

# Attachment 3

## HCGS EAL Comparison Matrix



**Hope Creek Generating Station**

**EAL Comparison Matrix**

Draft E – 8/12/10

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### 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 Revision 5, Methodology for Development of Emergency Action Levels, and the HCGS ICs, Mode Applicability and EALs. This document provides a means of assessing HCGS differences and deviations from the NRC endorsed guidance given in NEI 99-01. Discussion of HCGS 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.

### 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
- HCGS EAL/IC identifier
- HCGS EAL/IC wording
- Description of any differences or deviations

### 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 Revision 5 (ADAMS Accession Number ML080450149) is the source document for the NEI EALs; the HCGS EAL Technical Bases Document for the HCGS EALs.

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

- Words or acronyms that are both uppercase and bold are defined terms.
- EAL threshold values and table references are bold but are not uppercase.
- EAL words or acronyms that are not threshold values and not defined terms may be emphasized by using uppercase print.
- Bold font, uppercase and underscore are used for logic terms, and quantifiers such as any, all, both, etc.

### Global Differences

The differences listed below generally apply throughout the set of EALs. The global differences do not decrease the effectiveness of the intent of NEI 99-01 Revision 5.

1. The NEI phrase "Notification of Unusual Event" has been changed to "Unusual Event" to reduce EAL-user reading burden.
2. The generic term "Emergency Director" has been replaced with the term "Emergency Coordinator" as the site specific title used at SGS and HCGS.
3. NEI 99-01 IC Example EALs are implemented in separate plant EALs to improve clarity and readability. For example, NEI lists all IC HU1 Example EALs under one IC. The corresponding HCGS EALs appear as unique EALs (e.g., HU1.1 through HU1.5).
4. HCGS Operating Modes are Operational Conditions (OPCONs). OPCON identifiers (numbers/letter) modify the NEI 99-01 mode applicability names as follows: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown, 4 - Cold Shutdown, 5 - Refuel, D – Defueled. NEI 99-01 defines Defueled as follows: "All reactor fuel removed from reactor pressure vessel. (Full core off load during refueling or extended outage)."
5. NEI 99-01 uses words for phrases such as greater than, less than, greater than or equal to, etc. in the wording of ICs and example EALs. To reduce EAL-user reading burden and for consistency with plant procedures, HCGS has adopted use of the symbols >, ≥, < and ≤ in place of the NEI 99-01 modifiers.

6. NEI EALs that include a time interval such as “15 minutes or longer” are expressed as conditional phrases “**AND [interval] minutes** have elapsed (Note 3)” to ensure the associated interval is not obscured by the EAL wording. (Some format variations are adopted to maintain proper syntax.) The parenthetical reference to a note directs the EAL-user to the appropriate NEI note concerning interpretation of the time interval.
7. EAL notes are numbered to facilitate referencing in the EAL matrix.
8. The NEI phrase “RPV/RCS water level” has been changed to “RPV level” for constancy with HCGS EOPs and other operating procedures.
9. The NEI definition of the Containment barrier represents the Primary Containment (PC) barrier in a BWR Mk I/II. When referring to the Containment barrier, Containment is used in the HCGS EALs.
10. IC/EAL identification:

- 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 Recognition Categories, however, are so broad and the IC descriptions are so varied that an EAL is difficult to locate in a timely manner when the EAL-user must refer to a set of EALs with the NEI organization and identification scheme. The NEI document clearly states that the EAL/IC/Recognition Category scheme is **not** intended to be the plant-specific EAL scheme for any plant, and appropriate human factors principles should be applied to development of an EAL scheme that helps the EAL-user make timely and accurate classifications. HCGS endeavors to improve upon the NEI EAL organization and identification scheme to enhance usability of the plant-specific EAL set. To this end, the HCGS IC/EAL scheme includes the following features:

- a. Division of the NEI EAL set into three groups:
  - EALs applicable under all plant operating modes (OPCONs) – 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

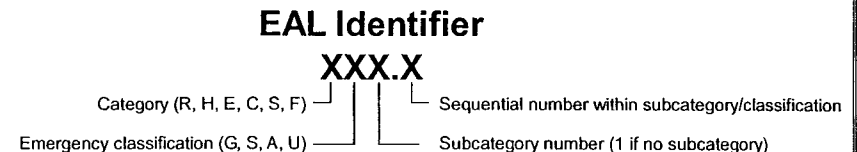
when the plant is in Hot Shutdown, Startup, or Power Operations mode.

- EALs applicable only under cold operating modes – This group would only be reviewed by the EAL-user when the plant is in Cold Shutdown, Refuel 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.

- 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 HCGS 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 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 Emergency Coordinator) 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.

Note that the NEI 99-01 identifier only identifies the IC, not the specific example EAL threshold. The NEI scheme, therefore, does not fulfill the above objectives which are desirable in facilitating timely and accurate emergency classification.

Table 2 lists the HCGS 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 HCGS 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 HCGS 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 HCGS (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 HCGS equipment/instrument identification and/or noun names to EALs.

- Changing the format of the EALs to conform to the HCGS EAL convention (e.g., numbering individual EALs, re-ordering individual EALs within an IC that does not affect the logic, etc.).
- 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 99-01 definitions. 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/Deviation Justification" columns in the remaining sections of this document identify each difference between the NEI 99-01 IC/EAL wording and the HCGS 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 effect 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 Revision 5. A summary list of HCGS EAL deviations from NEI 99-01 is given in Table 3.

**Table 1 – HCGS EAL Categories/Subcategories**

HCGS EALs		NEI Recognition Category
Category	Subcategory	
<u>Group: Any Operating Mode:</u>		
R – Abnormal Rad Release / Rad Effluent	1 – Offsite Rad Conditions 2 – Onsite Rad Conditions/Fuel Pool Events 3 - CR/CAS Rad	Abnormal Rad Levels/Radiological Effluent
E - ISFSI	Spent Fuel Transit & Storage	Events Related to Independent Spent Fuel Storage Installations
H – Hazards & Other Conditions Affecting Plant Safety	1 – Natural & Destructive Phenomena 2 – Fire or Explosion 3 – Hazardous Gas 4 – Security 5 – Control Room Evacuation 6 – EC Judgment	Hazards and Other Conditions Affecting Plant Safety
<u>Group: Hot Conditions:</u>		
S – System Malfunction	1 – Loss of AC Power 2 – Loss of DC Power 3 – ATWS / Criticality 4 – Inability to Reach or Maintain Shutdown Conditions 5 – Instrumentation 6 – Communications 7 – Fuel Clad Degradation 8 – RCS Leakage	System Malfunction
F – Fission Product Barrier Degradation	None	Fission Product Barrier Degradation
<u>Group: Cold Conditions:</u>		
C – Cold Shutdown / Refuel System Malfunction	1 – Loss of AC Power 2 – Loss of DC Power 3 – RPV Level 4 – RCS Temperature 5 – Communications 6 – Inadvertent Criticality	Cold Shutdown./ Refueling System Malfunction



Table 2 – NEI / HCGS EAL Identification Cross-Reference

NEI		Hope Creek Generating Station	
IC	Example EAL	Category and Subcategory	EAL
RU1	1	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RU1.1 RU1.2
RU1	2	N/A	N/A
RU1	3	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RU1.3
RU1	4	N/A	N/A
RU1	5	N/A	N/A
RU2	1	R – Abnormal Rad Release / Rad Effluent, 2 – Onsite Rad Conditions & Fuel Pool Events	RU2.1
RU2	2	R – Abnormal Rad Release / Rad Effluent, 2 – Onsite Rad Conditions & Fuel Pool Events	RU2.2
RA1	1	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RA1.1 RA1.2
RA1	2	N/A	N/A
RA1	3	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RA1.3
RA1	4	N/A	N/A
RA1	5	N/A	N/A
RA2	1	R – Abnormal Rad Release / Rad Effluent, 2 – Onsite Rad Conditions & Fuel Pool Events	RA2.2

NEI		Hope Creek Generating Station	
IC	Example EAL	Category and Subcategory	EAL
RA2	2	R – Abnormal Rad Release / Rad Effluent, 2 – Onsite Rad Conditions & Fuel Pool Events	RA2.1
RA3	1	R – Abnormal Rad Release / Rad Effluent, 2 – CR/CAS Rad	RA3.1
RS1	1	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RS1.1
RS1	2	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RS1.2
RS1	3	N/A	N/A
RS1	4	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RS1.3
RG1	1	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RG1.1
RG1	2	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RG1.2
RG1	3	N/A	N/A
RG1	4	R – Abnormal Rad Release / Rad Effluent, 1 – Offsite Rad Conditions	RG1.3
CU1	1, 2	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CU3.1
CU2	1	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CU3.3
CU2	2	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CU3.2
CU3	1	C – Cold SD/ Refuel System Malfunction, 1 – Loss of AC Power	CU1.1
CU4	1	C – Cold SD/ Refuel System Malfunction, 4 – RCS Temperature	CU4.1
CU4	2	C – Cold SD/ Refuel System Malfunction, 4 – RCS Temperature	CU4.2
CU6	1, 2	C – Cold SD/ Refuel System Malfunction, 5 – Communications	CU5.1
CU7	1	C – Cold SD/ Refuel System Malfunction, 2 – Loss of DC Power	CU2.1

NEI		Hope Creek Generating Station	
IC	Example EAL	Category and Subcategory	EAL
CU8	1	C – Cold SD/ Refuel System Malfunction, 6 – Inadvertent Criticality	CU6.1
CU8	2	N/A	N/A
CA1	1	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CA3.1
CA1	2	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CA3.2
CA3	1	C – Cold SD/ Refuel System Malfunction, 1 – Loss of AC Power	CA1.1
CA4	1, 2	C – Cold SD/ Refuel System Malfunction, 4 – RCS Temperature	CA4.1
CS1	1, 2	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CS3.1
CS1	3	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CS3.2
CG1	1	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CG3.1
CG1	2	C – Cold SD/ Refuel System Malfunction, 3 – RPV Level	CG3.2
D-AU1 D-AU2 D-SU1 D-HU1 D-HU2 D-HU3 D-AA1 D-AA2 D-HA1 D-HA2		N/A	N/A
EU1	1	E- ISFSI	EU1.1

NEI		Hope Creek Generating Station	
IC	Example EAL	Category and Subcategory	EAL
FU1	1	F – Fission Product Barriers	2 or 3 points
FA1	1	F – Fission Product Barriers	4 or 5 points
FS1	1	F – Fission Product Barriers	6 - 11 points
FG1	1	F – Fission Product Barriers	12 or 13 points
HU1	1	H – Hazards, 1 – Natural & Destructive Phenomena	HU1.1
HU1	2	H – Hazards, 1 – Natural & Destructive Phenomena	HU1.2
HU1	3	H – Hazards, 1 – Natural & Destructive Phenomena	HU1.4
HU1	4	H – Hazards, 1 – Natural & Destructive Phenomena	HU1.3
HU1	5	H – Hazards, 1 – Natural & Destructive Phenomena	HU1.5
HU2	1	H – Hazards, 2 – Fire or Explosion	HU2.1
HU2	2	H – Hazards, 2 – Fire or Explosion	HU2.2
HU3	1	H – Hazards, 3 – Toxic, Corrosive, Asphyxiant & Flammable Gas	HU3.1
HU3	2	H – Hazards, 3 – Toxic, Corrosive, Asphyxiant & Flammable Gas	HU3.2
HU4	1, 2, 3	H – Hazards, 4 – Security	HU4.1
HU5	1	H – Hazards, 6 – EC Judgment	HU6.1
HA1	1	H – Hazards, 1 – Natural & Destructive Phenomena	HA1.1
HA1	2	H – Hazards, 1 – Natural & Destructive Phenomena	HA1.2
HA1	3	H – Hazards, 1 – Natural & Destructive Phenomena	HA1.4

