 4.1.4) within one hour of the discovery of the undeclared event or condition. The licensee should also notify appropriate State and local agencies in accordance with the agreed upon arrangements.

3.2.8 Retraction of an Emergency Declaration

Guidance on the retraction of an emergency declaration reported to the NRC is discussed in NUREG-1022 (ref. 4.1.3).

4.0 REFERENCES

4.1 Developmental

4.1.1 NEI 99-01 Revision 6, Methodology for the Development of Emergency Action Levels for Non-Passive Reactors, ADAMS Accession Number ML12326A805

4.1.2 RIS 2007-02 Clarification of NRC Guidance for Emergency Notifications During Quickly Changing Events, February 2, 2007.

4.1.3 NUREG-1022 Event Reporting Guidelines: 10CFR50.72 and 50.73

4.1.4 10 § CFR 50.72 Immediate Notification Requirements for Operating Nuclear Power Reactors

4.1.5 10 § CFR 50.73 License Event Report System

4.1.6 FSAR Figure 1.2.2-1, Site Plan

4.1.7 Technical Specifications Table 1.2 Operational Modes

4.1.8 Technical Specifications Section 3/4.9.4

4.1.9 PRO-NGGC-0201 NGG Procedure Writers Guide

4.1.10 NSIR/DPR-ISG-01 Interim Staff Guidance, Emergency Planning for Nuclear Power Plants

4.1.11 PLP-201 Emergency Plan

4.1.12 GP-008 Draining the Reactor Coolant System

4.1.13 NCR 573223

4.2 Implementing

4.2.1 PEP-110, Emergency Classification and Protective Action Recommendations

4.2.2 NEI 99-01 Rev. 6 to HNP EAL Comparison Matrix

4.2.3 HNP EAL Matrix

5.0 DEFINITIONS, ACRONYMS & ABBREVIATIONS

5.1 Definitions (ref. 4.1.1 except as noted)

Selected terms used in Initiating Condition and Emergency Action Level statements are set in all capital letters (e.g., ALL CAPS). These words are defined terms that have specific meanings as used in this document. The definitions of these terms are provided below.

Alert

Events are in process, or have occurred, which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of hostile action. Any releases are expected to be small fractions of the EPA Protective Action Guideline exposure levels.

Containment Closure

The procedurally defined actions taken to secure containment and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions.

As applied to HNP, Containment Closure is established when containment penetration closure is established in accordance with Technical Specifications 3/4.9.4 (ref. 4.1.8).

EPA PAGs

Environment Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HNP to recommend protective actions for the general public to offsite planning agencies.

Explosion

A rapid, violent and catastrophic failure of a piece of equipment due to combustion, chemical reaction or overpressurization. A release of steam (from high energy lines or components) or an electrical component failure (caused by short circuits, grounding, arcing, etc.) should not automatically be considered an explosion. Such events require a post-event inspection to determine if the attributes of an explosion are present.

Faulted

The term applied to a steam generator that has a steam leak on the secondary side of sufficient size to cause an uncontrolled drop in steam generator pressure or the steam generator to become completely depressurized.

Fire

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.

Flooding

A condition where water is entering a room or area faster than installed equipment is capable of removal, resulting in a rise of water level within the room or area.

General Emergency

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile actions that result in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Hostage

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

Hostile Action

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

Hostile Force

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

Imminent

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

Impede(d)

Personnel access to a room or area is hindered to an extent that extraordinary measures are necessary to facilitate entry of personnel into the affected room/area (e.g., requiring use of protective equipment, such as SCBAs, that is not routinely employed).

Maintain

Take appropriate action to hold the value of an identified parameter within specified limits.

Normal Levels

As applied to radiological IC/EALs, the highest reading in the past twenty-four hours excluding the current peak value.

Owner Controlled Area

That area surrounding the Protected Area beyond which HNP exercises access control.

Projectile

An object directed toward a Nuclear Power Plant that could cause concern for its continued operability, reliability, or personnel safety.

Protected Area

An area which normally encompasses all controlled areas within the security protected area fence as depicted in FSAR Figure 1.2.2-1, Site Plan (ref. 4.1.6).

RCS Intact

The RCS should be considered intact when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams).

Refueling Pathway

The reactor refueling cavity, spent fuel pool and fuel transfer canal comprise the refueling pathway.

Reduced Inventory

RCS water level greater than 36 inches below the Reactor Vessel Flange (ref. 4.1.12).

Ruptured

The condition of a steam generator in which primary-to-secondary leakage is of sufficient magnitude to require a safety injection.

Restore

Take the appropriate action required to return the value of an identified parameter to the applicable limits

Safety System

A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related (as defined in 10CFR50.2):

Those structures, systems and components that are relied upon to remain functional during and following design basis events to assure:

(1) The integrity of the reactor coolant pressure boundary;

(2) The capability to shut down the reactor and maintain it in a safe shutdown condition;

(3) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures.

Security Condition

Any security event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel, or a potential degradation to the level of safety of the plant. A security condition does not involve a hostile action.

Site Boundary

A circle of approximately 2500 ft. radius from the center of the containment building (0.47 miles) (ref. 4.1.13).

Unisolable

An open or breached system line that cannot be isolated, remotely or locally.

Unplanned

A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

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's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

Visible Damage

Damage to a component or structure that is readily observable without measurements, testing, or analysis. The visual impact of the damage is sufficient to cause concern regarding the operability or reliability of the affected component or structure.

5.2 Abbreviations/Acronyms

°F ..... Degrees Fahrenheit
° ..... Degrees
AC ..... Alternating Current
AP ..... Abnormal Operating Procedure
ATWS ..... Anticipated Transient Without Scram
CDE ..... Committed Dose Equivalent
CFR ..... Code of Federal Regulations
CSFST ..... Critical Safety Function Status Tree
DBA ..... Design Basis Accident
DC ..... Direct Current
EAL ..... Emergency Action Level
EC ..... Emergency Coordinator
ECCS ..... Emergency Core Cooling System
ECL ..... Emergency Classification Level
EOF ..... Emergency Operations Facility
EOP ..... Emergency Operating Procedure
EPA ..... Environmental Protection Agency
ERG ..... Emergency Response Guideline
EPIP ..... Emergency Plan Implementing Procedure
ESF ..... Engineered Safety Feature
FAA ..... Federal Aviation Administration
FBI ..... Federal Bureau of Investigation
FEMA ..... Federal Emergency Management Agency
FSAR ..... Final Safety Analysis Report
GE ..... General Emergency
HNP ..... Harris Nuclear Plant
IC ..... Initiating Condition
IPEEE ..... Individual Plant Examination of External Events (Generic Letter 88-20)
ISFSI ..... Independent Spent Fuel Storage Installation
K_{eff} ..... Effective Neutron Multiplication Factor
LCO ..... Limiting Condition of Operation
LER ..... Licensee Event Report
LOCA ..... Loss of Coolant Accident

LWR ..... Light Water Reactor
MPC ..... Maximum Permissible Concentration/Multi-Purpose Canister
MSIV ..... Main Steam Isolation Valve
MSL ..... Main Steam Line
mR, mRem, mrem, mREM ..... milli-Roentgen Equivalent Man
MW ..... Megawatt
RCS ..... Reactor Coolant System
NEI ..... Nuclear Energy Institute
NESP ..... National Environmental Studies Project
NPP ..... Nuclear Power Plant
NRC ..... Nuclear Regulatory Commission
NSSS ..... Nuclear Steam Supply System
NORAD ..... North American Aerospace Defense Command
(NO)UE ..... Notification of Unusual Event
OBE ..... Operating Basis Earthquake
OCA ..... Owner Controlled Area
ODCM ..... Off-site Dose Calculation Manual
ORO ..... Offsite Response Organization
PA ..... Protected Area
PAG ..... Protective Action Guideline
PRA/PSA ..... Probabilistic Risk Assessment / Probabilistic Safety Assessment
PWR ..... Pressurized Water Reactor
PSIG ..... Pounds per Square Inch Gauge
R ..... Roentgen
RAB ..... Reactor Auxiliary Building
Rem, rem, REM ..... Roentgen Equivalent Man
RETS ..... Radiological Effluent Technical Specifications
RPS ..... Reactor Protection System
RV ..... Reactor Vessel
RVLIS ..... Reactor Vessel Level Indicating System
SAR ..... Safety Analysis Report
SBGTS ..... Stand-By Gas Treatment System
SBO ..... Station Blackout
SCBA ..... Self-Contained Breathing Apparatus

SG ..... Steam Generator
SI ..... Safety Injection
SLC ..... Selected Licensee Commitment
SPDS ..... Safety Parameter Display System
SRO ..... Senior Reactor Operator
SSF ..... Safe Shutdown Facility
TEDE ..... Total Effective Dose Equivalent
TOAF ..... Top of Active Fuel
TSC ..... Technical Support Center
WOG ..... Westinghouse Owners Group

6.0 HNP-TO-NEI 99-01 Rev. 6 EAL CROSS-REFERENCE

This cross-reference is provided to facilitate association and location of a HNP EAL within the NEI 99-01 IC/EAL identification scheme. Further information regarding the development of the HNP EALs based on the NEI guidance can be found in the EAL Comparison Matrix.