NEI		Hope Creek Generating Station	
IC	Example EAL	Category and Subcategory	EAL
HA1	4	H – Hazards, 1 – Natural & Destructive Phenomena	HA1.3
HA1	5	H – Hazards, 1 – Natural & Destructive Phenomena	HA1.6
HA1	6	N/A	N/A
HA2	1	H – Hazards, 2 – Fire or Explosion	HA2.1
HA3	1	H – Hazards, 3 – Toxic, Corrosive, Asphyxiant & Flammable Gas	HA3.1
HA4	1, 2	H – Hazards, 4 – Security	HA4.1
HA5	1	H – Hazards, 5 – Control Room Evacuation	HA5.1
HA6	1	H – Hazards, 6 – EC Judgment	HA6.1
HS2	1	H – Hazards, 5 – Control Room Evacuation	HS5.1
HS3	1	H – Hazards, 6 – EC Judgment	HS6.1
HS4	1	H – Hazards, 4 – Security	HS4.1
HG1	1, 2	H – Hazards, 4 – Security	HG4.1
HG2	1	H – Hazards, 6 – EC Judgment	HG6.1
SU1	1	S – System Malfunction, 1 – Loss of AC Power	SU1.1
SU2	1	S – System Malfunction, 3 – Inability to Reach or Maintain Shutdown Conditions	SU3.1
SU3	1	S – System Malfunction, 5 – Instrumentation	SU5.1
SU4	1	S – System Malfunction, 7 – Fuel Clad Degradation	SU7.1
SU4	2	S – System Malfunction, 7 – Fuel Clad Degradation	SU7.2

NEI		Hope Creek Generating Station	
IC	Example EAL	Category and Subcategory	EAL
SU5	1, 2	S – System Malfunction, 8 – RCS Leakage	SU8.1
SU6	1, 2	S – System Malfunction, 6 – Communications	SU6.1
SU8	1 (BWR)	S – System Malfunction, 3 – ATWS / Criticality	SU3.1
SU8	1 (PWR)	N/A	N/A
SA2	1	S – System Malfunction, 3 – ATWS / Criticality	SA3.1
SA4	1	S – System Malfunction, 5 – Instrumentation	SA5.1
SA5	1	S – System Malfunction, 1 – Loss of AC Power	SA1.1
SS1	1	S – System Malfunction, 1 – Loss of AC Power	SS1.1
SS2	1	S – System Malfunction, 3 – ATWS / Criticality	SS3.1
SS3	1	S – System Malfunction, 2 – Loss of DC Power	SS2.1
SS6	1	S – System Malfunction, 5 – Instrumentation	SS5.1
SG1	1	S – System Malfunction, 1 – Loss of AC Power	SG1.1
SG2	1	S – System Malfunction, 3 – ATWS / Criticality	SG3.1

<b>NEI 99-01</b>	<b>HCGS</b>
<b>Barrier Threshold</b>	<b>EAL</b>
FC Loss 1	FB3-L
FC Loss 2	FB1-L
FC Loss 4	FB2-L
FC Loss 6	FB4-L
FC P-Loss 2	FB1-P
FC P-Loss 6	FB2-P
RCS Loss 1	RB2-L
RCS Loss 2	RB1-L
RCS Loss 3	RB3-L
	RB4-L
RCS Loss 6	RB5-L
RCS P-Loss 3	RB1-P
	RB2-P
RCS P-Loss 6	RB3-P
CMT Loss 1	CB1-L
	CB2-L
CMT Loss 3	CB3-L
	CB4-L
	CB5-L
CMT Loss 6	CB6-L
CMT P-Loss 1	CB2-P
	CB3-P
	CB4-P
CMT P-Loss 2	CB1-P
CMT P-Loss 4	CB5-P
CMT P-Loss 6	CB6-P

**Table 3 – Summary of Deviations**

NEI		HCGS EAL	Description
IC	Example EAL		
HU2	1	HU2.1	The generic bases for HU2 example EAL #1 has been revised to clarify when the 15 minute classification time begins (what constitutes a credible notification/report of a fire). For events where only a single fire or smoke detector has alarmed, the 15 minute clock starts once on/near-scene visual confirmation is received.



**Table 4 – NEI 99-01 Rev. 5 Defined Terms**

NEI Term and Definition	HCGS Term and Definition	Difference/Deviation Justification
<p><b>AFFECTING SAFE SHUTDOWN:</b> Event in progress has adversely affected functions that are necessary to bring the plant to and maintain it in the applicable HOT or COLD SHUTDOWN condition. Plant condition applicability is determined by Technical Specification LCOs in effect.</p> <p>Example 1: Event causes damage that results in entry into an LCO that requires the plant to be placed in HOT SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event is not "AFFECTING SAFE SHUTDOWN."</p> <p>Example 2: Event causes damage that results in entry into an LCO that requires the plant to be placed in COLD SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event is "AFFECTING SAFE SHUTDOWN."</p>	<p>None</p>	<p>The NEI term and definition have been deleted because they are no longer used in NEI 99-01 and is not used in the Hope Creek EALs.</p>
<p><b>BOMB:</b> Refers to an explosive device suspected of having sufficient force to damage plant systems or structures.</p>	<p><b>BOMB:</b> Refers to an explosive device suspected of having sufficient force to damage plant systems or structures.</p>	<p>None</p>
<p><b>CIVIL DISTURBANCE:</b> A group of persons violently protesting station operations or activities at the site.</p>	<p><b>CIVIL DISTURBANCE:</b> A group of persons violently protesting station operations or activities at the site.</p>	<p>None</p>
<p><b>CONFINEMENT BOUNDARY:</b> The barrier(s) between areas containing radioactive substances and the environment.</p>	<p><b>CONFINEMENT BOUNDARY:</b> is the barrier(s) between areas containing radioactive substances and the environment and includes the multi-purpose canister (MPC) and, for the purposes of</p>	<p>The term "is" has been added to the beginning of the HCGS definition for clarity.</p> <p>The phrase "and the environment and includes the multi-purpose canister (MPC) and, for the purposes of this EAL,</p>

NEI Term and Definition	HCGS Term and Definition	Difference/Deviation Justification
	this EAL, the associated cask shielding.	the associated cask shielding"
<p><b>CONTAINMENT CLOSURE:</b> The site specific procedurally defined actions taken to secure containment (primary or secondary for BWR) and its associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions.</p>	<p><b>CONTAINMENT CLOSURE:</b> Is the procedurally defined actions taken to secure the Containment (Primary or Secondary) and its associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions.</p>	<p>The NEI phrase "...The site specific..." has been replaced with "...is the..." because it is commonly understood that this definition of Containment Closure applies to HCGS and not another site.</p>
<p><b>EXPLOSION:</b> A rapid, violent, unconfined combustion, or catastrophic failure of pressurized/energized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.</p>	<p><b>EXPLOSION:</b> A rapid, violent, unconfined combustion, or catastrophic failure of pressurized/energized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.</p>	None
<p><b>EXTORTION:</b> An attempt to cause an action at the station by threat of force.</p>	None	<p>The NEI term and definition have been deleted because they are no longer used in NEI 99-01 and is not used in the Hope Creek EALs.</p>
<p><b>FAULTED:</b> (PWRs) in a steam generator, the existence of secondary side leakage that results in an uncontrolled drop in steam generator pressure or the steam generator being completely depressurized.</p>	None	<p>The NEI term and definition have been deleted because they apply only to PWRs. HCGS is a BWR.</p>
<p><b>FIRE:</b> 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.</p>	<p><b>FIRE:</b> Combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute <b>FIRES</b>. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.</p>	None
<p><b>HOSTAGE:</b> A person(s) held as leverage against the station to ensure that demands will be met by the station.</p>	<p><b>HOSTAGE:</b> A person(s) held as leverage against the station to ensure that demands will be met by the station.</p>	None

NEI Term and Definition	HCGS Term and Definition	Difference/Deviation Justification
<p><b>HOSTILE ACTION:</b> An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take <b>HOSTAGES</b>, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, <b>PROJECTILES</b>, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. <b>HOSTILE ACTION</b> should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the NPP. 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).</p>	<p><b>HOSTILE ACTION:</b> An act toward Salem or Hope Creek or its personnel that includes the use of violent force to destroy equipment, take <b>HOSTAGES</b>, and/or intimidate PSEG to achieve an end. This includes attack by air, land, or water using guns, explosives, <b>PROJECTILES</b>, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. <b>HOSTILE ACTION</b> should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on Salem or Hope Creek. Non-terrorism-based EALs should be used to address such activities (i.e., this may include violent acts between individuals in the <b>OCA</b>).</p>	<p>The NEI terms “NPP” and “licensee” have been replaced with “Salem or Hope Creek” and “PSEG” to identify the specific entities to which the terms apply.</p> <p>The NEI phrase “owner controlled area” has been changed to “OCA” for simplification. OCA is the approved acronym for owner controlled area.</p>
<p><b>HOSTILE FORCE:</b> 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.</p>	<p><b>HOSTILE FORCE:</b> 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.</p>	<p>None</p>
<p><b>IMMINENT:</b> Mitigation actions have been ineffective, additional actions are not expected to be successful, and trended information indicates that the event or condition will occur. Where <b>IMMINENT</b> timeframes are specified, they shall apply.</p>	<p><b>IMMINENT:</b> Mitigation actions have been ineffective, additional actions are not expected to be successful, and trended information indicates that the event or condition will occur within approximately 2 hours (unless a different time is specified).</p>	<p>The NEI sentence “Where <b>IMMINENT</b> timeframes are specified, they shall apply” has been replaced with the phrase “...within approximately 2 hours (unless a different time is specified)” to provide a reasonable estimate of the duration over which trended information should be forecasted. This is a clarification of the NEI 99-01 definition and is consistent with previous training provided to Emergency Coordinators at Hope Creek.</p>
<p><b>INTRUSION:</b> A person(s) present in a specified area without authorization. Discovery of a <b>BOMB</b> in a specified area is indication of <b>INTRUSION</b> into that area by a <b>HOSTILE FORCE</b>.</p>	<p>None</p>	<p>The NEI term and definition have been deleted because they are no longer used in NEI 99-01 and is not used in the Hope Creek EALs.</p>

NEI Term and Definition	HCGS Term and Definition	Difference/Deviation Justification
<p><b>INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI):</b> A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.</p>	<p><b>INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI):</b> A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.</p>	None
<p><b>NORMAL PLANT OPERATIONS:</b> Activities at the plant site associated with routine testing, maintenance, or equipment operations, in accordance with normal operating or administrative procedures. Entry into abnormal or emergency operating procedures, or deviation from normal security or radiological controls posture, is a departure from <b>NORMAL PLANT OPERATIONS</b>.</p>	<p><b>NORMAL PLANT OPERATIONS:</b> Activities at the plant site associated with routine testing, maintenance, or equipment operations, in accordance with normal operating or administrative procedures. Entry into abnormal or emergency operating procedures, or deviation from normal security or radiological controls posture, is a departure from <b>NORMAL PLANT OPERATIONS</b>.</p>	None
<p><b>PROJECTILE:</b> An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.</p>	<p><b>PROJECTILE:</b> An object that impacts Salem and/or Hope Creek that could cause concern for continued operability, reliability, or personnel safety.</p>	<p>The NEI phrase "An object directed toward..." has been changed to "An object that impacts..." because <b>ROJECTILES</b> can be the result of an event that was not "directed" at the station but still "impacted the station. For Example, if a ship, plane, vehicle, etc. were to explode near the station a <b>PROJECTILE</b> could impact the stations but it was not "directed" at the station.</p> <p>The NEI "NPP" is "Salem and/or Hope Creek" stations.</p> <p>The NEI phrase "...for its continued operability..." has been changed to "...for continued operability..." to make the sentence flow better.</p>
<p><b>PROTECTED AREA:</b> Typically the site specific area which normally encompasses all controlled areas within the security <b>PROTECTED AREA</b> fence.</p>	<p><b>PROTECTED AREA (PA):</b> A security controlled area within the <b>OWNER-CONTROLLED AREA (OCA)</b> that is enclosed by the security perimeter fence and monitored by intrusion detection systems. Access to the PA requires proper security clearance and is controlled at the Security Center.</p>	<p>The NEI "site specific area" at HCGS is defined by the phrase "A security controlled area within the <b>OWNER-CONTROLLED AREA (OCA)</b> that is enclosed by the security perimeter fence and monitored by intrusion detection systems."</p> <p>The NEI phrase "...encompasses all controlled areas within the...fence" has been deleted because the above description</p>

NEI Term and Definition	HCGS Term and Definition	Difference/Deviation Justification
		<p>of "site specific area" provides a more detailed definition that plant operators can better relate to.</p> <p>The sentence "Access to the PA requires proper security clearance and is controlled at the Security Center" is added clarification the plant operators can better relate to.</p>
<p>RUPTURED: (PWRs) in a steam generator, existence of primary-to-secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection.</p>	<p>None</p>	<p>The NEI term and definition have been deleted because they apply only to PWRs. HCGS is a BWR.</p>
<p>SABOTAGE: Deliberate damage, mis-alignment, or mis-operation of plant equipment with the intent to render the equipment inoperable. Equipment found tampered with or damaged due to malicious mischief may not meet the definition of SABOTAGE until this determination is made by security supervision.</p>	<p><b>SABOTAGE:</b> Deliberate damage, mis-alignment, or mis-operation of plant equipment with the intent to render the equipment inoperable. Equipment found tampered with or damaged due to malicious mischief may not meet the definition of <b>SABOTAGE</b> until this determination is made by security supervision.</p>	<p>None</p>
<p>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.</p>	<p><b>SECURITY CONDITION: <u>ANY</u></b> 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 <b>SECURITY CONDITION</b> does not involve a <b>HOSTILE ACTION</b>.</p>	<p>None</p>
<p>SIGNIFICANT TRANSIENT: An UNPLANNED event involving one or more of the following: (1) automatic turbine runback greater than 25% thermal reactor power, (2) electrical load rejection greater than 25% full electrical load, (3) Reactor Trip, (4) Safety Injection Activation, or (5) thermal power oscillations greater than 10%.</p>	<p><b>SIGNIFICANT TRANSIENT:</b> An <b>UNPLANNED</b> event based on EC judgment, but includes as a minimum any one of the following: (1) Reactor Scram, (2) Electrical Load Rejection &gt; 25%, (3) Thermal Reactor Power Reduction &gt; 25%, (4) ECCS Injection, or (5) Thermal Power Oscillations greater than 10%.</p>	<p>The NEI phrase "...event involving one or more of the following..." has been changed to "...event based on EC judgment, but includes as a minimum any one of the following..." because to allow for EC judgment in determining if a <b>SIGNIFICANT TRANSIENT</b> has occurred. At times a number of minor events that occur at the same time could result in conditions equal to a <b>SIGNIFICANT TRANSIENT</b>.</p> <p>The NEI phrase "(1) automatic turbine runback greater than 25% thermal reactor power" has been changed to "(3)</p>

NEI Term and Definition	HCGS Term and Definition	Difference/Deviation Justification
		<p>Thermal Reactor Power Reduction &gt; 25%" because BWRs are not equipped with automatic turbine runbacks.</p> <p>The NEI phrase "(2) electrical load rejection greater than 25% full electrical load" has been changed to "(2) Electrical Load Rejection &gt; 25%" because it is clear from the context of the phrase that the percentage load rejection is in relation to the full electrical load.</p> <p>The NEI phrase "(4) Safety Injection Activation" has been changed to "(4) ECCS Injection" to use terminology common to a BWR.</p> <p>The NEI phrase "(3) Reactor Trip" has been changed to "(1) Reactor Scram" to use terminology common to a BWR.</p>
<p><b>STRIKE ACTION:</b> A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on (site specific). The STRIKE ACTION must threaten to interrupt NORMAL PLANT OPERATIONS.</p>	None	<p>The NEI term and definition have been deleted because they are no longer used in NEI 99-01 and is not used in the Hope Creek EALs.</p>
<p><b>UNISOLABLE:</b> A breach or leak that cannot be promptly isolated.</p>	<p><b>UNISOLABLE:</b> A breach or leak that cannot be promptly isolated from the Control Room.</p>	<p>The phrase "from the Control Room" has been added to the HCGS definition to emphasize the meaning of "promptly." In accordance with NEI basis discussion of example EALs using the term "UNISOLABLE," prompt isolation attempts include automatic isolation and manual action in the Control Room to close isolation valves.</p>
<p><b>UNPLANNED:</b> A parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.</p>	<p><b>UNPLANNED:</b> A parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.</p>	None
<p><b>VALID:</b> An indication, report, or condition, is considered to be VALID when it is verified by (1) an instrument channel check, (2) indications on related or redundant indicators,</p>	<p><b>VALID:</b> An indication, report, or condition, is considered to be <b>VALID</b> when it is verified by (1) an instrument channel check, (2) indications on related or redundant indicators, or (3) by direct</p>	None

NEI Term and Definition	HCGS Term and Definition	Difference/Deviation Justification
<p>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.</p>	<p>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.</p>	
<p><b>VISIBLE DAMAGE:</b> Damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of the affected structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.</p>	<p><b>VISIBLE DAMAGE:</b> Damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of the affected structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.</p>	<p>None</p>
<p><b>VITAL AREAS:</b> Typically any site specific areas, normally within the <b>PROTECTED AREA</b>, that contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.</p>	<p><b>VITAL AREAS:</b> Typically any site specific areas, normally within the <b>PROTECTED AREA</b>, that contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.</p>	<p>None</p>

**Category R**

**Abnormal Rad Levels / Rad Effluent**



NEI IC#	NEI IC Wording and Mode Applicability	HCGS IC#(s)	HCGS IC Wording and Mode Applicability	Difference/Deviation Justification
AU1	Any release of gaseous or liquid radioactivity to the environment greater than 2 times the Radiological Effluent Technical Specifications/ODCM for 60 minutes or longer.  MODE: All	RU1	Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM for 60 minutes or longer  OPCON: All	Deleted reference to RETS. ODCM limits provide the HCGS site-specific Radiological Effluent Technical Specifications.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>VALID reading on <b>ANY</b> of the following radiation monitors greater than the reading shown for 60 minutes or longer:</p> <p>(site specific monitor list and threshold values)</p> <p>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	RU1.1	<p><b>VALID</b> gaseous monitor reading &gt; <b>Table R-1</b> column "UE"</p> <p><b>AND</b></p> <p><b>≥ 60 minutes</b> have elapsed (Note 2)</p> <p>Note 2: 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 release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	<p>Gaseous release is emphasized in this EAL to be consistent with the NEI basis, which states "Some sites may find it advantageous to address gaseous and liquid releases with separate initiating conditions and EALs."</p> <p>The NEI phrase "VALID reading on <b>ANY</b> of the following radiation monitors greater than the reading shown ..." has been replaced with "<b>VALID</b> gaseous monitor reading &gt; <b>Table R-1</b> column "UE"..."</p> <ul style="list-style-type: none"> <li>• The HCGS radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1.</li> <li>• UE, Alert, SAE and GE thresholds for all HCGS 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.</li> <li>• The value shown in Table R-1 column "UE" for gaseous release points represents two times the ODCM release limit. The sum of the gaseous release point readings is specified to address the possibility of elevated radioactivity release simultaneously occurring</li> </ul>

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
				<p>at multiple locations.</p> <p>An asterisk note "For high alarm conditions on offgas pretreatment monitor 9RX621 or 9RX622, refer to EAL SU7.1" has been added to Table R-1. An offgas pretreatment radiation monitor alarm is an abnormal radiological condition and can be reasonably associated with Category R EALs. It is placed in the System Malfunction category to conform to NEI 99-01 guidance, however. The note helps direct the EAL user to the EAL applicable to abnormal offgas radiation.</p>
2	<p>VALID reading on any effluent monitor reading greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.</p> <p>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	RU1.2	<p><b>ANY VALID</b> liquid monitor reading &gt; <b>Table R-1</b> column "UE"</p> <p><b>AND</b></p> <p><b>≥ 60 minutes</b> have elapsed (Note 2)</p> <p>Note 2: 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 release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	<p>Liquid release is emphasized in this EAL to be consistent with the NEI basis, which states "Some sites may find it advantageous to address gaseous and liquid releases with separate initiating conditions and EALs."</p> <p>The NEI phrase "VALID reading on any effluent monitor reading greater than 2 times the alarm setpoint established by a current radioactivity discharge permit ..." has been replaced with "<b>ANY VALID</b> liquid monitor reading &gt; <b>Table R-1</b> column "UE"...."</p> <p>The HCGS radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1. UE, Alert, SAE and GE thresholds for all HCGS continuously monitored 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.</p> <p>The values shown in Table R-1 column "UE" for the liquid release points represent two times the ODCM release limits.</p>
3	Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates greater than 2 times (site specific RETS values) for 60	RU1.3	Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates > <b>Table R-2</b> column "UE"	<p>The NEI phrase "greater than 2 times (site specific RETS values)" has been changed to "&gt; <b>Table R-2</b> column "UE"..."</p> <p>The values shown in Table R-2 column "UE", consistent with the NEI bases, represent 2 times ODCM 3/4.11.1/2</p>

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
	<p>minutes or longer.</p> <p>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>		<p><b>AND</b></p> <p>≥ 60 minutes have elapsed (Note 2)</p> <p>Note 2: 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 release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	<p>concentrations.</p>
4	<p>VALID reading on perimeter radiation monitoring system greater than 0.10 mR/hr above normal* background sustained for 60 minutes or longer [for sites having telemetered perimeter monitors]</p> <p>* Normal can be considered as the highest reading in the past twenty-four hours excluding the current peak value.</p>	N/A	N/A	<p>Deleted NEI Example EAL #4 because the plant is not equipped with a perimeter radiation monitoring system. This threshold is properly addressed by the radiation monitors listed in Table R-1 and dose assessment capabilities.</p>
5	<p>VALID indication on automatic real-time dose assessment capability greater than (site-specific value) for 60 minutes or longer [for sites having such</p>	N/A	N/A	<p>Deleted NEI Example EAL #5 because the plant is not equipped with real-time dose assessment. This threshold is properly addressed by the radiation monitors listed in Table R-1 and dose assessment capabilities.</p>

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
	capability]			