HNP	NEI 99-01 Rev. 6	
EAL	**IC**	**Example EAL**
RU1.1	AU1	1, 2
RU1.2	AU1	3
RU2.1	AU2	1
RA1.1	AA1	1
RA1.2	AA1	2
RA1.3	AA1	3
RA1.4	AA1	4
RA2.1	AA2	1
RA2.2	AA2	2
RA2.3	AA2	3
RA3.1	AA3	1
RA3.2	AA3	2
RS1.1	AS1	1
RS1.2	AS1	2
RS1.3	AS1	3
RS2.1	AS2	1
RG1.1	AG1	1
RG1.2	AG1	2
RG1.3	AG1	3

HNP	NEI 99-01 Rev. 6	
EAL	**IC**	**Example EAL**
RG2.1	AG2	1
CU1.1	CU1	1
CU1.2	CU1	2
CU2.1	CU2	1
CU3.1	CU3	1
CU3.2	CU3	2
CU4.1	CU4	1
CU5.1	CU5	1, 2, 3
CA1.1	CA1	1
CA1.2	CA1	2
CA2.1	CA2	1
CA3.1	CA3	1, 2
CA6.1	CA6	1
CS1.1	CS1	1
CS1.2	CS1	2
CS1.3	CS1	3
CG1.1	CG1	1
CG1.2	CG1	2
FA1.1	FA1	1
FS1.1	FS1	1
FG1.1	FG1	1
HU1.1	HU1	1, 2 3
HU2.1	HU2	1
HU3.1	HU3	1

HNP	NEI 99-01 Rev. 6	
EAL	**IC**	**Example EAL**
HU3.2	HU3	2
HU3.3	HU3	3
HU3.4	HU3	4
HU4.1	HU4	1
HU4.2	HU4	2
HU4.3	HU4	3
HU4.4	HU4	4
HU7.1	HU7	1
HA1.1	HA1	1, 2
HA5.1	HA5	1
HA6.1	HA6	1
HA7.1	HA7	1
HS1.1	HS1	1
HS6.1	HS6	1
HS7.1	HS7	1
HG1.1	HG1	1
HG7.1	HG7	1
SU1.1	SU1	1
SU3.1	SU2	1
SU4.1	SU3	2
SU4.2	SU3	1
SU5.1	SU4	1, 2, 3
SU6.1	SU5	1
SU6.2	SU5	2

HNP	NEI 99-01 Rev. 6	
EAL	**IC**	**Example EAL**
SU7.1	SU6	1, 2, 3
SU8.1	SU7	1, 2
SA1.1	SA1	1
SA3.1	SA2	1
SA6.1	SA5	1
SA9.1	SA9	1
SS1.1	SS1	1
SS2.1	SS8	1
SS6.1	SS5	1
SG1.1	SG1	1
SG1.2	SG8	1

7.0 ATTACHMENTS

7.1 Attachment 1, Emergency Action Level Technical Bases

7.2 Attachment 2, Fission Product Barrier Matrix and Basis

7.3 Attachment 3, Safe Operation & Shutdown Areas Tables R-3/H-2 Bases

Category R – Abnormal Rad Release / Rad Effluent

EAL Group: ANY (EALs in this category are applicable to any plant condition, hot or cold.)

Many EALs are based on actual or potential degradation of fission product barriers because of the elevated potential for offsite radioactivity release. Degradation of fission product barriers though is not always apparent via non-radiological symptoms. Therefore, direct indication of elevated radiological effluents or area radiation levels are appropriate symptoms for emergency classification.

At lower levels, abnormal radioactivity releases may be indicative of a failure of containment systems or precursors to more significant releases. At higher release rates, offsite radiological conditions may result which require offsite protective actions. Elevated area radiation levels in plant may also be indicative of the failure of containment systems or preclude access to plant vital equipment necessary to ensure plant safety.

Events of this category pertain to the following subcategories:

1. Radiological Effluent

   Direct indication of effluent radiation monitoring systems provides a rapid assessment mechanism to determine releases in excess of classifiable limits. Projected offsite doses, actual offsite field measurements or measured release rates via sampling indicate doses or dose rates above classifiable limits.

2. Irradiated Fuel Event

   Conditions indicative of a loss of adequate shielding or damage to irradiated fuel may preclude access to vital plant areas or result in radiological releases that warrant emergency classification.

3. Area Radiation Levels

   Sustained general area radiation levels which may preclude access to areas requiring continuous occupancy also warrant emergency classification.

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer

EAL:

RU1.1 Unusual Event

Reading on **any** Table R-1 effluent radiation monitor > column "UE" for ≥ 60 min. (Notes 1, 2, 3)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes.

Table R-1 Effluent Monitor Classification Thresholds

	Release Point	Monitor	GE	SAE	Alert	UE
Gaseous	Plant Vent	RM-21AV-3509-1SA	1.05E+8 µCi/sec	1.05E+7 µCi/sec	1.05E+6 µCi/sec	8.93E+3 µCi/sec
Gaseous	Turbine Building	RM-1TV-3536-1	4.60E+8 µCi/sec	4.60E+7 µCi/sec	4.60E+6 µCi/sec	1.08E+4 µCi/sec
Gaseous	Waste Process Building Vent 5	RM-1WV-3546-1	7.74E+9 µCi/sec	7.74E+8 µCi/sec	7.75E+7 µCi/sec	1.95E+5 µCi/sec
Gaseous	Waste Process Building Vent 5A	RM-1WV-3547-1	7.76E+9 µCi/sec	7.76E+8 µCi/sec	7.76E+7 µCi/sec	1.14E+4 µCi/sec
Liquid	Treated Laundry & Hot Shower Tank Discharge	REM-1WL-3540	---	---	---	1.83E+5 cpm
Liquid	Waste Monitor/Waste Evaporator Condensate Tank Discharge	REM-21WL-3541	---	---	---	5.13E+5 cpm
Liquid	Secondary Waste Sample Tank Discharge	REM-21WS-3542	---	---	---	1.83E+5 cpm

Mode Applicability:

All

Definition(s):

None

HNP Basis:

The column "UE" gaseous and liquid release values in Table R-1 represent two times the appropriate ODCM release rate limits associated with the specified monitors (ref. 1, 2).

The column "UE" liquid release values in Table R-1 represent two times the alarm setpoint of the specified monitors. The setpoints are established to ensure the ODCM release limits are not exceeded (ref. 1).

NEI 99-01 Basis:

This IC addresses a potential decrease in the level of safety of the plant as indicated by a low-level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or un-monitored, including those for which a radioactivity discharge permit is normally prepared.

Nuclear power plants incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.

This EAL addresses normally occurring continuous radioactivity releases from monitored gaseous or liquid effluent pathways.

Escalation of the emergency classification level would be via IC RA1.

HNP Basis Reference(s):

1. Shearon Harris Nuclear Power Plant Offsite Dose Calculation Manual (ODCM) Section 3.0, Gaseous Effluents
2. EP-EALCALC-HNP-1401, HNP Radiological Effluent EAL Values Rev. 0

3. NEI 99-01 AU1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer

EAL:

RU1.2 Unusual Event
Sample analysis for a gaseous or liquid release indicates a concentration or release rate > 2 x ODCM limits for ≥ 60 min. (Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Mode Applicability:

All

Definition(s):

None

HNP Basis:

Releases in excess of two times the site Offsite Dose Calculation Manual (ODCM) (ref. 1) instantaneous limits that continue for 60 minutes or longer represent an uncontrolled situation and hence, a potential degradation in the level of safety. The final integrated dose (which is very low in the Unusual Event emergency class) is not the primary concern here; it is the degradation in plant control implied by the fact that the release was not isolated within 60 minutes.

NEI 99-01 Basis:

This IC addresses a potential decrease in the level of safety of the plant as indicated by a low-level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or un-monitored, including those for which a radioactivity discharge permit is normally prepared.

Nuclear power plants incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.

This EAL addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys, particularly on unmonitored pathways (e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.).

Escalation of the emergency classification level would be via IC RA1.

HNP Basis Reference(s):

1. Shearon Harris Nuclear Power Plant Offsite Dose Calculation Manual (ODCM)
2. NEI 99-01 AU1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

EAL:

RA1.1 Alert

Reading on **any** Table R-1 effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes.

Note 4 The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values.

Table R-1 Effluent Monitor Classification Thresholds

	Release Point	Monitor	GE	SAE	Alert	UE
Gaseous	Plant Vent	RM-21AV-3509-1SA	1.05E+8 µCi/sec	1.05E+7 µCi/sec	1.05E+6 µCi/sec	8.93E+3 µCi/sec
Gaseous	Turbine Building	RM-1TV-3536-1	4.60E+8 µCi/sec	4.60E+7 µCi/sec	4.60E+6 µCi/sec	1.08E+4 µCi/sec
Gaseous	Waste Process Building Vent 5	RM-1WV-3546-1	7.74E+9 µCi/sec	7.74E+8 µCi/sec	7.75E+7 µCi/sec	1.95E+5 µCi/sec
Gaseous	Waste Process Building Vent 5A	RM-1WV-3547-1	7.76E+9 µCi/sec	7.76E+8 µCi/sec	7.76E+7 µCi/sec	1.14E+4 µCi/sec
Liquid	Treated Laundry & Hot Shower Tank Discharge	REM-1WL-3540	----	----	----	1.83E+5 cpm
Liquid	Waste Monitor/Waste Evaporator Condensate Tank Discharge	REM-21WL-3541	----	----	----	5.13E+5 cpm
Liquid	Secondary Waste Sample Tank Discharge	REM-21WS-3542	----	----	----	1.83E+5 cpm

Mode Applicability:

All

Definition(s):

None

HNP Basis:

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to site boundary doses that exceed either:

- 10 mRem TEDE
- 50 mRem CDE Thyroid

The column "ALERT" gaseous effluent release values in Table R-1 correspond to calculated doses of 1% (10% of the calculated SAE thresholds) of the EPA Protective Action Guidelines (TEDE or CDE Thyroid) (ref. 1).

NEI 99-01 Basis:

This IC addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the EPA PAG of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

Escalation of the emergency classification level would be via IC RS1.

HNP Basis Reference(s):

1. EP-EALCALC-HNP-1401, HNP Radiological Effluent EAL Values Rev. 0
2. NEI 99-01 AA1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

EAL:

RA1.2 Alert
Dose assessment using actual meteorology indicates doses > 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4)

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values.

Mode Applicability:

All

Definition(s):

SITE BOUNDARY - A circle of approximately 2500 ft. radius from the center of the containment building (0.47 miles).

HNP Basis:

Dose assessments are performed by computer-based methods (ref. 1)

NEI 99-01 Basis:

This IC addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and

conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the EPA PAG of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

Escalation of the emergency classification level would be via IC RS1.

HNP Basis Reference(s):

1. AD-EP-ALL-0202, Emergency Response Offsite Dose Assessment
2. NEI 99-01 AA1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

EAL:

RA1.3 Alert

Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Mode Applicability:

All

Definition(s):

SITE BOUNDARY - A circle of approximately 2500 ft. radius from the center of the containment building (0.47 miles).

HNP Basis:

Dose assessments based on liquid releases are performed per Offsite Dose Calculation Manual (ref. 1).

NEI 99-01 Basis:

This IC addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions

alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the EPA PAG of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

Escalation of the emergency classification level would be via IC RS1.

HNP Basis Reference(s):

1. Shearon Harris Nuclear Power Plant Offsite Dose Calculation Manual (ODCM)

2. NEI 99-01 AA1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

EAL:

RA1.4 Alert

Field survey results indicate **EITHER** of the following at or beyond the SITE BOUNDARY:

- Closed window dose rates > 10 mR/hr expected to continue for ≥ 60 min.
- Analyses of field survey samples indicate thyroid CDE > 50 mrem for 60 min. of inhalation.

(Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Mode Applicability:

All

Definition(s):

SITE BOUNDARY - A circle of approximately 2500 ft. radius from the center of the containment building (0.47 miles).

HNP Basis:

PEP-270, Activation and Operation of the Emergency Operations Facility and PEP-330, Radiological Consequences provide guidance for emergency or post-accident radiological environmental monitoring (ref. 1, 2).

NEI 99-01 Basis:

This IC addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a

radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the EPA PAG of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

Escalation of the emergency classification level would be via IC RS1.

HNP Basis Reference(s):

1. PEP-270, Activation and Operation of the Emergency Operations Facility
2. PEP-330, Radiological Consequences
3. NEI 99-01 AA1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

EAL:

RS1.1 Site Area Emergency

Reading on **any** Table R-1 effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values.

Table R-1 Effluent Monitor Classification Thresholds

	Release Point	Monitor	GE	SAE	Alert	UE
Gaseous	Plant Vent	RM-21AV-3509-1SA	1.05E+8 µCi/sec	1.05E+7 µCi/sec	1.05E+6 µCi/sec	8.93E+3 µCi/sec
Gaseous	Turbine Building	RM-1TV-3536-1	4.60E+8 µCi/sec	4.60E+7 µCi/sec	4.60E+6 µCi/sec	1.08E+4 µCi/sec
Gaseous	Waste Process Building Vent 5	RM-1WV-3546-1	7.74E+9 µCi/sec	7.74E+8 µCi/sec	7.75E+7 µCi/sec	1.95E+5 µCi/sec
Gaseous	Waste Process Building Vent 5A	RM-1WV-3547-1	7.76E+9 µCi/sec	7.76E+8 µCi/sec	7.76E+7 µCi/sec	1.14E+4 µCi/sec
Liquid	Treated Laundry & Hot Shower Tank Discharge	REM-1WL-3540	---	---	---	1.83E+5 cpm
Liquid	Waste Monitor/Waste Evaporator Condensate Tank Discharge	REM-21WL-3541	---	---	---	5.13E+5 cpm
Liquid	Secondary Waste Sample Tank Discharge	REM-21WS-3542	---	---	---	1.83E+5 cpm

Mode Applicability:

All

Definition(s):

None

HNP Basis:

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to site boundary doses that exceed either:

- 100 mRem TEDE
- 500 mRem CDE Thyroid

The column "SAE" gaseous effluent release value in Table R-1 corresponds to calculated doses of 10% of the EPA Protective Action Guidelines (TEDE or CDE Thyroid) (ref. 1).

NEI 99-01 Basis:

This IC addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the EPA PAG of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

Escalation of the emergency classification level would be via IC RG1.

HNP Basis Reference(s):

1. EP-EALCALC-HNP-1401, HNP Radiological Effluent EAL Values Rev. 0
2. NEI 99-01 AS1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

EAL:

RS1.2	**Site Area Emergency**
Dose assessment using actual meteorology indicates doses > 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4)	

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values.

Mode Applicability:

All

Definition(s):

SITE BOUNDARY - A circle of approximately 2500 ft. radius from the center of the containment building (0.47 miles).

HNP Basis:

Dose assessments are performed by computer-based methods (ref. 1)

NEI 99-01 Basis:

This IC addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the EPA PAG of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

Escalation of the emergency classification level would be via IC RG1.

HNP Basis Reference(s):

1. AD-EP-ALL-0202, Emergency Response Offsite Dose Assessment
2. NEI 99-01 AS1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

EAL:

RS1.3 Site Area Emergency

Field survey results indicate **EITHER** of the following at or beyond the SITE BOUNDARY:

- Closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min.
- Analyses of field survey samples indicate thyroid CDE > 500 mrem for 60 min. of inhalation.

(Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Mode Applicability:

All

Definition(s):

SITE BOUNDARY - A circle of approximately 2500 ft. radius from the center of the containment building (0.47 miles).

HNP Basis:

PEP-270, Activation and Operation of the Emergency Operations Facility and PEP-330, Radiological Consequences provide guidance for emergency or post-accident radiological environmental monitoring (ref. 1, 2).

NEI 99-01Basis:

This IC addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the EPA PAG of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Escalation of the emergency classification level would be via IC RG1.

HNP Basis Reference(s):

1. PEP-270, Activation and Operation of the Emergency Operations Facility
2. PEP-330, Radiological Consequences
3. NEI 99-01 AS1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE

EAL:

RG1.1 General Emergency

Reading on **any** Table R-1 effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values.

Table R-1 Effluent Monitor Classification Thresholds

	Release Point	Monitor	GE	SAE	Alert	UE
Gaseous	Plant Vent	RM-21AV-3509-1SA	1.05E+8 µCi/sec	1.05E+7 µCi/sec	1.05E+6 µCi/sec	8.93E+3 µCi/sec
Gaseous	Turbine Building	RM-1TV-3536-1	4.60E+8 µCi/sec	4.60E+7 µCi/sec	4.60E+6 µCi/sec	1.08E+4 µCi/sec
Gaseous	Waste Process Building Vent 5	RM-1WV-3546-1	7.74E+9 µCi/sec	7.74E+8 µCi/sec	7.75E+7 µCi/sec	1.95E+5 µCi/sec
Gaseous	Waste Process Building Vent 5A	RM-1WV-3547-1	7.76E+9 µCi/sec	7.76E+8 µCi/sec	7.76E+7 µCi/sec	1.14E+4 µCi/sec
Liquid	Treated Laundry & Hot Shower Tank Discharge	REM-1WL-3540	---	---	---	1.83E+5 cpm
Liquid	Waste Monitor/Waste Evaporator Condensate Tank Discharge	REM-21WL-3541	---	---	---	5.13E+5 cpm
Liquid	Secondary Waste Sample Tank Discharge	REM-21WS-3542	---	---	---	1.83E+5 cpm

Mode Applicability:

All

Definition(s):

None

HNP Basis:

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to site boundary doses that exceed either:

- 1000 mRem TEDE
- 5000 mRem CDE Thyroid

The column "GE" gaseous effluent release values in Table R-1 correspond to calculated doses of 100% of the EPA Protective Action Guidelines (TEDE or CDE Thyroid) (ref. 1).

NEI 99-01Basis:

This IC addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the EPA PAG of 1,000 mrem while the 5,000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

HNP Basis Reference(s):

1. EP-EALCALC-HNP-1401, HNP Radiological Effluent EAL Values Rev. 0
2. NEI 99-01 AG1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE

EAL:

RG1.2 General Emergency
Dose assessment using actual meteorology indicates doses > 1,000 mrem TEDE or 5,000 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4)

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **no** longer VALID for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values.

Mode Applicability:

All

Definition(s):

SITE BOUNDARY - A circle of approximately 2500 ft. radius from the center of the containment building (0.47 miles).

HNP Basis:

Dose assessments are performed by computer-based methods (ref. 1)

NEI 99-01 Basis:

This IC addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the EPA PAG of 1,000 mrem while the 5,000 mrem thyroid CDE was

established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

HNP Basis Reference(s):

1. AD-EP-ALL-0202, Emergency Response Offsite Dose Assessment
2. NEI 99-01 AG1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 1 – Radiological Effluent

Initiating Condition: Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE

EAL:

RG1.3 General Emergency

Field survey results indicate EITHER of the following at or beyond the SITE BOUNDARY:

- Closed window dose rates > 1,000 mR/hr expected to continue for ≥ 60 min.
- Analyses of field survey samples indicate thyroid CDE > 5,000 mrem for 60 min. of inhalation.

(Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Mode Applicability:

All

Definition(s):

SITE BOUNDARY - A circle of approximately 2500 ft. radius from the center of the containment building (0.47 miles).

HNP Basis:

PEP-270, Activation and Operation of the Emergency Operations Facility and PEP-330, Radiological Consequences provide guidance for emergency or post-accident radiological environmental monitoring (ref. 1, 2).

NEI 99-01 Basis:

This IC addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the EPA PAG of 1,000 mrem while the 5,000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

HNP **Basis Reference(s):**

1. PEP-270, Activation and Operation of the Emergency Operations Facility
2. PEP-330, Radiological Consequences
3. NEI 99-01 AG1

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 2 – Irradiated Fuel Event

Initiating Condition: Unplanned loss of water level above irradiated fuel

EAL:

RU2.1 Unusual Event

UNPLANNED water level drop in the REFUELING PATHWAY as indicated by low water level alarm or indication

AND

UNPLANNED rise in corresponding area radiation levels as indicated by **any** Table R-2 area radiation monitors

Table R-2 Refueling Pathway Area Radiation Monitors

Containment

- RM-1CR-3561A-SA Containment Ventilation Isolation
- RM-1CR-3561B-SB Containment Ventilation Isolation
- RM-1CR-3561C-SA Containment Ventilation Isolation
- RM-1CR-3561D-SB Containment Ventilation Isolation

Fuel Handling Building

- RM-1FR-3564A-SA Spent Fuel Pool SW, SE, SW
- RM-1FR-3564B-SB Spent Fuel Pool SW, SE, SE
- RM-1FR-3565A-SA Spent Fuel Pool SW, SE, SW
- RM-1FR-3565B-SB Spent Fuel Pool SW, SE, SE
- RM-1FR-3566A-SA Spent Fuel Pool NE, NW, NE
- RM-1FR-3566B-SB Spent Fuel Pool NW, NE, NW
- RM-1FR-3567A-SA Spent Fuel Pool NW, NE, NW
- RM-1FR-3567B-SB Spent Fuel Pool NE, NW, NE

Mode Applicability:

All

Definition(s):

UNPLANNED - A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

REFUELING PATHWAY - The reactor refueling cavity, spent fuel pool and fuel transfer canal comprise the refueling pathway.