	Release Point	Monitor	GE	SAE	ALERT	UE*
Gaseous	SPDS – (Total) Offsite Gas Rad Release  <u>OR</u> <u>SUM of:</u> FRVS Vent NG + North Plant Vent NG + South Plant Vent NG + Hardened Torus Vent NG	SPDS Point B5097  <u>OR</u> <u>SUM of:</u> 9RX680 + 9RX590 + 9RX580 + 9RX518	5.25E+08 µCi/sec	5.25E+07 µCi/sec	3.0E+06 µCi/sec	3.0E+04 µCi/sec
Liquid	Liquid Radwaste Discharge	9RX508	---	---	The lesser of the following thresholds: • >200X the High Alarm Setpoint • >5.80E-02 uCi/cc • >1.50E-02 uCi/cc – CST discharge only	2X the High Alarm Setpoint
	Cooling Tower Blowdown	9RX506	---	---	The lesser of the following thresholds: • > 200X the High Alarm Setpoint • >1.64E-03 µCi/cc	2X the High Alarm Setpoint
	TB Circ Water Discharge	9RX505	---	---	The lesser of the following thresholds: • > 200X the High Alarm Setpoint • > 4.80E-04 µCi/cc – for continuous release • >5.80E-02 uCi/cc for batch release	2X the High Alarm Setpoint

\* For high alarm conditions on offgas pretreatment monitor 9RX621 or 9RX622, refer to EAL SU7.1

NEI IC#	NEI IC Wording and Mode Applicability	HCGS IC#(s)	HCGS IC Wording and Mode Applicability	Difference/Deviation Justification
AU2	Unplanned rise in plant radiation levels MODE: All	RU2	<b>UNPLANNED</b> rise in plant radiation levels OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>a. UNPLANNED water level drop in a reactor refueling pathway as indicated by (site specific level or indication).</p> <p><b>AND</b></p> <p>b. VALID Area Radiation Monitor reading rise on (site specific list).</p>	RU2.1	<p><b>UNPLANNED</b> water level drop in the reactor cavity or spent fuel pool (SFP) as indicated by <b>ANY</b> of the following:</p> <ul style="list-style-type: none"> <li>• Confirmed SFP low level alarm Annunciator D1-A5 (FUEL POOL LEVEL HI/LO)</li> <li>• Reactor Water Level Shutdown Range Indicator LI-4605-B21</li> <li>• Visual observation (local or remote)</li> </ul> <p><b>AND</b></p> <p><b>VALID</b> area radiation monitor reading rise on <b>ANY</b> of the following:</p> <ul style="list-style-type: none"> <li>• Spent Fuel Storage Pool Area (9RX707)</li> <li>• New Fuel Criticality A Rad (9RX612)</li> <li>• New Fuel Criticality B Rad (9RX613)</li> <li>• Temporary Refueling Bridge ARM</li> </ul>	<p>The NEI phrase "...a reactor refueling pathway as indicated by (site specific level or indication)..." has been changed to "the reactor cavity or spent fuel pool (SFP) as indicated by <b>ANY</b> of the following: ..." for clarification. During the fuel transfer phase of refueling operations, the fuel pool gates are removed and the reactor cavity is in direct communication with the spent fuel pool. Therefore the refueling pathway is defined by the reactor cavity and SFP.</p> <p>The "site specific" indications are low SFP or cavity level alarms, reactor cavity level instrument or visual observation, local or remote (cameras).</p> <p>The "site-specific" radiation monitors are those located on the refuel floor because radiation levels in this area is likely to be affected by the loss of inventory from the refueling cavity, and spent fuel pool.</p>

Table R-2 Effluent Sample Classification Thresholds

	Release Point	Sample	ALERT	UE
Gaseous	FRVS Vent	NG	7.10E-01 $\mu\text{Ci/cc}$	7.10E-03 $\mu\text{Ci/cc}$
		I-131	8.20E-04 $\mu\text{Ci/cc}$	8.20E-06 $\mu\text{Ci/cc}$
	North Plant Vent	NG	1.52E-01 $\mu\text{Ci/cc}$	1.52E-03 $\mu\text{Ci/cc}$
		I-131	1.80E-04 $\mu\text{Ci/cc}$	1.80E-06 $\mu\text{Ci/cc}$
	South Plant Vent	NG	1.44E-02 $\mu\text{Ci/cc}$	1.44E-04 $\mu\text{Ci/cc}$
		I-131	1.68E-05 $\mu\text{Ci/cc}$	1.68E-07 $\mu\text{Ci/cc}$
Unmonitored	Isotopic	200 x ODCM 3/4.11.2	2 x ODCM 3/4.11.2	
Liquid	Liquid Radwaste Discharge	Isotopic	200 x ODCM 3/4.11.1	2 x ODCM 3/4.11.1
	Cooling Tower Blowdown	Isotopic	200 x ODCM 3/4.11.1	2 x ODCM 3/4.11.1
	TB Circ Water Discharge	Isotopic	200 x ODCM 3/4.11.1	2 x ODCM 3/4.11.1
	Unmonitored	Isotopic	200 x ODCM 3/4.11.1	2 x ODCM 3/4.11.1

2	<p>UNPLANNED VALID Area Radiation Monitor readings or survey results indicate a rise by a factor of 1000 over normal* levels.</p> <p>*Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value.</p>	RU2.2	<p><b>UNPLANNED VALID</b> area radiation monitor readings or survey results rise by a factor of <b>1,000</b> over normal levels (Note 7)</p> <p>Note 7: Normal levels can be considered as the highest reading in the past 24 hours excluding the current peak value</p>	<p>The term "indicate a..." has been deleted for proper English.</p> <p>The NEI asterisks and note have been changed to Note 7. Numbering this information facilitates referencing in the EAL matrix.</p> <p>The NEI term "twenty-four" has been replaced with Arabic numerals for clarification.</p>
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
AA1	Any release of gaseous or liquid radioactivity to the environment greater than 200 times the Radiological Effluent Technical Specifications/ODCM for 15 minutes or longer.  MODE: All	RA1	Any release of gaseous or liquid radioactivity to the environment greater than 200 times the ODCM for 15 minutes or longer  OPCON: All	Deleted reference to RETS. ODCM limits provide the HCGS site-specific Radiological Effluent Technical Specifications.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>VALID reading on <b>ANY</b> of the following radiation monitors greater than the reading shown for 15 minutes or longer:</p> <p>(site specific monitor list and threshold values)</p> <p>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	RA1.1	<p><b>VALID</b> gaseous monitor reading &gt; <b>Table R-1</b> column "ALERT"</p> <p><b>AND</b></p> <p><b>≥ 15 minutes</b> have elapsed (Note 2)</p> <p>Note 2: 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 release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	<p>Gaseous release is emphasized in this EAL to be consistent with the NEI basis, which states "Some sites may find it advantageous to address gaseous and liquid releases with separate initiating conditions and EALs."</p> <p>The NEI phrase "VALID reading on <b>ANY</b> of the following radiation monitors greater than the reading shown ..." has been replaced with "<b>VALID</b> gaseous monitor reading &gt; <b>Table R-1</b> column "ALERT"..."</p> <ul style="list-style-type: none"> <li>The HCGS radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1.</li> <li>UE, Alert, SAE and GE thresholds for all HCGS 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.</li> <li>The value shown in Table R-1 column "Alert" for gaseous release points represents two hundred times the ODCM release limits. The sum of the gaseous release point readings is specified to address the possibility of elevated radioactivity release</li> </ul>



				simultaneously occurring at multiple locations.
2	<p>VALID reading on any effluent monitor reading greater than 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer.</p> <p>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	RA1.2	<p><b>ANY VALID</b> liquid monitor reading &gt; <b>Table R-1</b> column "ALERT"</p> <p><b>AND</b></p> <p><b>≥ 15 minutes</b> have elapsed (Note 2)</p> <p>Note 2: 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 release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p>	<p>The NEI phrase "VALID reading on any effluent monitor reading greater than 200 times the alarm setpoint established by a current radioactivity discharge permit ..." has been replaced with "<b>ANY VALID</b> liquid monitor reading &gt; <b>Table R-1</b> column "ALERT" ..."</p> <p>Liquid release is emphasized in this EAL to be consistent with the NEI basis, which states "Some sites may find it advantageous to address gaseous and liquid releases with separate initiating conditions and EALs."</p> <p>The HCGS radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1. UE, Alert, SAE and GE thresholds for all HCGS continuously monitored 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.</p> <p>The values shown in Table R-1 column "Alert" represent two hundred times the ODCM release limits.</p>
3	<p>Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates greater than 200 times (site specific RETS values) for 15 minutes or longer.</p> <p>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has</p>	RA1.3	<p>Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates &gt; <b>Table R-2</b> column "ALERT"</p> <p><b>AND</b></p> <p><b>≥ 15 minutes</b> have elapsed (Note 2)</p> <p>Note 2: 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 release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the</p>	<p>The NEI phrase "greater than 200 times (site specific RETS values)" has been changed to "&gt; <b>Table R-2</b> column "ALERT"..."</p> <p>The values shown in Table R-2 column "UE", consistent with the NEI bases, represent 200 times ODCM 3/4.11.1/2 concentrations.</p>

	exceeded the applicable time if an ongoing release is detected and the release start time is unknown.		contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.	
4	<p>VALID reading on perimeter radiation monitoring system reading greater than 10.0 mR/hr above normal* background for 15 minutes or longer. [for sites having telemetered perimeter monitors]</p> <p>* Normal can be considered as the highest reading in the past twenty-four hours excluding the current peak value.</p>	N/A	N/A	Deleted NEI Example EAL #4 because the plant is not equipped with a perimeter radiation monitoring system. This threshold is properly addressed by the radiation monitors listed in Table R-1 and dose assessment capabilities.
5	<p>VALID indication on automatic real-time dose assessment capability indicating greater than (site specific value) for 15 minutes or longer. [for sites having such capability]</p>	N/A	N/A	Deleted NEI Example EALs #5 because the plant is not equipped with and real-time dose assessment. This threshold is properly addressed by the radiation monitors listed in Table R-1 and dose assessment capabilities.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
AA2	Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the reactor vessel.  MODE: All	RA2	Damage to irradiated fuel or loss of water level that has or will result in the uncovering of irradiated fuel outside the RPV  OPCON: All	Replaced the term "Reactor Vessel" with "RPV" as this is the common terminology for BWRs.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	A water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal that will result in irradiated fuel becoming uncovered.	RA2.2	A water level drop in the reactor cavity or spent fuel pool that will result in irradiated fuel becoming uncovered	The NEI phrase "fuel transfer canal" has been deleted. The HCGS reactor cavity is separated from the spent fuel pool by the fuel pool gates and bellows seal. This design does not have a fuel transfer canal. During the fuel transfer phase of refueling operations, the fuel pool gates are removed and the reactor cavity is in direct communication with the spent fuel pool.
2	A VALID alarm or (site specific elevated reading) on <b>ANY</b> of the following due to damage to irradiated fuel or loss of water level.  (site specific radiation monitors)	RA2.1	Damage to irradiated fuel or loss of water level (uncovering irradiated fuel outside the RPV) that causes a <b>VALID</b> high alarm on <b>ANY</b> of the following radiation monitors: <ul style="list-style-type: none"> <li>• Spent Fuel Storage Pool Area (9RX707)</li> <li>• New Fuel Criticality A Rad (9RX612)</li> <li>• New Fuel Criticality B Rad (9RX613)</li> <li>• Refuel Floor Exhaust Duct Rad Channel A (9RX627)</li> <li>• Refuel Floor Exhaust Duct Rad</li> </ul>	Reordered the wording of the EAL to clarify that the increased radiation levels are the result of damage or uncovering of irradiated fuel.  Incorporated the IC wording to clarify that the EAL threshold is based on uncovering irradiated fuel outside the RPV.  The NEI phrase "VALID alarm" has been changed to " <b>VALID</b> high alarm" because it is the high alarm signal associated with the listed radiation monitors that warns of elevated radiation levels anticipated if spent fuel were to become uncovered.  The listed radiation monitors represent the site-specific equivalents.