HNP Basis:

The spent fuel pool low water level alarm setpoint is actuated at a setpoint of 284 ft. (ref. 1, 2, 3). Water level restoration instructions are performed in accordance with AOPs (ref. 4, 5).

The specified radiation monitors are those expected to see increase area radiation levels as a result of a loss of REFUELING PATHWAY inventory (ref. 4, 5, 6). Increasing radiation indications on these monitors in the absence of indications of decreasing REFUELING CAVITY level are not classifiable under this EAL.

When the spent fuel pool and reactor cavity are connected, there could exist the possibility of uncovering irradiated fuel. Therefore, this EAL is applicable for conditions in which irradiated fuel is being transferred to and from the reactor vessel and spent fuel pool.

NEI 99-01 Basis:

This IC addresses a decrease in water level above irradiated fuel sufficient to cause elevated radiation levels. This condition could be a precursor to a more serious event and is also indicative of a minor loss in the ability to control radiation levels within the plant. It is therefore a potential degradation in the level of safety of the plant.

A water level decrease will be primarily determined by indications from available level instrumentation. Other sources of level indications may include reports from plant personnel (e.g., from a refueling crew) or video camera observations (if available). A significant drop in the water level may also cause an increase in the radiation levels of adjacent areas that can be detected by monitors in those locations.

The effects of planned evolutions should be considered. For example, a refueling bridge area radiation monitor reading may increase due to planned evolutions such as lifting of the reactor vessel head or movement of a fuel assembly. Note that this EAL is applicable only in cases where the elevated reading is due to an unplanned loss of water level.

A drop in water level above irradiated fuel within the reactor vessel may be classified in accordance Recognition Category C during the Cold Shutdown and Refueling modes.

Escalation of the emergency classification level would be via IC RA2.

HNP Basis Reference(s):

1. APP-ALB-023-4-17, SPENT FP HI/LO LEVEL
2. APP-ALB-023-4-18, SFP C HI/LO LEVEL
3. APP-ALB-023-5-18, SFP D HI/LO LEVEL
4. AOP-013, Fuel Handling Accident

5. AOP-031, Loss of Refueling Cavity Integrity
6. AOP-005, Radiation Monitoring System
7. NEI 99-01 AU2

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 2 – Irradiated Fuel Event

Initiating Condition: Significant lowering of water level above, or damage to, irradiated fuel

EAL:

RA2.1 Unusual Event
Uncovery of irradiated fuel in the REFUELING PATHWAY

Mode Applicability:

All

Definition(s):

REFUELING PATHWAY- The reactor refueling cavity, spent fuel pool and fuel transfer canal comprise the refueling pathway.

HNP Basis:

None.

NEI 99-01 Basis:

This IC addresses events that have caused imminent or actual damage to an irradiated fuel assembly, or a significant lowering of water level within the spent fuel pool. These events present radiological safety challenges to plant personnel and are precursors to a release of radioactivity to the environment. As such, they represent an actual or potential substantial degradation of the level of safety of the plant.

This EAL escalates from RU2.1 in that the loss of level, in the affected portion of the REFUELING PATHWAY, is of sufficient magnitude to have resulted in uncovery of irradiated fuel. Indications of irradiated fuel uncovery may include direct or indirect visual observation (e.g., reports from personnel or camera images), as well as significant changes in water and radiation levels, or other plant parameters. Computational aids may also be used (e.g., a boil-off curve). Classification of an event using this EAL should be based on the totality of available indications, reports and observations.

While an area radiation monitor could detect an increase in a dose rate due to a lowering of water level in some portion of the REFUELING PATHWAY, the reading may not be a reliable indication of whether or not the fuel is actually uncovered. To the degree possible, readings should be considered in combination with other available indications of inventory loss.

A drop in water level above irradiated fuel within the reactor vessel may be classified in accordance Recognition Category C during the Cold Shutdown and Refueling modes.

Escalation of the emergency classification level would be via IC RS1.

HNP Basis Reference(s):

1. AOP-013, Fuel Handling Accident
2. AOP-031, Loss of Refueling Cavity Integrity
3. NEI 99-01 AA2

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 2 – Irradiated Fuel Event

Initiating Condition: Significant lowering of water level above, or damage to, irradiated fuel

EAL:

RA2.2 Alert

Damage to irradiated fuel resulting in a release of radioactivity

AND

A high alarm on **any** of the following:

- Table R-2 refueling pathway area radiation monitors
- REM-*1FL-3508A-SA, FHB Emergency Exhaust
- REM-*1FL-3508B-SB, FHB Emergency Exhaust

Table R-2 Refueling Pathway Area Radiation Monitors

Containment

- RM-1CR-3561A-SA Containment Ventilation Isolation
- RM-1CR-3561B-SB Containment Ventilation Isolation
- RM-1CR-3561C-SA Containment Ventilation Isolation
- RM-1CR-3561D-SB Containment Ventilation Isolation

Fuel Handling Building

- RM-1FR-3564A-SA Spent Fuel Pool SW, SE, SW
- RM-1FR-3564B-SB Spent Fuel Pool SW, SE, SE
- RM-1FR-3565A-SA Spent Fuel Pool SW, SE, SW
- RM-1FR-3565B-SB Spent Fuel Pool SW, SE, SE
- RM-1FR-3566A-SA Spent Fuel Pool NE, NW, NE
- RM-1FR-3566B-SB Spent Fuel Pool NW, NE, NW
- RM-1FR-3567A-SA Spent Fuel Pool NW, NE, NW
- RM-1FR-3567B-SB Spent Fuel Pool NE, NW, NE

Mode Applicability:

All

Definition(s):

None

HNP Basis:

The specified radiation monitors are those expected to see increase area radiation levels as a result of damage to irradiated fuel (ref. 1, 2, 3).

The high alarm setpoints for the radiation monitors are set to be indicative of significant increases in area and/or airborne radiation (ref. 4, 5).

NEI 99-01 Basis:

This IC addresses events that have caused imminent or actual damage to an irradiated fuel assembly, or a significant lowering of water level within the spent fuel pool. These events present radiological safety challenges to plant personnel and are precursors to a release of radioactivity to the environment. As such, they represent an actual or potential substantial degradation of the level of safety of the plant.

Escalation of the emergency would be based on either Recognition Category R or C ICs.

This EAL addresses a release of radioactive material caused by mechanical damage to irradiated fuel. Damaging events may include the dropping, bumping or binding of an assembly, or dropping a heavy load onto an assembly. A rise in readings on radiation monitors should be considered in conjunction with in-plant reports or observations of a potential fuel damaging event (e.g., a fuel handling accident).

Escalation of the emergency classification level would be via IC RS1.

HNP Basis Reference(s):

1. AOP-013, Fuel Handling Accident
2. AOP-031, Loss of Refueling Cavity Integrity
3. AOP-005, Radiation Monitoring System
4. DBD-304, Radiation Monitoring System & Gross Failed Fuel Detector
5. HPP-500, Radiation Monitoring System Data Base Manual
6. NEI 99-01 AA2

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 2 – Irradiated Fuel Event

Initiating Condition: Significant lowering of water level above, or damage to, irradiated fuel

EAL:

RA2.3 Alert
Lowering of spent fuel pool level ≤ 270.7 ft. (Level 2)

Mode Applicability:

All

Definition(s):

None

HNP Basis:

Post-Fukushima order EA-12-051 (ref.1) required the installation of reliable SFP level indication capable of identifying normal level (Level 1), SFP level 10 ft. above the top of the fuel racks (Level 2) and SFP level at the top of the fuel racks (Level 3).

The SFP level instruments consist of a three independent remote indicating channels (LI-5101A, LI-5102A and LI-5103A) each spanning approximately 25 ft. (260 ft. – 285 ft. indicated). Level 2 corresponds to an indicated SFP level of 270.7 ft. or approximately 10 ft. above the top of the SFP racks (ref. 2).

NEI 99-01 Basis:

This IC addresses events that have caused imminent or actual damage to an irradiated fuel assembly, or a significant lowering of water level within the spent fuel pool. These events present radiological safety challenges to plant personnel and are precursors to a release of radioactivity to the environment. As such, they represent an actual or potential substantial degradation of the level of safety of the plant.

Escalation of the emergency would be based on either Recognition Category R or C ICs.

Spent fuel pool water level at this value is within the lower end of the level range necessary to prevent significant dose consequences from direct gamma radiation to personnel performing operations in the vicinity of the spent fuel pool. This condition reflects a significant loss of spent fuel pool water inventory and thus it is also a precursor to a loss of the ability to adequately cool the irradiated fuel assembles stored in the pool.

Escalation of the emergency classification level would be via IC RS1.

HNP Basis Reference(s):

1. NRC EA-12-051, Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation
2. EC 89579
3. NEI 99-01 AA2

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 2 – Irradiated Fuel Event

Initiating Condition: Spent fuel pool level at the top of the fuel racks

EAL:

RS2.1 Site Area Emergency
Lowering of spent fuel pool level ≤ 260.7 ft. (Level 3)

Mode Applicability:

All

Definition(s):

None

HNP Basis:

Post-Fukushima order EA-12-051 (ref.1) required the installation of reliable SFP level indication capable of identifying normal level (Level 1), SFP level 10 ft. above the top of the fuel racks (Level 2) and SFP level at the top of the fuel racks (Level 3).

The SFP level instruments consist of a three independent remote indicating channels (LI-5101A, LI-5102A and LI-5103A) each spanning approximately 25 ft. (260 ft. – 285 ft. indicated). Level 3 corresponds to an indicated SFP level of 260.7 ft. which is the top of the SFP racks (ref. 2).

NEI 99-01 Basis:

This EAL addresses a significant loss of spent fuel pool inventory control and makeup capability leading to IMMINENT fuel damage. This condition entails major failures of plant functions needed for protection of the public and thus warrant a Site Area Emergency declaration.

It is recognized that this IC would likely not be met until well after another Site Area Emergency IC was met; however, it is included to provide classification diversity.

Escalation of the emergency classification level would be via IC RG1 or RG2.

HNP Basis Reference(s):

1. NRC EA-12-051, Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation
2. EC 89579
3. NEI 99-01 AS2

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 2 – Irradiated Fuel Event

Initiating Condition: Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer

EAL:

RG2.1 General Emergency
Spent fuel pool level cannot be restored to at least 260.7 ft. (Level 3) for ≥ 60 min. (Note 1)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Mode Applicability:

All

Definition(s):

None

HNP Basis:

Post-Fukushima order EA-12-051 (ref.1) required the installation of reliable SFP level indication capable of identifying normal level (Level 1), SFP level 10 ft. above the top of the fuel racks (Level 2) and SFP level at the top of the fuel racks (Level 3).

The SFP level instruments consist of a three independent remote indicating channels (LI-5101A, LI-5102A and LI-5103A) each spanning approximately 25 ft. (260 ft. – 285 ft. indicated). Level 3 corresponds to an indicated SFP level of 260.7 ft. which is the top of the SFP racks (ref. 2).

NEI 99-01 Basis:

This EAL addresses a significant loss of spent fuel pool inventory control and makeup capability leading to a prolonged uncovery of spent fuel. This condition will lead to fuel damage and a radiological release to the environment.

It is recognized that this IC would likely not be met until well after another General Emergency IC was met; however, it is included to provide classification diversity.

HNP Basis Reference(s):

1. NRC EA-12-051, Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation
2. EC 89579
3. NEI 99-01 AG2

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 3 – Area Radiation Levels

Initiating Condition: Radiation levels that IMPEDE access to equipment necessary for normal plant operations, cooldown or shutdown

EAL:

RA3.1 Alert

Dose rates > 15 mR/hr in **EITHER** of the following areas:

Control Room (RM-21RR-3560-SA)

OR

Central Alarm Station (by survey)

Mode Applicability:

All

Definition(s):

IMPEDE(D) - Personnel access to a room or area is hindered to an extent that extraordinary measures are necessary to facilitate entry of personnel into the affected room/area (e.g., requiring use of protective equipment, such as SCBAs, that is not routinely employed).

HNP Basis:

Areas that meet this threshold include the Control Room and the Central Alarm Station (CAS). RM-21RR-3560-SA monitors the Control room for area radiation (ref. 1, 2). The CAS is included in this EAL because of its' importance to permitting access to areas required to assure safe plant operations.

There is no permanently installed CAS area radiation monitors that may be used to assess this EAL threshold. Therefore this threshold must be assessed via local radiation survey for the CAS.

NEI 99-01 Basis:

This IC addresses elevated radiation levels in certain plant rooms/areas sufficient to preclude or impede personnel from performing actions necessary to maintain normal plant operation, or to perform a normal plant cooldown and shutdown. As such, it represents an actual or potential substantial degradation of the level of safety of the plant. The Emergency

Coordinator should consider the cause of the increased radiation levels and determine if another IC may be applicable.

Escalation of the emergency classification level would be via Recognition Category R, C or F ICs.

HNP Basis Reference(s):

1. HPP-500, Radiation Monitoring System Data Base Manual
2. DBD-304, Radiation Monitoring System & Gross Failed Fuel Detector
3. NEI 99-01 AA3

Category: R – Abnormal Rad Levels / Rad Effluent

Subcategory: 3 – Area Radiation Levels

Initiating Condition: Radiation levels that IMPEDE access to equipment necessary for normal plant operations, cooldown or shutdown

EAL:

RA3.2 Alert

An UNPLANNED event results in radiation levels that prohibit or impede access to **any** Table R-3/H-2 rooms or areas (Note 5)

Note 5: If the equipment in the listed room or area was already inoperable or out-of-service before the event occurred, then **no** emergency classification is warranted.

Table R-3/H-2 Safe Operation & Shutdown Rooms/Areas	
Room/Area	**Mode(s)**
RAB 190 (RHR pumps)	4
RAB 216 (BIT)	1, 2, 3, 4, 5
RAB 236 (CSIP, Primary Sample Sink, AFW pumps, CCW pumps and HX, Boric Acid Transfer Pumps, Mezzanine Area)	1, 2, 3, 4, 5
RAB 261 (RHR Heat Exchangers, Demin. Valve Gallery, VCT Valve Gallery)	1, 2, 3, 4, 5
RAB 286 (Switchgear)	3,4,5
Containment Building	3
Steam Tunnel	1, 2, 3, 4
ESW intakes	1, 2, 3, 4, 5

Mode Applicability:

All

Definition(s):

IMPEDE(D) - Personnel access to a room or area is hindered to an extent that extraordinary measures are necessary to facilitate entry of personnel into the affected room/area (e.g., requiring use of protective equipment, such as SCBAs, that is not routinely employed).

UNPLANNED - A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

HNP Basis:

If the equipment in the listed room or area was already inoperable, or out-of-service, before the event occurred, then no emergency should be declared since the event will have no adverse impact beyond that already allowed by Technical Specifications at the time of the event.

The list of plant rooms or areas with entry-related mode applicability identified specify those rooms or areas that contain equipment which require a manual/local action as specified in operating procedures used for normal plant operation, cooldown and shutdown. Rooms or areas in which actions of a contingent or emergency nature would be performed (e.g., an action to address an off-normal or emergency condition such as emergency repairs, corrective measures or emergency operations) are not included. In addition, the list specifies the plant mode(s) during which entry would be required for each room or area (ref. 1).

NEI 99-01 Basis:

This IC addresses elevated radiation levels in certain plant rooms/areas sufficient to preclude or impede personnel from performing actions necessary to maintain normal plant operation, or to perform a normal plant cooldown and shutdown. As such, it represents an actual or potential substantial degradation of the level of safety of the plant. The Emergency Coordinator should consider the cause of the increased radiation levels and determine if another IC may be applicable.

For RA3.2, an Alert declaration is warranted if entry into the affected room/area is, or may be, procedurally required during the plant operating mode in effect at the time of the elevated radiation levels. The emergency classification is not contingent upon whether entry is actually necessary at the time of the increased radiation levels. Access should be considered as impeded if extraordinary measures are necessary to facilitate entry of personnel into the affected room/area (e.g., installing temporary shielding, requiring use of non-routine protective equipment, requesting an extension in dose limits beyond normal administrative limits).

An emergency declaration is not warranted if any of the following conditions apply:

- The plant is in an operating mode different than the mode specified for the affected room/area (i.e., entry is not required during the operating mode in effect at the time of the elevated radiation levels). For example, the plant is in Mode 1 when the radiation increase occurs, and the procedures used for normal operation, cooldown and shutdown do not require entry into the affected room until Mode 4.

- The increased radiation levels are a result of a planned activity that includes compensatory measures which address the temporary inaccessibility of a room or area (e.g., radiography, spent filter or resin transfer, etc.).

- The action for which room/area entry is required is of an administrative or record keeping nature (e.g., normal rounds or routine inspections).

- The access control measures are of a conservative or precautionary nature, and would not actually prevent or impede a required action.

If the equipment in the listed room or area was already inoperable, or out-of-service, before the event occurred, then no emergency should be declared since the event will have no adverse impact beyond that already allowed by Technical Specifications at the time of the event.

Escalation of the emergency classification level would be via Recognition Category R, C or F ICs.

HNP Basis Reference(s):

1. Attachment 3, Safe Operation & Shutdown Rooms/Areas Tables R-3/H-2 Bases

2. NEI 99-01 AA3

Category C – Cold Shutdown / Refueling System Malfunction

EAL Group: Cold Conditions (RCS temperature ≤ 200°F); EALs in this category are applicable only in one or more cold operating modes.

Category C EALs are directly associated with cold shutdown or refueling system safety functions. Given the variability of plant configurations (e.g., systems out-of-service for maintenance, containment open, reduced AC power redundancy, time since shutdown) during these periods, the consequences of any given initiating event can vary greatly. For example, a loss of decay heat removal capability that occurs at the end of an extended outage has less significance than a similar loss occurring during the first week after shutdown. Compounding these events is the likelihood that instrumentation necessary for assessment may also be inoperable. The cold shutdown and refueling system malfunction EALs are based on performance capability to the extent possible with consideration given to RCS integrity, containment closure, and fuel clad integrity for the applicable operating modes (5 - Cold Shutdown, 6 - Refueling, D – Defueled).

The events of this category pertain to the following subcategories:

1. RCS Level

Reactor Vessel or RCS water level is directly related to the status of adequate core cooling and, therefore, fuel clad integrity.

2. Loss of Emergency AC Power

Loss of emergency plant electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity. This category includes loss of onsite and offsite power sources for 6.9 KV safeguard buses.

3. RCS Temperature

Uncontrolled or inadvertent temperature or pressure increases are indicative of a potential loss of safety functions.

4. Loss of Vital DC Power

Loss of emergency plant electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity. This category includes loss of power to or degraded voltage on the 125 VDC safeguard buses.

5. Loss of Communications

Certain events that degrade plant operator ability to effectively communicate with essential personnel within or external to the plant warrant emergency classification.

6. Hazardous Event Affecting Safety Systems

Certain hazardous natural and technological events may result in visible damage to or degraded performance of safety systems warranting classification.

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: UNPLANNED loss of RCS inventory for 15 minutes or longer

EAL:

CU1.1 Unusual Event
UNPLANNED loss of reactor coolant results in RCS water level less than a required lower limit for ≥ 15 min. (Note 1)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Mode Applicability:

5 - Cold Shutdown, 6 - Refueling

Definition(s):

UNPLANNED - A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

HNP Basis:

RCS water level less than a required lower limit is meant to be less than the lower end of the level control band being procedurally maintained for the current condition or evolution.

With the plant in Cold Shutdown, RCS water level is normally maintained above the pressurizer low level setpoint of 17% (ref. 1, 2). However, if RCS level is being controlled below the pressurizer low level setpoint, or if level is being maintained in a designated band in the reactor vessel it is the inability to maintain level above the low end of the designated control band due to a loss of inventory resulting from a leak in the RCS that is the concern.

With the plant in Refueling mode, RCS water level is normally maintained at or above the reactor vessel flange (ref. 2, 3, 4).