			Channel B (9RX628) • Refuel Floor Exhaust Duct Rad Channel C (9RX629)	
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
AA3	Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions. MODE: All	RA3	Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Dose rate greater than 15 mR/hr in <b>ANY</b> of the following areas requiring continuous occupancy to maintain plant safety functions:  (site specific area list)	RA3.1	Dose rates > 15 mR/hr in the Control Room (9RX710)	The NEI phrase " <b>ANY</b> of the following areas requiring continuous occupancy to maintain plant safety functions: (site specific area list)" has been changed to "the Control Room (9RX710)" because the only continuously occupied area at HCGS needed to maintain plant safety functions is the Control Room. The HCGS RadWaste Control Room is not required to be continuously occupied in order to maintain plant safety functions. Security alarm stations are located in the Salem Generating Station and are addressed in the Salem EALs. 9RX710 monitors area radiation level in the Control Room. There is no permanently installed CAS area radiation monitor that may be used to assess this EAL threshold.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
AS1	Off-site dose resulting from an actual or IMMEDIATE release of gaseous radioactivity greater than 100 mrem TEDE or 500 mrem Thyroid CDE for the actual or projected duration of the release. MODE: All	RS1	Offsite dose resulting from an actual or imminent release of gaseous radioactivity greater than 100 mRem TEDE or 500 mRem thyroid CDE for the actual or projected duration of the release OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	VALID reading on <b>ANY</b> of the following radiation monitors greater than the reading shown for 15 minutes or longer:  (site-specific list)  The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.	RS1.1	<b>VALID</b> gaseous monitor reading > <b>Table R-1</b> column "SAE"  <b>AND</b>  Dose assessment results are NOT available  <b>AND</b>  <b>≥ 15 minutes</b> have elapsed (Note 1)  Note 1: If dose assessment results are available, declaration should be based on dose assessment (EAL RS1.2) instead of gaseous monitor values. Do NOT delay declaration awaiting dose assessment results.  The Emergency Coordinator should NOT wait until the applicable time has elapsed, but should declare the event	The NEI phrase "VALID reading on <b>ANY</b> of the following radiation monitors greater than the reading shown ..." has been replaced with " <b>VALID</b> gaseous monitor reading > <b>Table R-1</b> column "SAE"..."  <ul style="list-style-type: none"> <li>The HCGS radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1.</li> <li>UE, Alert, SAE and GE thresholds for all HCGS 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.</li> <li>The value shown in Table R-1 column "SAE" for gaseous release points represents 10% of the EPA PAG for gaseous release. The sum of the gaseous release point readings is specified to address the possibility of elevated radioactivity release simultaneously occurring at multiple locations.</li> </ul> <p>The condition "AND Dose assessment results are NOT available" has been added to the plant EAL to emphasize the</p>

			as soon as it is determined that the condition will likely exceed the applicable time.	importance dose assessment results and use of this EAL. The first and second sentences of the note have been reversed and "(EAL RS1.2)" has been added to the note to emphasize the importance of dose assessment results.
2	Dose assessment using actual meteorology indicates doses greater than 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the site boundary.	RS1.2	Dose assessment using actual meteorology indicates TEDE 4-day dose > <b>4.0E+02 mRem</b> or Thyroid CDE dose > <b>2.0E+03 mRem</b> at or beyond the <b>MINIMUM EXCLUSION AREA (MEA)</b>	The NEI phrase "doses greater than 100 mrem TEDE or 500 mrem thyroid CDE" has been changed to "TEDE 4-day dose > <b>4.0E+02 mRem</b> or Thyroid CDE dose > <b>2.0E+03 mRem</b> " because the TEDE 4-day dose (output of PSEG dose assessment model – MIDAS) assumes a 4 hr release duration. To obtain the approximate dose for a projected release condition of 1 hour, the TEDE 4-day dose value would need to be divided by 4. A TEDE 4-Day Dose > 4.0E+02 mRem correspond directly to a TEDE dose rate value of 100 mRem/hr and exceeds 10% of the EPA Protective Actions Guides (PAGs). The Thyroid-CDE Dose > 2.0E+03 mRem correspond directly to an CDE dose rate value of 500 mRem/hr and exceeds 10% of the EPA Protective Actions Guides (PAGs) which was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.  The NEI phrase "site boundary" has been replaced with " <b>MINIMUM EXCLUSION AREA (MEA)</b> ." The MEA is the boundary used in the MIDAS dose assessment program that most closely approximates the site are boundary. For Hope Creek the MEA is 0.56 miles.
3	VALID perimeter radiation monitoring system reading greater than 100 mR/hr for 15 minutes or longer. [for sites having telemetered perimeter monitors]	N/A	N/A	Deleted NEI Example EAL #3 because the plant is not equipped with a perimeter radiation monitoring system. This threshold is properly addressed by the radiation monitors listed in Table R-1 and dose assessment capabilities.
4	Field survey results indicate closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer; or analyses of field survey samples indicate thyroid CDE greater than 500 mrem for	RS1.3	Field survey results indicate closed window dose rates > <b>100 mRem/hr</b> expected to continue for ≥ 1 hr at or beyond the <b>PROTECTED AREA BOUNDARY</b>	Split the example into two logical conditions separated by the "OR" logical connector for usability.  The NEI abbreviation "R" has been replaced with the plant term "Rem" to agree with units of measure given in the EPA PAGs.  The NEI phrase "one hour" has been abbreviated "1 hr" to

	<p>one hour of inhalation, at or beyond the site boundary.</p>		<p><u>OR</u> Analyses of field survey samples indicate I-131 concentration &gt; <b>3.85E-07 μCi/cc</b> at or beyond the <b>PROTECTED AREA BOUNDARY</b></p>	<p>reduce EAL-user reading burden.</p> <p>The NEI phrase “thyroid CDE greater than 500 mrem for one hour of inhalation” has been changed to “I-131 concentration &gt; <b>3.85E-07 μCi/cc</b>” because the Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of 500 mRem/hr for I-131.</p> <p>The NEI phrase “site boundary” has been changed to “the <b>PROTECTED AREA BOUNDARY</b>” because it is the only definable and accessible location to obtain field survey dose rate readings or to obtain field samples. The Salem/Hope Creek site is situated on Artificial Island, bordered by the Delaware River on one side and marshy wetlands on the other sides. Neither the defined Site Boundary nor the Minimum Exclusion Area boundary (used in lieu of the Site Boundary for the purpose of dose assessment) would be accessible to offsite field survey teams. Onsite survey teams dispatched to the Protected Area boundary would be the most practical location for detection of adverse radiological conditions at or beyond the site boundary.</p>
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
AG1	Off-site dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mrem TEDE or 5000 mrem Thyroid CDE for the actual or projected duration of the release using actual meteorology. MODE: All	RG1	Offsite dose resulting from an actual or imminent release of gaseous radioactivity greater than 1,000 mRem TEDE or 5,000 mRem thyroid CDE for the actual or projected duration of the release OPCON: All	Deleted the words "...using actual meteorology." The use of actual meteorology is only applicable to example EAL #2. Example EAL #1 is based on annual average meteorology. This is consistent with IC AS1.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	VALID reading on <b>ANY</b> of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site specific monitor list and threshold values)  The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.	RG1.1	<b>VALID</b> gaseous monitor reading > <b>Table R-1</b> column "GE"  <b>AND</b> Dose assessment results are NOT available  <b>AND</b> ≥ <b>15 minutes</b> have elapsed (Note 1)  Note 1: If dose assessment results are available, declaration should be based on dose assessment (EAL RG1.2) instead of gaseous monitor values. Do NOT delay declaration awaiting dose assessment results.  The Emergency	The NEI phrase "VALID reading on <b>ANY</b> of the following radiation monitors greater than the reading shown ..." has been replaced with "VALID gaseous monitor reading > <b>Table R-1</b> column "GE" ..."  <ul style="list-style-type: none"> <li>• The HCGS radiation monitors that detect radioactivity effluent release to the environment are listed in Table R-1.</li> <li>• UE, Alert, SAE and GE thresholds for all HCGS 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.</li> <li>• The value shown in Table R-1 column "GE" for gaseous release points represents 100% of the EPA PAG for gaseous release. The sum of the gaseous release point readings is specified to address the possibility of elevated radioactivity release simultaneously occurring at multiple locations.</li> </ul> The condition "AND Dose assessment results are NOT available" has been added to the plant EAL to emphasize the importance dose assessment results and use of this EAL.

			Coordinator should NOT wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.	The first and second sentences of the note have been reversed and "(EAL RG1.2)" has been added to the note to emphasize the importance of dose assessment results.
2	Dose assessment using actual meteorology indicates doses greater than 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond the site boundary.	RG1.2	Dose assessment using actual meteorology indicates TEDE 4-day dose > <b>4.0E+03 mRem</b> or Thyroid CDE dose > <b>2.0E+04 mRem</b> at or beyond the <b>MINIMUM EXCLUSION AREA (MEA)</b>	<p>The NEI phrase "doses greater than 1000 mrem TEDE or 5000 mrem thyroid CDE" has been changed to "TEDE 4-day dose &gt; <b>4.0E+03 mRem</b> or Thyroid CDE dose &gt; <b>2.0E+04 mRem</b>" because the dose assessment output (from MIDAS) on the SSCL is reported at varying distances from the plant as a TEDE 4-Day dose. This TEDE 4-day dose assumes a 4 hr release duration. To obtain the approximate dose for a projected release condition of 1 hour, the TEDE 4-day dose value would need to be divided by 4.</p> <p>A TEDE 4-Day Dose &gt; 4.0E+03 mRem correspond directly to a TEDE dose rate value of 1000 mRem/hr and exceeds the EPA Protective Actions Guides (PAGs). The Thyroid-CDE Dose &gt; 2.0E+04 mRem correspond directly to an CDE dose rate value of 5000 mRem/hr and exceeds the EPA Protective Actions Guides (PAGs) which was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.</p> <p>The NEI phrase "site boundary" has been replaced with "<b>MINIMUM EXCLUSION AREA (MEA)</b>." The MEA is the boundary used in the MIDAS dose assessment program that most closely approximates the site are boundary. For Hope Creek the MEA is 0.56 miles.</p>
3	VALID perimeter radiation monitoring system reading greater than 1000 mR/hr for 15 minutes or longer. [for sites having telemetered perimeter monitors]	N/A	N/A	Deleted NEI Example EAL #3 because the plant is not equipped with a perimeter radiation monitoring system. This threshold is properly addressed by the radiation monitors listed in Table R-1 and dose assessment capabilities.
4	Field survey results indicate closed window dose rates greater than 1000 mR/hr	RG1.3	Field survey results indicate closed window dose rates > <b>1000</b>	Split the example into two logical conditions separated by the "OR" logical connector for usability.