NEI 99-01 Basis:

This IC addresses the inability to restore and maintain water level to a required minimum level (or the lower limit of a level band), or a loss of the ability to monitor RCS level concurrent with indications of coolant leakage. Either of these conditions is considered to be a potential degradation of the level of safety of the plant.

Refueling evolutions that decrease RCS water inventory are carefully planned and controlled. An UNPLANNED event that results in water level decreasing below a procedurally required

limit warrants the declaration of an Unusual Event due to the reduced water inventory that is available to keep the core covered.

This EAL recognizes that the minimum required RCS level can change several times during the course of a refueling outage as different plant configurations and system lineups are implemented. This EAL is met if the minimum level, specified for the current plant conditions, cannot be maintained for 15 minutes or longer. The minimum level is typically specified in the applicable operating procedure but may be specified in another controlling document.

The 15-minute threshold duration allows sufficient time for prompt operator actions to restore and maintain the expected water level. This criterion excludes transient conditions causing a brief lowering of water level.

Continued loss of RCS inventory may result in escalation to the Alert emergency classification level via either IC CA1 or CA3.

HNP Basis Reference(s):

1. APP-ALB-009, Main Control Board
2. GP-001, Reactor Coolant System Fill and Vent Mode 5
3. GP-008, Draining the Reactor Coolant System
4. GP-009, Refueling Cavity Fill, Refueling and Drain of the Refueling Cavity Modes 5-6-5
5. NEI 99-01 CU1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: UNPLANNED loss of RCS inventory for 15 minutes or longer

EAL:

CU1.2 Unusual Event

RCS water level cannot be monitored

AND EITHER

- UNPLANNED increase in **any** Table C-1 sump or tank due to a loss of RCS inventory
- Visual observation of UNISOLABLE RCS leakage

Table C-1 Sumps / Tanks
• Containment sumps • PRT • RCDT • CCW surge tank • RAB sumps • RWST • RMWST • Recycle Holdup Tank

Mode Applicability:

5 - Cold Shutdown, 6 – Refueling

Definition(s):

UNISOLABLE - An open or breached system line that cannot be isolated, remotely or locally.

UNPLANNED - A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

HNP Basis:

In Cold Shutdown mode, the RCS will normally be intact and standard RCS level monitoring means are available. RCS level in the Refueling mode is normally monitored using the standpipe.

In this EAL, all water level indication is unavailable and the RCS inventory loss must be detected by indirect leakage indications. 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. If the make-up rate to the RCS unexplainably rises above the pre-established rate, a loss of RCS inventory may be occurring even if the source of the leakage cannot be immediately identified. Sumps and tanks where RCS leakage may accumulate are listed in listed in Table C-1. Visual observation of leakage from systems connected to the RCS that cannot be isolated could also be indicative of a loss of RCS inventory (ref. 1, 2).

NEI 99-01 Basis:

This IC addresses the inability to restore and maintain water level to a required minimum level (or the lower limit of a level band), or a loss of the ability to monitor RCS level concurrent with indications of coolant leakage. Either of these conditions is considered to be a potential degradation of the level of safety of the plant.

Refueling evolutions that decrease RCS water inventory are carefully planned and controlled. An UNPLANNED event that results in water level decreasing below a procedurally required limit warrants the declaration of an Unusual Event due to the reduced water inventory that is available to keep the core covered.

This EAL addresses a condition where all means to determine RPV level have been lost. In this condition, operators may determine that an inventory loss is occurring by observing changes in sump and/or tank levels. Sump and/or tank level changes must be evaluated against other potential sources of water flow to ensure they are indicative of leakage from the RCS.

Continued loss of RCS inventory may result in escalation to the Alert emergency classification level via either IC CA1 or CA3.

HNP Basis Reference(s):

1. GP-001, Reactor Coolant System Fill and Vent Mode 5
2. GP-008, Draining the Reactor Coolant System
3. GP-009, Refueling Cavity Fill, Refueling and Drain of the Refueling Cavity Modes 5-6-5
4. NEI 99-01 CU1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: Loss of RCS inventory

EAL:

CA1.1 Alert
Loss of RCS inventory as indicated by LI-403 or RCS standpipe level < - 82 in.

Mode Applicability:

5 - Cold Shutdown, 6 – Refueling

Definition(s):

None

HNP Basis:

LI-403 or RCS standpipe level of - 82" corresponds to the minimum RCS level for continued RHR pump operation (ref. 1, 2, 3).

NEI 99-01 Basis:

This IC addresses conditions that are precursors to a loss of the ability to adequately cool irradiated fuel (i.e., a precursor to a challenge to the fuel clad barrier). This condition represents a potential substantial reduction in the level of plant safety.

For this EAL, a lowering of RCS water level below 82" below the reactor vessel flange indicates that operator actions have not been successful in restoring and maintaining RCS water level. The heat-up rate of the coolant will increase as the available water inventory is reduced. A continuing decrease in water level will lead to core uncovery.

Although related, this EAL is concerned with the loss of RCS inventory and not the potential concurrent effects on systems needed for decay heat removal (e.g., loss of a Residual Heat Removal suction point). An increase in RCS temperature caused by a loss of decay heat removal capability is evaluated under IC CA3.

If the RCS inventory water level continues to lower, then escalation to Site Area Emergency would be via IC CS1.

HNP Basis Reference(s):

1. GP-008, Draining the Reactor Coolant System
2. AOP-20, Loss of RCS Inventory or Residual Heat Removal While Shutdown

3. AOP-20, Loss of RCS Inventory or Residual Heat Removal While Shutdown – Basis Document
4. NEI 99-01 CA1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: Loss of RCS inventory

EAL:

CA1.2 Alert

RCS water level cannot be monitored for ≥ 15 min. (Note 1)

AND EITHER

- UNPLANNED increase in **any** Table C-1 sump or tank due to a loss of RCS inventory
- Visual observation of UNISOLABLE RCS leakage

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Table C-1 Sumps / Tanks
• Containment sumps • PRT • RCDT • CCW surge tank • RAB sumps • RWST • RMWST • Recycle Holdup Tank

Mode Applicability:

5 - Cold Shutdown, 6 – Refueling

Definition(s):

UNISOLABLE - An open or breached system line that cannot be isolated, remotely or locally.

UNPLANNED - A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

HNP Basis:

In Cold Shutdown mode, the RCS will normally be intact and standard RPV level monitoring means are available. In the Refuel mode, the RCS is not intact and RPV level may be monitored by different means, including the ability to monitor level visually.

In this EAL, all RCS water level indication would be unavailable for greater than 15 minutes, and the RCS inventory loss must be detected by indirect leakage indications. Sump level increases must be evaluated against other potential sources of leakage. If the make-up rate to the RCS unexplainably rises above the pre-established rate, a loss of RCS inventory may be occurring even if the source of the leakage cannot be immediately identified. Sumps and tanks where RCS leakage may accumulate are listed in listed in Table C-1. Visual observation of leakage from systems connected to the RCS that cannot be isolated could also be indicative of a loss of RCS inventory (ref. 1, 2).

NEI 99-01 Basis:

This IC addresses conditions that are precursors to a loss of the ability to adequately cool irradiated fuel (i.e., a precursor to a challenge to the fuel clad barrier). This condition represents a potential substantial reduction in the level of plant safety.

For this EAL, the inability to monitor RCS level may be caused by instrumentation and/or power failures, or water level dropping below the range of available instrumentation. If water level cannot be monitored, operators may determine that an inventory loss is occurring by observing changes in sump and/or tank levels. Sump and/or tank level changes must be evaluated against other potential sources of water flow to ensure they are indicative of leakage from the RCS.

The 15-minute duration for the loss of level indication was chosen because it is half of the EAL duration specified in IC CS1.

If the RCS inventory level continues to lower, then escalation to Site Area Emergency would be via IC CS1.

HNP Basis Reference(s):

1. GP-001, Reactor Coolant System Fill and Vent Mode 5
2. GP-008, Draining the Reactor Coolant System
3. GP-009, Refueling Cavity Fill, Refueling and Drain of the Refueling Cavity Modes 5-6-5
4. NEI 99-01 CA1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: Loss of RCS inventory affecting core decay heat removal capability

EAL:

CS1.1	**Site Area Emergency**
With CONTAINMENT CLOSURE **not** established, RCS level < 70% RVLIS Full Range	

Mode Applicability:

5 – Cold Shutdown, 6 – Refueling

Definition(s):

CONTAINMENT CLOSURE - The procedurally defined actions taken to secure containment and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions. As applied to HNP, Containment Closure is established when containment penetration closure is established in accordance with Technical Specifications 3/4.9.4.

HNP Basis:

70% RVLIS Full Range (ref. 1, 2) corresponds to the level of six inches below the bottom ID of the RCS hot leg penetration (252.04' el.). 6% has been added to the RVLIS setpoint to account for instrument uncertainties (ref. 2).

NEI 99-01 Basis:

This IC addresses a significant and prolonged loss of RCS inventory control and makeup capability leading to IMMINENT fuel damage. The lost inventory may be due to a RCS component failure, a loss of configuration control or prolonged boiling of reactor coolant. These conditions entail major failures of plant functions needed for protection of the public and thus warrant a Site Area Emergency declaration.

Following an extended loss of core decay heat removal and inventory makeup, decay heat will cause reactor coolant boiling and a further reduction in reactor vessel level. If RCS level cannot be restored, fuel damage is probable.

Outage/shutdown contingency plans typically provide for re-establishing or verifying CONTAINMENT CLOSURE following a loss of heat removal or RCS inventory control functions. The difference in the specified RCS levels of CS1.1 and CS1.2 reflect the fact that with CONTAINMENT CLOSURE established, there is a lower probability of a fission product release to the environment.

This EAL addresses 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.

Escalation of the emergency classification level would be via IC CG1 or RG1

HNP Basis Reference(s):

1. GP-008, Draining the Reactor Coolant System
2. EOP Setpoint Study, Revision 19, 4.0, FN K03
3. NEI 99-01 CS1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: Loss of RCS inventory affecting core decay heat removal capability

EAL:

CS1.2 Site Area Emergency
With CONTAINMENT CLOSURE established, RCS level < 63% RVLIS Full Range

Mode Applicability:

5 – Cold Shutdown, 6 – Refueling

Definition(s):

CONTAINMENT CLOSURE - The procedurally defined actions taken to secure containment and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions. As applied to HNP, Containment Closure is established when containment penetration closure is established in accordance with Technical Specifications 3/4.9.4.