	<p>expected to continue for 60 minutes or longer; or analyses of field survey samples indicate thyroid CDE greater than 5000 mrem for one hour of inhalation, at or beyond site boundary.</p>		<p><b>mRem/hr</b> expected to continue for <math>\geq 1</math> hr at or beyond the <b>PROTECTED AREA BOUNDARY</b></p> <p><b><u>OR</u></b></p> <p>Analyses of field survey samples indicate I-131 concentration &gt; <b>3.85E-06 <math>\mu\text{Ci/cc}</math></b> at or beyond the <b>PROTECTED AREA BOUNDARY</b></p>	<p>The NEI abbreviation "R" has been replaced with the plant abbreviation "Rem" to agree with units of measure given in the EPA PAGs.</p> <p>The NEI phrase "thyroid CDE greater than 5000 mrem for one hour of inhalation" has been changed to "I-131 concentration &gt; <b>3.85E-06 <math>\mu\text{Ci/cc}</math></b>" because the Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of 5000 mRem/hr for I-131.</p> <p>The NEI phrase "site boundary" has been changed to "the <b>PROTECTED AREA BOUNDARY</b>" because it is the only definable and accessible location to obtain field survey dose rate readings or to obtain field samples. The Salem/Hope Creek site is situated on Artificial Island, bordered by the Delaware River on one side and marshy wetlands on the other sides. Neither the defined Site Boundary nor the Minimum Exclusion Area boundary (used in lieu of the Site Boundary for the purpose of dose assessment) would be accessible to offsite field survey teams. Onsite survey teams dispatched to the Protected Area boundary would be the most practical location for detection of adverse radiological conditions at or beyond the site boundary.</p>
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**Category C**

**Cold Shutdown / Refueling System Malfunction**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CU1	RCS Leakage MODE: Cold Shutdown	CU3	Unplanned loss of RPV inventory OPCON: 4 - Cold Shutdown	The IC has been changed from "RCS Leakage" to "Unplanned loss of RPV inventory" to align with NEI generic IC CU2. The example EALs of NEI CU1 manifest RCS leakage through loss of RPV inventory conditions. The intent of the two ICs is identical. This allows the HCGS-related EAL to be numbered with the other loss of inventory based EALs CU2.2 and CU2.3 which are derived from generic IC CU2.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	RCS leakage results in the inability to maintain or restore RPV level greater than (site specific low level RPS actuation setpoint) for 15 minutes or longer. [BWR]  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.	CU3.1	RCS leakage results in the inability to maintain or restore RPV level > <b>+12.5 in.</b>  <b>AND</b> <b>≥ 15 minutes</b> have elapse (Note 3)  Note 3: 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 will likely exceed the applicable time.	+12.5 in. is the site specific low RPV level RPS actuation setpoint.

1	RCS leakage results in the inability to maintain or restore level within (site specific pressurizer or RCS/RPV level target band) for 15 minutes or longer. [PWR]	N/A	N/A	The PWR portion of the NEI EAL has not been implemented because HCGS is a BWR.
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CU2	UNPLANNED loss of RCS/RPV inventory MODE: Refueling	CU3	<b>UNPLANNED</b> loss of RPV inventory OPCON: 5 - Refueling	The NEI acronym "RCS/RPV" has been replaced with "RPV" to use terminology commonly accepted at BWRs.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>UNPLANNED RCS/RPV level drop as indicated by either of the following:</p> <ul style="list-style-type: none"> <li>RCS/RPV water level drop below the RPV flange for 15 minutes or longer when the RCS/RPV level band is established above the RPV flange.</li> <li>RCS/RPV water level drop below the RCS level band for 15 minutes or longer when the RCS/RPV level band is established below the RPV flange.</li> </ul> <p><b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</p>	CU3.3	<p><b>UNPLANNED</b> RPV level drop as indicated by <b><u>EITHER</u></b> of the following:</p> <ul style="list-style-type: none"> <li>RPV level drop below the RPV flange level of <b>+217.5 in. ≥ 15 minutes</b> (Notes 3 and 8)</li> <li>RPV level drop below the planned RPV level band RPV level drop below the planned RPV level band (when RPV level is being controlled below the RPV flange) for a given (planned) evolution <b>≥ 15 minutes</b> (Notes 3 and 8)</li> </ul> <p>Note 3: 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 will likely exceed the applicable</p>	<p>+217.5 in. is the indicated level corresponding to the elevation of the RPV flange.</p> <p>The NEI phrase "RCS level band...when the RCS/RPV level band is established below the RPV flange" has been changed to "planned RPV level band (when RPV level is being controlled below the RPV flange) for a given (planned) evolution" for clarification..</p> <p>Note 8 has been added to ensure classification requirements due to the radiological consequences of a loss of inventory are addressed.</p>

			<p>time.</p> <p>Note 8 Loss of inventory in the refueling pathway may raise radiation levels. Consider classification under EAL RU2.1.</p>	
2	<p>RCS/RPV level cannot be monitored with a loss of RCS/RPV inventory as indicated by an unexplained level rise in (site specific sump or tank).</p>	CU3.2	<p>RPV level CANNOT be monitored</p> <p><b>AND</b></p> <p>A loss of RPV inventory as indicated by <b>ANY</b> unexplained RPV leakage indication, Table C-1 (Note 8)</p> <p>Note 8 Loss of inventory in the refueling pathway may raise radiation levels. Consider classification under EAL RU2.1.</p>	<p>The NEI phrase “with a loss of...” has been changed to “<b>AND</b> a loss of...” for clarification.</p> <p>Table C-1 lists the site-specific sumps and tank level conditions that could be indicative of a loss of inventory from the RPV. Drywell equipment and floor drain sump level rise is the normal method of monitoring and calculating leakage from the RPV. With RHR System operating in the Shutdown Cooling mode, an unexplained rise in suppression pool level could be indicative of RHR valve misalignment or leakage. Visual observation of leakage from systems connected to the RCS in areas outside the Primary Containment that cannot be isolated could be indicative of a loss of RPV inventory.</p> <p>Note 8 has been added to ensure classification requirements due to the radiological consequences of a loss of inventory are addressed.</p>



**Table C-1 RPV Leakage Indications**

- Drywell equipment drain sump level rise
- Drywell floor drain sump level rise
- Reactor Building equipment drain sump level rise
- Reactor Building floor drain sump level rise
- Suppression pool level rise
- Observation of RCS leakage that is **UNISOLABLE**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CU3	AC power capability to emergency busses reduced to a single power source for 15 minutes or longer such that any additional single failure would result in station blackout  MODE: Cold Shutdown, Refueling	CU1	AC power capability to vital buses reduced to a single power source for 15 minutes or longer such that <b>ANY</b> additional single failure would result in complete loss of AC power to vital buses  OPCON: 4 - Cold Shutdown, 5 - Refueling	"Vital buses" is equivalent to the NEI phrase "emergency buses."  The term "station blackout" was replaced with "complete loss of AC power to vital buses" as this describes the intended condition leading to the Alert threshold in CA1.1. Station Blackout is not an operationally defined term for loss of all AC to vital buses.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	a. AC power capability to (site specific emergency busses) reduced to a single power source for 15 minutes or longer  <b>AND</b>  b. Any additional single power source failure will result in station blackout.  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.	CU1.1	Loss of 4.16 KV Vital Bus Power Sources (Offsite and Onsite) which results in the availability of only <b>one</b> 4.16 KV Vital Bus Power Source (Offsite or Onsite)  <b>AND</b>  ≥ <b>15 minutes</b> have elapsed (Note 3)  Note 3: 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 will likely exceed the applicable time.	4.16 KV vital buses are the HCGS emergency buses.  The NEI phrase "AC power capability to (site specific emergency busses) reduced to a single power source" has been changed to "Loss of 4.16 KV Vital Bus Power Sources (Offsite and Onsite) which results in the availability of only one 4.16 KV Vital Bus Power Source (Offsite or Onsite)" to reflect the specific HCGS vital power configuration.  The AND logic used in NEI 99-01 is improper as the second condition is not a separate condition of equal weight but rather a qualifier of the first. The threshold statement has been reworded to properly reflect the intent.  Station Blackout is not an operationally defined term for loss of all AC to vital buses.



NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CU4	UNPLANNED loss of decay heat removal capability with irradiated fuel in the RPV  MODE: Cold Shutdown, Refueling	CU4	<b>UNPLANNED</b> loss of decay heat removal capability with irradiated fuel in the RPV  OPCON: 4 - Cold Shutdown, 5 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit.	CU4.1	An <b>UNPLANNED</b> Loss of Decay Heat Removal functions  <u>AND</u> RCS Temperature has risen to > <b>200°F</b>	The NEI phrase "UNPLANNED event results in" has been changed to "An UNPLANNED Loss of Decay Heat Removal functions AND" for clarification. According to the NEI IC and basis discussion, the event of interest involves the loss of decay heat removal capability.  200°F is the HCGS Technical Specification cold shutdown temperature limit and has been added for clarification.  The NEI phrase "... exceeding the Technical Specification cold shutdown temperature limit" has been replaced with " has risen to > <b>200°F</b> " for simplification. 200°F is universally understood to be the HCGS Technical Specification cold shutdown temperature limit.
2	Loss of all RCS temperature and RCS/RPV level indication for 15 minutes or longer.  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.	CU4.2	An <b>UNPLANNED</b> Loss of Decay Heat Removal functions  <u>AND</u> Loss of <b>BOTH</b> of the following: <ul style="list-style-type: none"> <li>• All RCS Temperature indication</li> <li>• All RPV level indication</li> </ul> <u>AND</u> ≥ <b>15 minutes</b> have elapsed (Note 3)	The phrase "'An UNPLANNED Loss of Decay Heat Removal functions AND" has been added for clarification. According to the NEI IC and basis discussion, the event of interest involves the loss of decay heat removal capability.  Reformatted the NEI EAL to improve readability.

			<p>Note 3: 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 will likely exceed the applicable time.</p>	
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CU6	Loss of all On-site or Off-site communications capabilities MODE: Cold Shutdown, Refueling, Defueled	CU5	Loss of all onsite or offsite communications capabilities OPCON: 4 - Cold Shutdown, 5 - Refueling, D - Defueled	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Loss of all of the following on-site communication methods affecting the ability to perform routine operations: (site specific list of communications methods)	CU5.1	Loss of <b>all Table C-4</b> Onsite communication methods affecting the ability to perform routine operations  <u>OR</u> Loss of <b>all Table C-4</b> Offsite communication methods affecting the ability to perform offsite notifications	CU5.1 implements Example EALs #1 and #2. These were combined for improved usability.  The NEI example EALs specify site-specific lists of onsite and offsite communications methods. The HCGS EAL lists these methods in Table C-4 for simplification.
2	Loss of all of the following off-site communication methods affecting the ability to perform offsite notifications: (site specific list of communications methods)			

Table C-4 Communications Systems		
System	Onsite	Offsite
Direct Inward Dial System (DID)	X	X
Station Page System (Gaitronics)	X	
Station Radio System	X	
Nuclear Emergency Telephone System (NETS)		X
Centrex Phone System (ESSX)		X
NRC (ENS)		X

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CU7	Loss of required DC power for 15 minutes or longer MODE: Cold Shutdown, Refueling	CU2	Loss of required DC power for 15 minutes or longer OPCON: 4 - Cold Shutdown, 5 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>Less than (site specific bus voltage indication) on required (site specific Vital DC busses) for 15 minutes or longer.</p> <p><b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</p>	CU2.1	<p>Loss of <b>ANY</b> of the following Vital 125 V DC Power Channel combinations as indicated by Voltage &lt; <b>108 V DC</b>:</p> <ul style="list-style-type: none"> <li>• Channel A and Channel B</li> <li>• Channel A, Channel C (either bus) and Channel D (either bus)</li> <li>• Channel B, Channel C (either bus) and Channel D (either bus)</li> </ul> <p><b>AND</b></p> <p>≥ <b>15 minutes</b> have elapsed (Note 3)</p> <p>Note 3: 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 will likely exceed the applicable</p>	<p>The NEI phrase “Less than...on required...busses...” has been replaced with “Loss of <b>ANY</b> of the following Vital 125 V DC Power Channel combinations as indicated by Voltage &lt; 108 V DC” per Technical Specifications for DC power capabilities in Modes 4 and 5.</p> <p>108 VDC is the site-specific bus voltage.</p> <p>The listed 125 VDC Power Channels are the site-specific vital DC buses. Technical Specifications define the required power channels and combinations of power channels. These have been added to the HCGS EAL for clarification.</p>