HNP Basis:

63% RVLIS Full Range (ref. 1, 2) corresponds to the top of active fuel (249.01' el.). Other RCS level instruments are off-scale low when core uncovery occurs. 6% has been added to the RVLIS setpoint to account for instrument uncertainties (ref. 2).

NEI 99-01 Basis:

This IC addresses a significant and prolonged loss of RCS inventory control and makeup capability leading to IMMINENT fuel damage. The lost inventory may be due to a RCS component failure, a loss of configuration control or prolonged boiling of reactor coolant. These conditions entail major failures of plant functions needed for protection of the public and thus warrant a Site Area Emergency declaration.

Following an extended loss of core decay heat removal and inventory makeup, decay heat will cause reactor coolant boiling and a further reduction in reactor vessel level. If RCS level cannot be restored, fuel damage is probable.

Outage/shutdown contingency plans typically provide for re-establishing or verifying CONTAINMENT CLOSURE following a loss of heat removal or RCS inventory control functions. The difference in the specified RCS levels of CS1.1 and CS1.2 reflect the fact that with CONTAINMENT CLOSURE established, there is a lower probability of a fission product release to the environment.

This EAL addresses 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.

Escalation of the emergency classification level would be via IC CG1 or RG1

HNP Basis Reference(s):

1. GP-008, Draining the Reactor Coolant System
2. EOP Setpoint Study, Revision 19, 4.0, FN K03
3. NEI 99-01 CS1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: Loss of RCS inventory affecting core decay heat removal capability

EAL:

CS1.3 Site Area Emergency

RCS water level cannot be monitored for ≥ 30 min. (Note 1)
AND
Core uncovery is indicated by **any** of the following:

- UNPLANNED increase in **any** Table C-1 sump or tank due to a loss of RCS inventory
- Visual observation of UNISOLABLE RCS leakage
- Containment radiation > 10,000 R/hr (RM-1CR-3589-SA or RM-1CR-3590-SB)
- Erratic source range monitor indication

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Table C-1 Sumps / Tanks
• Containment sumps
• PRT
• RCDT
• CCW surge tank
• RAB sumps
• RWST
• RMWST
• Recycle Holdup Tank

Mode Applicability:

5 – Cold Shutdown, 6 – Refueling

Definition(s):

UNISOLABLE - An open or breached system line that cannot be isolated, remotely or locally.

UNPLANNED - A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

HNP Basis:

In this EAL, all RCS water level indication would be unavailable for greater than 30 minutes, and the RCS inventory loss must be detected by indirect leakage indications. Sump level increases must be evaluated against other potential sources of leakage. If the make-up rate to the RCS unexplainably rises above the pre-established rate, a loss of RCS inventory may be occurring even if the source of the leakage cannot be immediately identified. Sumps and tanks where RCS leakage may accumulate are listed in listed in Table C-1. Visual observation of leakage from systems connected to the RCS that cannot be isolated could also be indicative of a loss of RCS inventory (ref. 1, 2).

In the Refueling Mode, as water level in the reactor vessel lowers, the dose rate above the core will increase. The dose rate due to this core shine should result in indications on installed area radiation monitors (RM-1CR-3589-SA or RM-1CR-3590-SB). If these radiation monitors reach and exceed 10,000 R/hr, a loss of inventory with potential to uncover the core is likely to have occurred (ref. 4).

Post-TMI accident studies indicated that the installed PWR nuclear instrumentation will operate erratically when the core is uncovered and that this should be used as a tool for making such determinations.

NEI 99-01 Basis:

This IC addresses a significant and prolonged loss of RCS inventory control and makeup capability leading to IMMINENT fuel damage. The lost inventory may be due to a RCS component failure, a loss of configuration control or prolonged boiling of reactor coolant. These conditions entail major failures of plant functions needed for protection of the public and thus warrant a Site Area Emergency declaration.

Following an extended loss of core decay heat removal and inventory makeup, decay heat will cause reactor coolant boiling and a further reduction in reactor vessel level. If RCS level cannot be restored, fuel damage is probable.

The 30-minute criterion is tied to a readily recognizable event start time (i.e., the total loss of ability to monitor level), and allows sufficient time to monitor, assess and correlate reactor and plant conditions to determine if core uncovery has actually occurred (i.e., to account for various accident progression and instrumentation uncertainties). It also allows sufficient time for performance of actions to terminate leakage, recover inventory control/makeup equipment and/or restore level monitoring.

The inability to monitor RCS level may be caused by instrumentation and/or power failures, or water level dropping below the range of available instrumentation. If water level cannot be monitored, operators may determine that an inventory loss is occurring by observing changes

in sump and/or tank levels. Sump and/or tank level changes must be evaluated against other potential sources of water flow to ensure they are indicative of leakage from the RCS.

This EAL addresses 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.

Escalation of the emergency classification level would be via IC CG1 or RG1

HNP Basis Reference(s):

1. GP-001, Reactor Coolant System Fill and Vent Mode 5
2. GP-008, Draining the Reactor Coolant System
3. GP-009, Refueling Cavity Fill, Refueling and Drain of the Refueling Cavity Modes 5-6-5
4. AOP-031-BD, Loss of Refueling Cavity Integrity- Basis Document
5. NEI 99-01 CS1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: Loss of RCS inventory affecting fuel clad integrity with containment challenged

EAL:

CG1.1 General Emergency

RCS level < 63% RVLIS Full Range for ≥ 30 min. (Note 1)

AND

Any Containment Challenge indication, Table C-2

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 6: If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, declaration of a General Emergency is **not** required.

Table C-2 Containment Challenge Indications
• CONTAINMENT CLOSURE **not** established (Note 6)
• Containment hydrogen concentration ≥ 4%
• UNPLANNED rise in Containment pressure

Mode Applicability:

5 - Cold Shutdown, 6 – Refueling

Definition(s):

CONTAINMENT CLOSURE - The procedurally defined actions taken to secure containment and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions. As applied to HNP, Containment Closure is established when containment penetration closure is established in accordance with Technical Specifications 3/4.9.4.

UNPLANNED - A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

HNP Basis:

63% RVLIS Full Range (ref. 1, 2) corresponds to the top of active fuel (249.01' el.). Other RCS level instruments are off-scale low when core uncovery occurs. 6% has been added to the RVLIS setpoint to account for instrument uncertainties (ref. 2).

Three conditions are associated with a challenge to containment integrity:

- CONTAINMENT CLOSURE is not established.
- 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 gases in the 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. An explosive mixture can be formed when hydrogen gas concentration in the containment atmosphere is greater than 4% by volume in the presence of oxygen.
- Any unplanned increase in containment pressure in the Cold Shutdown or Refueling mode indicates a potential loss of containment closure capability. Unplanned containment pressure increases indicates containment closure cannot be assured and the containment cannot be relied upon as a barrier to fission product release.

NEI 99-01 Basis:

This IC addresses the inability to restore and maintain reactor vessel level above the top of active fuel with containment challenged. This condition represents actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

Following an extended loss of core decay heat removal and inventory makeup, decay heat will cause reactor coolant boiling and a further reduction in reactor vessel level. If RCS level cannot be restored, fuel damage is probable.

With CONTAINMENT CLOSURE not established, there is a high potential for a direct and unmonitored release of radioactivity to the environment. If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, then declaration of a General Emergency is not required.

The existence of an explosive mixture means, at a minimum, that the containment atmospheric hydrogen concentration is sufficient to support a hydrogen burn (i.e., at the lower deflagration limit). A hydrogen burn will raise containment pressure and could result in collateral equipment damage leading to a loss of containment integrity. It therefore represents a challenge to Containment integrity.

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 gas mixture in containment. If all installed hydrogen gas monitors are out-of-service during an event leading to fuel cladding damage, it may not be possible to obtain a containment hydrogen gas concentration reading as ambient conditions within the containment will preclude personnel access. During periods when installed containment hydrogen gas monitors are out-of-service, operators may use the other listed indications to assess whether or not containment is challenged.

The 30-minute criterion is tied to a readily recognizable event start time (i.e., the total loss of ability to monitor level), and allows sufficient time to monitor, assess and correlate reactor and plant conditions to determine if core uncovery has actually occurred (i.e., to account for various accident progression and instrumentation uncertainties). It also allows sufficient time for performance of actions to terminate leakage, recover inventory control/makeup equipment and/or restore level monitoring.

This EAL addresses 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*.

HNP Basis Reference(s):

1. GP-008, Draining the Reactor Coolant System
2. EOP Setpoint Study, Revision 19, 4.0, FN K03
6. NEI 99-01 CG1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 1 – RCS Level

Initiating Condition: Loss of RCS inventory affecting fuel clad integrity with containment challenged

EAL:

CG1.2 General Emergency

RCS level **cannot** be monitored for ≥ 30 min. (Note 1)

AND

Core uncovery is indicated by **any** of the following:

- UNPLANNED increase in **any** Table C-1 sump or tank due to a loss of RCS inventory
- Visual observation of UNISOLABLE RCS leakage
- Containment radiation > 10,000 R/hr (RM-1CR-3589-SA or RM-1CR-3590-SB)
- Erratic source range monitor indication

AND

Any Containment Challenge indication, Table C-2

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Note 6: If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, declaration of a General Emergency is **not** required.

Table C-1 Sumps / Tanks
• Containment sumps • PRT • RCDT • CCW surge tank • RAB sumps • RWST • RMWST • Recycle Holdup Tank

Table C-2 Containment Challenge Indications
• CONTAINMENT CLOSURE **not** established (Note 6)
• Containment hydrogen concentration ≥ 4%
• UNPLANNED rise in Containment pressure

Mode Applicability:

5 - Cold Shutdown, 6 – Refueling

Definition(s):

CONTAINMENT CLOSURE - The procedurally defined actions taken to secure containment and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions. As applied to HNP, Containment Closure is established when containment penetration closure is established in accordance with Technical Specifications 3/4.9.4.

UNISOLABLE - An open or breached system line that cannot be isolated, remotely or locally.