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EAL Comparison Matrix

OSSI HCGS

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CU8	Inadvertent criticality MODE: Cold Shutdown, Refueling	CU6	Inadvertent criticality OPCON: 4 - Cold Shutdown, 5 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	UNPLANNED sustained positive period observed on nuclear instrumentation. (BWR)	CU6.1	<b>UNPLANNED</b> sustained positive period observed on nuclear instrumentation	None
1	UNPLANNED sustained positive startup rate observed on nuclear instrumentation. (PWR)	N/A	N/A	NEI PWR Example EAL #1 has not been implemented because it applies only to PWR plants. HCGS is a BWR.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CA1	Loss of RCS/RPV inventory MODE: Cold Shutdown, Refueling	CA3	Loss of RPV inventory OPCON: 4 - Cold Shutdown, 5 - Refueling	The acronym "RCS" is not included to use terminology familiar to a BWR.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Loss of RCS/RPV inventory as indicated by level less than (site specific level).  <i>[Low-Low ECCS actuation setpoint / Level 2 (BWR)]</i> <i>[Bottom ID of the RCS loop (PWR)]</i>	CA3.1	RPV compensated level < -38 in.	The NEI phrase "Loss of RCS inventory as indicated by..." has been deleted (two places) because it is obvious from the low-low ECCS actuation setpoint water level (-38 in.) that inventory in the RCS has been lost. This change has been made to reduce EAL-user reading burden and thereby promote timely and accurate emergency classifications. The remainder of the plant EAL clearly associates the threshold parameters with the inventory in the RPV.  The term "compensated" has been added to the HCGS EAL to ensure readings from RPV water level instrumentation are properly adjusted for off-calibration conditions. In cold conditions, SPDS provides compensated readings and compensation curves are included in the Integrated Operating procedures to help correlate an indicated RPV level reading to actual RPV level.  HCGS is a BWR and is not equipped with the PWR RCS loop hot leg penetration.
2	RCS/RPV level cannot be monitored for 15 minutes or longer with a loss of RCS/RPV inventory as indicated by an unexplained level rise in (site specific sump or tank).  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should	CA3.2	RPV level CANNOT be monitored for <b>≥ 15 minutes</b> with a loss of RPV inventory as indicated by <b>ANY</b> unexplained RCS leakage indication, <b>Table C-1 (Note 3)</b>  Note 3: The Emergency Coordinator should NOT wait until the applicable time has	The acronym "RCS" is not included to use terminology familiar to a BWR.  Table C-1 lists the site-specific sumps and tank level conditions that could be indicative of a loss of inventory from the RPV. Drywell equipment and floor drain sump level rise is the normal method of monitoring and calculating leakage from the RPV. With RHR System operating in the Shutdown Cooling mode, an unexplained rise in suppression pool level could be indicative of RHR valve misalignment or leakage. Visual observation of leakage from systems connected to the RCS in areas outside the Primary Containment that cannot be

	<p>declare the event as soon as it is determined that the condition will likely exceed the applicable time.</p>		<p>elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</p>	<p>isolated could be indicative of a loss of RPV inventory.</p>
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**Table C-1 RPV Leakage Indications**

- Drywell equipment drain sump level rise
- Drywell floor drain sump level rise
- Reactor Building equipment drain sump level rise
- Reactor Building floor drain sump level rise
- Suppression pool level rise
- Observation of RCS leakage that is **UNISOLABLE**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CA3	Loss of all Off-site and all On-Site AC power to emergency busses for 15 minutes or longer.  MODE: Cold Shutdown, Refueling, Defueled	CA1	Loss of all offsite and all onsite AC power to vital buses for 15 minutes or longer  OPCON: 4 - Cold Shutdown, 5 - Refueling, D - Defueled	"Vital buses" is equivalent to the NEI phrase "emergency buses."

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Loss of all Off-Site and all On-Site AC Power to (site specific emergency busses) for 15 minutes or longer.  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.	CA1.1	Loss of all Power (Onsite and Offsite) to all 4.16 KV Vital Buses  <b>AND</b> <b>≥ 15 minutes</b> have elapsed (Note 3)  Note 3: 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 will likely exceed the applicable time.	The NEI phrase "Loss of all off-site and all on-site AC power" has been changed to "Loss of all Power (Onsite and Offsite)" for simplification.  4.16 KV vital buses are the HCGS emergency buses.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CA4	Inability to maintain plant in cold shutdown.  MODE: Cold Shutdown, Refueling	CA4	Inability to maintain plant in cold shutdown  OPCON: 4 - Cold Shutdown, 5 - Refueling	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	An UNPLANNED event results in RCS temperature greater than (site specific Technical Specification cold shutdown temperature limit) for greater than the specified duration on table.	CA4.1	An <b>UNPLANNED</b> event results in RCS temperature > <b>200°F</b> for > <b>Table C-3</b> duration  <u>OR</u> An <b>UNPLANNED</b> event results in RPV pressure increase > <b>10 psig</b> due to a loss of RCS cooling	NEI Example EALs #1 and #2 have been implemented in one EAL for simplification and to help ensure proper escalation from EALs CU4.1 and CU4.2.  NEI example table has been represented in Table C-3. HCGS is a BWR; therefore, all PWR only requirements (reduced inventory) have not been deleted.  The NEI phrase "... greater than (site specific Technical Specification cold shutdown temperature limit)... " has been replaced with "> 200°F." 200°F is the HCGS Technical Specification cold shutdown temperature limit.  A 10-psi RCS pressure increase is readable in the Control Room on PI-5824A (0 – 50 psig), PI-5824B (0 - 50 psig) and PI-R605-C32 (0 - 1200 psig).
2	An UNPLANNED event results in RCS pressure increase greater than 10 psi due to a loss of RCS cooling. (PWR-This EAL does not apply in Solid Plant conditions.)			

NEI Example Table:

Table: RCS Reheat Duration Thresholds		
RCS	Containment Closure	Duration
Intact (but not RCS Reduced Inventory (PWR))	N/A	60 minutes
Not intact or RCS 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.		

HCGS Table:

Table C-3 RCS Heatup Duration Thresholds		
RCS Integrity	CONTAINMENT CLOSURE	Duration threshold
Intact	NOT Applicable	60 minutes **
NOT Intact	Established	20 minutes **
NOT Intact	NOT Established	0 minutes
** IF a Decay Heat Removal System is placed in operation within the duration threshold and RCS Temperature is lowering, THEN this EAL is NOT Applicable		

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CS1	Loss of RCS/RPV inventory affecting core decay heat removal capability.  MODE: Cold Shutdown, Refueling	CS3	Loss of RPV inventory affecting core decay heat removal capability  OPCON: 4 - Cold Shutdown, 5 - Refueling	The acronym "RCS" is not included to use terminology familiar to a BWR.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	1. With CONTAINMENT CLOSURE not established, RCS/RPV level less than (site specific level).  [6" below the bottom ID of the RCS loop (PWR)]  [6" below the low-low ECCS actuation setpoint (BWR)]	CS3.1	<b>CONTAINMENT CLOSURE</b> NOT established <b>AND</b> RPV compensated level < <b>-44 in.</b>  <b>OR</b> <b>CONTAINMENT CLOSURE</b> established <b>AND</b> RPV compensated level < <b>-161 in.</b>	CS3.1 implements Example EALs #1 and #2. These were combined for improved usability. This allows the third NEI example EAL to be labeled CS3.2, which then makes all of the "level cannot be monitored" EALs in the RPV Level subcategory the second EAL in each classification level.  The acronym "RCS" is not included to use terminology familiar to a BWR.  The term "compensated" has been added to the HCGS EAL to ensure readings from RPV water level instrumentation are properly adjusted for off-calibration conditions. In cold conditions, SPDS provides compensated readings and compensation curves are included in the Integrated Operating procedures to help correlate an indicated RPV level reading to actual RPV level.  HCGS is a BWR and is not equipped with the PWR RCS loop setpoint.  -44 in. is six inches below the low-low ECCS actuation setpoint (-38 in.).  -161 in. is the top of active fuel.
2	2. With CONTAINMENT CLOSURE established, RCS/RPV level less than (site specific level for TOAF).			
3	RCS/RPV level cannot be monitored for 30 minutes or longer with a loss of RCS/RPV inventory as indicated by <b>ANY</b> of	CS3.2	RPV level <b>CANNOT</b> be monitored for <b>≥ 30 minutes</b> with a loss of RPV inventory as indicated by <b>EITHER</b> of the	The acronym "RCS" is not included to use terminology familiar to a BWR.  The NEI phrase "UNPLANNED level rise in (site specific sump or tank)" has been changed to " <b>ANY</b> unexplained RPV leakage



	<p>the following:</p> <ul style="list-style-type: none"> <li>• (Site specific radiation monitor) reading greater than (site specific value).</li> <li>• Erratic Source Range Monitor Indication.</li> <li>• UNPLANNED level rise in (site specific sump or tank).</li> </ul> <p><b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</p>	<p>following (Note 3):</p> <ul style="list-style-type: none"> <li>• Erratic Source Range Monitor indication</li> <li>• <b>ANY</b> unexplained RPV leakage indication, <b>Table C-1</b></li> </ul> <p>Note 3: 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 will likely exceed the applicable time.</p>	<p>indication, <b>Table C-1</b>" to facilitate listing the indications in a table consistent with CU3.2, CA3.2 and CG3.2.</p> <p>The NEI 99-01 example EALs include the use of radiation monitor readings corresponding to those expected for core uncover in the Refueling Mode (vessel head removed). HCGS containment high range area radiation monitors are designated RE-4825A and RE-4825B and are located in the drywell at 145' elevation. The bottom of the RPV is at elevation 115' 3" and the top of active fuel is at elevation 145' 8". These monitors cannot, therefore, sense the loss of water shielding above the core as would be required to determine if core uncover is occurring. The generic bases states that the use of radiation monitoring as an EAL input may not be appropriate for some BWRs. Consistent with the NEI bases, these HCGS monitors cannot be utilized for this purpose because of their location relative to the top of active fuel.</p> <p>Additionally, no other installed high range radiation monitoring system exists that can be utilized for the function. However, HCGS does have extensive redundant RPV level monitoring capability available to assess core uncover in the Refueling Mode. However, consistent with indicators used in the EALs derived from generic IC CS1, unexplained RPV leakage indications in Table C-1 have been incorporated as other site specific indicators of inventory loss.</p> <p>Table C-1 lists the site-specific sumps and tank level conditions that could be indicative of a loss of inventory from the RPV. Drywell equipment and floor drain sump level rise is the normal method of monitoring and calculating leakage from the RPV. With RHR System operating in the Shutdown Cooling mode, an unexplained rise in suppression pool level could be indicative of RHR valve misalignment or leakage. Visual observation of leakage from systems connected to the RCS in areas outside the Primary Containment that cannot be isolated could be indicative of a loss of RPV inventory.</p>
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**Table C-1 RPV Leakage Indications**