UNPLANNED - A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

HNP Basis:

In this EAL, all RCS water level indication would be unavailable for greater than 30 minutes, and the RCS inventory loss must be detected by indirect leakage indications. Sump level increases must be evaluated against other potential sources of leakage. If the make-up rate to the RCS unexplainably rises above the pre-established rate, a loss of RCS inventory may be occurring even if the source of the leakage cannot be immediately identified. Sumps and tanks where RCS leakage may accumulate are listed in listed in Table C-1. Visual observation of leakage from systems connected to the RCS that cannot be isolated could also be indicative of a loss of RCS inventory (ref. 1, 2).

In the Refueling Mode, as water level in the reactor vessel lowers, the dose rate above the core will increase. The dose rate due to this core shine should result in indications on installed area radiation monitors (RM-1CR-3589-SA or RM-1CR-3590-SB). If these radiation monitors reach and exceed 10,000 R/hr, a loss of inventory with potential to uncover the core is likely to have occurred (ref. 4).

Post-TMI accident studies indicated that the installed PWR nuclear instrumentation will operate erratically when the core is uncovered and that this should be used as a tool for making such determinations.

Three conditions are associated with a challenge to containment integrity:

- CONTAINMENT CLOSURE is not established.

- 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 gases in the 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. An explosive mixture can be formed when hydrogen gas concentration in the containment atmosphere is greater than 4% by volume in the presence of oxygen.
- Any unplanned increase in containment pressure in the Cold Shutdown or Refueling mode indicates a potential loss of containment closure capability. Unplanned containment pressure increases indicates containment closure cannot be assured and the containment cannot be relied upon as a barrier to fission product release.

NEI 99-01 Basis:

This IC addresses the inability to restore and maintain reactor vessel level above the top of active fuel with containment challenged. This condition represents actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

Following an extended loss of core decay heat removal and inventory makeup, decay heat will cause reactor coolant boiling and a further reduction in reactor vessel level. If RCS level cannot be restored, fuel damage is probable.

With CONTAINMENT CLOSURE not established, there is a high potential for a direct and unmonitored release of radioactivity to the environment. If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, then declaration of a General Emergency is not required.

The existence of an explosive mixture means, at a minimum, that the containment atmospheric hydrogen concentration is sufficient to support a hydrogen burn (i.e., at the lower deflagration limit). A hydrogen burn will raise containment pressure and could result in collateral equipment damage leading to a loss of containment integrity. It therefore represents a challenge to Containment integrity.

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 gas mixture in containment. If all installed hydrogen gas monitors are out-of-service during an event leading to fuel cladding damage, it may not be possible to obtain a containment hydrogen gas concentration reading as ambient conditions within the containment will preclude personnel access. During periods when installed containment hydrogen gas monitors are out-of-service, operators may use the other listed indications to assess whether or not containment is challenged.

The 30-minute criterion is tied to a readily recognizable event start time (i.e., the total loss of ability to monitor level), and allows sufficient time to monitor, assess and correlate reactor and plant conditions to determine if core uncovery has actually occurred (i.e., to account for various accident progression and instrumentation uncertainties). It also allows sufficient time for performance of actions to terminate leakage, recover inventory control/makeup equipment

and/or restore level monitoring.

The inability to monitor RCS level may be caused by instrumentation and/or power failures, or water level dropping below the range of available instrumentation. If water level cannot be monitored, operators may determine that an inventory loss is occurring by observing changes in sump and/or tank levels. Sump and/or tank level changes must be evaluated against other potential sources of water flow to ensure they are indicative of leakage from theRCS.

This EAL addresses 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.*

HNP Basis Reference(s):

1. GP-001, Reactor Coolant System Fill and Vent Mode 5
2. GP-008, Draining the Reactor Coolant System
3. GP-009, Refueling Cavity Fill, Refueling and Drain of the Refueling Cavity Modes 5-6-5
4. AOP-031-BD, Loss of Refueling Cavity Integrity- Basis Document
5. NEI 99-01 CG1

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 2 – Loss of Emergency AC Power

Initiating Condition: Loss of **all but one** AC power source to emergency buses for 15 minutes or longer

EAL:

CU2.1 Unusual Event

AC power capability to emergency 6.9 KV buses 1A-SA and 1B-SB reduced to a single power source for ≥ 15 min. (Note 1)

AND

Any additional single power source failure will result in loss of **all** AC power to SAFETY SYSTEMS

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Mode Applicability:

5 - Cold Shutdown, 6 – Refueling, D - Defueled

Definition(s):

SAFETY SYSTEM - A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related (as defined in 10CFR50.2):

Those structures, systems and components that are relied upon to remain functional during and following design basis events to assure:

(1) The integrity of the reactor coolant pressure boundary;

(2) The capability to shut down the reactor and maintain it in a safe shutdown condition;

(3) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures.

HNP Basis:

Power is supplied from the main generator to the switchyard through a main transformer bank. The main generator is directly connected to the main transformer bank through a 22 KV bus system and the 230 KV switchyard.

The Plant Electric Power Distribution System receives power under normal operating conditions from the main generator through two unit auxiliary transformers.

For startup and shutdown, when the main generator is unavailable, power is obtained through two start-up transformers from the grid and the 230 KV switchyard. These two transformers have sufficient capacity to provide for start-up and full load operation of the Unit. They also provide two separate sources of preferred (offsite) power to the Unit.

An additional path of power supply from the grid to the Plant Electric Power Distribution System can be made available after opening the disconnect links and disconnecting the main generator from the 22 KV bus. Power can be fed from the offsite power system through the main transformer bank and 22 KV bus to the unit auxiliary transformer, leaving the main generator disconnected. (ref. 2)

Emergency buses 1A-SA and 1B-SB provide power to supply all of the safety-related loads. The normal source of power for the emergency buses is the main generator/unit auxiliary transformer. When this source of power is not available, power is supplied from the 230 KV switchyard through the start-up transformers or, with the generator disconnect links removed, from the main and unit auxiliary transformers. When neither of these sources is available, power to the two emergency buses is supplied from diesel generators EDG A and EDG B (one diesel generator for each emergency bus). (ref. 3)

This cold condition EAL is equivalent to the hot condition EAL SA1.1.

NEI 99-01 Basis:

This IC describes a significant degradation of offsite and onsite AC power sources such that any additional single failure would result in a loss of all AC power to SAFETY SYSTEMS. In this condition, the sole AC power source may be powering one, or more than one, train of safety-related equipment.

When in the cold shutdown, refueling, or defueled mode, this condition is not classified as an Alert because of the increased time available to restore another power source to service. Additional time is available due to the reduced core decay heat load, and the lower temperatures and pressures in various plant systems. Thus, when in these modes, this condition is considered to be a potential degradation of the level of safety of the plant.

An "AC power source" is a source recognized in AOPs and EOPs, and capable of supplying required power to an emergency bus. Some examples of this condition are presented below.

- A loss of all offsite power with a concurrent failure of all but one emergency power source (e.g., an onsite diesel generator).
- A loss of all offsite power and loss of all emergency power sources (e.g., onsite diesel generators) with a single train of emergency buses being back-fed from the unit main generator.
- A loss of emergency power sources (e.g., onsite diesel generators) with a single train of emergency buses being fed from an offsite power source.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of power.

The subsequent loss of the remaining single power source would escalate the event to an Alert in accordance with IC CA2.

HNP Basis Reference(s):

1. FSAR Figure 8.1.3-1
2. FSAR 8.2
3. FSAR 8.3
4. EOP-ECA-0.0, Loss of all AC Power
5. NEI 99-01 CU2

Category: C – Cold Shutdown / Refueling System Malfunction

Subcategory: 2 – Loss of Emergency AC Power

Initiating Condition: Loss of **all** offsite and **all** onsite AC power to emergency buses for 15 minutes or longer

EAL:

CA2.1 Alert

Loss of **all** offsite and **all** onsite AC power capability to 6.9 KV emergency buses 1A-SA and 1B-SB for ≥ 15 min. (Note 1)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded.

Mode Applicability:

5 - Cold Shutdown, 6 - Refueling, D - Defueled

HNP Basis:

Power is supplied from the main generator to the switchyard through a main transformer bank. The main generator is directly connected to the main transformer bank through a 22 KV bus system and the 230 KV switchyard.

The Plant Electric Power Distribution System receives power under normal operating conditions from the main generator through two unit auxiliary transformers.

For startup and shutdown, when the main generator is unavailable, power is obtained through two start-up transformers from the grid and the 230 KV switchyard. These two transformers have sufficient capacity to provide for start-up and full load operation of the Unit. They also provide two separate sources of preferred (offsite) power to the Unit.

An additional path of power supply from the grid to the Plant Electric Power Distribution System can be made available after opening the disconnect links and disconnecting the main generator from the 22 KV bus. Power can be fed from the offsite power system through the main transformer bank and 22 KV bus to the unit auxiliary transformer, leaving the main generator disconnected. (ref. 2)

Emergency buses 1A-SA and 1B-SB provide power to supply all of the safety-related loads. The normal source of power for the emergency buses is the main generator/unit auxiliary transformer. When this source of power is not available, power is supplied from the 230 KV switchyard through the start-up transformers or, with the generator disconnect links removed, from the main and unit auxiliary transformers. When neither of these sources is available, power to the two emergency buses is supplied from diesel generators EDG A and EDG B (one diesel generator for each emergency bus). (ref. 3)

This cold condition EAL is equivalent to the hot condition loss of all offsite AC power EAL SS1.1.

NEI 99-01 Basis:

This IC addresses a total loss of AC power that compromises the performance of all SAFETY SYSTEMS requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink.

When in the cold shutdown, refueling, or defueled mode, this condition is not classified as a Site Area Emergency because of the increased time available to restore an emergency bus to service. Additional time is available due to the reduced core decay heat load, and the lower temperatures and pressures in various plant systems. Thus, when in these modes, this condition represents an actual or potential substantial degradation of the level of safety of the plant.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Escalation of the emergency classification level would be via IC CS1 or RS1.

HNP Basis Reference(s):

1. FSAR Figure 8.1.3-1
2. FSAR 8.2
3. FSAR 8.3
4. EOP-ECA-0.0, Loss of all AC Power
5. NEI 99-01 CA2