- Drywell equipment drain sump level rise
- Drywell floor drain sump level rise
- Reactor Building equipment drain sump level rise
- Reactor Building floor drain sump level rise
- Suppression pool level rise
- Observation of RCS leakage that is **UNISOLABLE**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
CG1	Loss of RCS/RPV inventory affecting fuel clad integrity with containment challenged  MODE: Cold Shutdown, Refueling	CG3	Loss of RPV inventory affecting fuel clad integrity with Containment challenged  OPCON: 4 - Cold Shutdown, 5 - Refueling	The acronym "RCS" is not included to use terminology familiar to a BWR.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>a. RCS/RPV level less than (site specific level for TOAF) for 30 minutes or longer.</p> <p><b>AND</b></p> <p>b. <b>ANY</b> containment challenge indication (see Table):</p> <p><b>Table: Containment Challenge Indications</b></p> <ul style="list-style-type: none"> <li>• CONTAINMENT CLOSURE not established.</li> <li>• (Site specific explosive mixture) inside containment.</li> <li>• UNPLANNED rise in containment pressure</li> <li>• Secondary containment radiation monitor reading above (site specific value). [BWR only]</li> </ul> <p><b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should</p>	CG3.1	<p>RPV compensated level &lt; -161 in. for ≥ 30 min. (Note 3)</p> <p><b>AND</b></p> <p><b>ANY</b> Containment Challenge indication, <b>Table C-2</b></p> <p>Note 3: 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 will likely exceed the applicable time.</p>	<p>The acronym "RCS" is not included to use terminology familiar to a BWR.</p> <p>-161 in. is the top of active fuel.</p> <p>The term "compensated" has been added to the HCGS EAL to ensure readings from RPV water level instrumentation are properly adjusted for off-calibration conditions. In cold conditions, SPDS provides compensated readings and compensation curves are included in the Integrated Operating procedures to help correlate an indicated RPV level reading to actual RPV level.</p> <p>Table C-2 lists the Containment Challenge indications.</p> <p>The NEI threshold "(Site specific explosive mixture) inside containment" has been changed to "≥ 6% H<sub>2</sub> and ≥ 5% O<sub>2</sub> in Drywell or Torus". The BWROG EPGs/SAGs specifically define the limits associated with explosive mixtures in terms of deflagration concentrations of hydrogen and oxygen inside the drywell and torus.</p> <p>The NEI phrase "Secondary Containment radiation monitors above {site-specific} value (BWR only)" has been changed to "<u>Any</u> Reactor Bldg rad level &gt; 1000 times normal" to agree with the syntax employed in the HCGS EOP Flowchart 103 definition of the Maximum Safe Operating radiation level. This is consistent with the NEI 99-01 IC CG1 basis which states "the site-specific radiation monitor values should be based on the EOP "maximum safe values" because these values are easily recognizable and</p>

	<p>declare the event as soon as it is determined that the condition will likely exceed the applicable time.</p>			<p>have an emergency basis.”</p>
<p>2</p>	<p>a. RCS/RPV level cannot be monitored with core uncover indicated by <b>ANY</b> of the following for 30 minutes or longer.</p> <ul style="list-style-type: none"> <li>• (Site specific radiation monitor) reading greater than (site specific setpoint).</li> <li>• Erratic source range monitor indication</li> <li>• UNPLANNED level rise in (site specific sump or tank).</li> <li>• <i>[Other site specific indications]</i></li> </ul> <p><b>AND</b></p> <p>b. <b>ANY</b> containment challenge indication (see Table):</p> <p><b>Table: Containment Challenge Indications</b></p> <ul style="list-style-type: none"> <li>• CONTAINMENT CLOSURE not established.</li> <li>• (Site specific explosive mixture) inside containment.</li> <li>• UNPLANNED rise in containment pressure</li> <li>• Secondary containment radiation monitor reading above (site specific value). <i>[BWR only]</i></li> </ul>	<p>CG3.2</p>	<p>RPV level CANNOT be monitored for <b>≥ 30 minutes</b> with core uncover indicated by <b>EITHER</b> of the following (Note 3):</p> <ul style="list-style-type: none"> <li>• Erratic Source Range Monitor indication</li> <li>• <b>ANY</b> unexplained RPV leakage indication, <b>Table C-1</b></li> </ul> <p><b>AND</b></p> <p><b>ANY</b> Containment Challenge indication, <b>Table C-2</b></p> <p>Note 3: 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 will likely exceed the applicable time.</p>	<p>The NEI 99-01 example EALs include the use of radiation monitor readings corresponding to those expected for core uncover in the Refueling Mode (vessel head removed). HCGS containment high range area radiation monitors are designated RE-4825A and RE-4825B and are located in the drywell at 145' elevation. The bottom of the RPV is at elevation 115' 3" and the top of active fuel is at elevation 145' 8". These monitors cannot, therefore, sense the loss of water shielding above the core as would be required to determine if core uncover is occurring. The generic bases states that the use of radiation monitoring as an EAL input may not be appropriate for some BWRs. Consistent with the NEI bases, these HCGS monitors cannot be utilized for this purpose because of their location relative to the top of active fuel.</p> <p>Additionally, no other installed high range radiation monitoring system exists that can be utilized for the function. However, HCGS does have extensive redundant RPV level monitoring capability available to assess core uncover in the Refueling Mode. However, consistent with indicators used in the EALs derived from generic IC CG1, unexplained RPV leakage indications in Table C-1 have been incorporated as other site specific indicators of inventory loss.</p> <p>Table C-1 lists the site-specific sumps and tank level conditions that could be indicative of a loss of inventory from the RPV. Drywell equipment and floor drain sump level rise is the normal method of monitoring and calculating leakage from the RPV. With RHR System operating in the Shutdown Cooling mode, an unexplained rise in suppression pool level could be indicative of RHR valve misalignment or leakage. Visual observation of leakage from systems connected to the RCS in areas outside the Primary Containment that cannot be isolated could be indicative of a loss of RPV inventory.</p> <p>Table C-2 lists the Containment Challenge indications.</p> <p>The NEI threshold "(Site specific explosive mixture) inside</p>

	<p><b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</p>			<p>containment” has been changed to “Indications of <math>\geq 6\% \text{H}_2</math> and <math>\geq 5\% \text{O}_2</math> in Drywell or Torus”. The BWROG EPGs/SAGs specifically define the limits associated with explosive mixtures in terms of deflagration concentrations of hydrogen and oxygen inside the drywell and torus.</p> <p>The NEI phrase “Secondary Containment radiation monitors above {site-specific} value (BWR only)” has been changed to “<b>Any</b> Reactor Bldg rad level &gt; <b>1000 times normal</b>” to agree with the syntax employed in the HCGS EOP Flowchart 103 definition of the Maximum Safe Operating radiation level. This is consistent with the NEI 99-01 IC CG1 basis which states “the site-specific radiation monitor values should be based on the EOP “maximum safe values” because these values are easily recognizable and have an emergency basis.”</p>
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**Table C-1 RPV Leakage Indications**

- Drywell equipment drain sump level rise
- Drywell floor drain sump level rise
- Reactor Building equipment drain sump level rise
- Reactor Building floor drain sump level rise
- Suppression pool level rise
- Observation of RCS leakage that is **UNISOLABLE**

**Table C-2 Containment Challenge Indications**

- **CONTAINMENT CLOSURE** NOT established
- Indications of  $\geq 6\% \text{H}_2$  and  $\geq 5\% \text{O}_2$  in Drywell or Torus
- **UNPLANNED** rise in Drywell pressure
- ANY Reactor Bldg rad level > **1000 times normal**

**Category D**

**Permanently Defueled Station Malfunction**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
D-AU1 D-AU2 D-SU1 D-HU1 D-HU2 D-HU3 D-AA1 D-AA2 D-HA1 D-HA2	Recognition Category D Permanently Defueled Station Malfunction	N/A	N/A	NEI Recognition Category D ICs and EALs are applicable only to permanently defueled stations. HCGS is not a defueled station.



**Category E**

**Events Related to Independent Spent Fuel Storage Installations**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
E-HU1	Damage to a loaded cask CONFINEMENT BOUNDARY MODE: N/A	EU1	Damage to a loaded cask <b>CONFINEMENT BOUNDARY</b> OPCON: Mode Not Applicable	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Damage to a loaded cask CONFINEMENT BOUNDARY.	EU1.1	Damage to a Multi Purpose Canister (MPC) <b>CONFINEMENT BOUNDARY</b> as indicated by on-contact radiation readings $\geq 600$ mR/hr (gamma + neutron) on the surface of the spent fuel cask, excluding the air vents, OR $\geq 60$ mR/hr (gamma + neutron) on the top of the spent fuel cask.	<p>The NEI phrase "loaded CONFINEMENT BOUNDARY" has been changed to "Multi Purpose Canister (MPC) <b>CONFINEMENT BOUNDARY</b> as indicated by on-contact radiation readings <math>\geq 600</math> mR/hr (gamma + neutron) on the surface of the spent fuel cask, excluding the air vents, OR <math>\geq 60</math> mR/hr (gamma + neutron) on the top of the spent fuel cask."</p> <p>As provided in the Holtec HI-STORM 100 System Certificate of Compliance (CoC), Appendix A (Technical Specifications), Section 5.7.4 contains radiation values for the cask that should not be exceeded. Under Amendment #5, the highest allowable radiation level on contact with the HI-STORM 100 cask body is 300 mR/hr on the side of the cask and 30 mR/hr on the top of the cask. Keeping in line with NEI guidance that a UE is warranted for radiation conditions at a level of twice the Technical Specification value, <b>600 mR/hr</b> and <b>60 mR/hr</b> are being used as the EAL threshold radiation levels.</p> <p>The threshold values are sufficiently above nominal radiation levels of the <b>CONFINEMENT BOUNDARY</b> that radiation levels above this EAL threshold would indicate significant damage to the <b>CONFINEMENT BOUNDARY</b>.</p> <p>No releases of radioactive material requiring offsite response or monitoring are expected because the seal-welded spent fuel canister (part of the <b>CONFINEMENT BOUNDARY</b>) is designed to remain intact under all normal, off-normal, and credible accident conditions of onsite transport and storage at the ISFSI, according to</p>

				<p>Holtec licensing documents.</p> <p>Postulated problems associated with the dry cask storage system include those caused by natural phenomena or accidents caused by human error/equipment malfunctions which affect the storage system. Generally speaking, the limiting impacts to the system include loss of shielding capability and loss of fuel canister integrity. The loss of shielding would result in higher direct radiation to the environment, while the loss of fuel canister integrity results in a release of radioactive materials from the Multi-Purpose Canister (MPC) within the cask to the environment. However, the particular dry storage system used at the PSEG Nuclear ISFSI is a robust seal-welded, canister-based system that is designed to remain leak-tight under all normal, off-normal and postulated accident conditions. Therefore, effluent release from the storage system is not a credible condition. In addition, because the amount of radioactive material inside the dry storage system is fixed, the source term never increases over time and, in fact, decreases over time due to radioactive decay.</p> <p>The effect on cask shielding effectiveness under off-normal and accident conditions is evaluated in Chapter 11 of the HI-STORM FSAR. Only one event resulted in a slight loss of the cask shielding effectiveness that was caused by the postulated accident conditions evaluated for a fire. A very small percentage of the cask exterior concrete was estimated to be degraded, which did not result in any significant projected increase in dose rates. No release of radioactive material from the MPC is projected for any off-normal or accident event.</p>
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**Category F**

**Fission Product Barrier Degradation**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
FU1	ANY Loss or ANY Potential Loss of Containment MODE: Power Operation, Hot Standby, Startup, Hot Shutdown	None	<u>ANY</u> loss or <u>ANY</u> potential loss of Containment OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	See discussion of point system in Table 4.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	ANY Loss or ANY Potential Loss of Containment	None	<u>ANY</u> loss or <u>ANY</u> potential loss of Containment	See discussion of point system in Table 4.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
FA1	ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS MODE: Power Operation, Hot Standby, Startup, Hot Shutdown	None	<u>ANY</u> loss or <u>ANY</u> potential loss of either Fuel Clad or RCS OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	See discussion of point system in Table 4.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	None	<u>ANY</u> loss or <u>ANY</u> potential loss of either Fuel Clad or RCS	See discussion of point system in Table 4.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
FS1	Loss or Potential Loss of ANY Two Barriers MODE: Power Operation, Hot	None	Loss or potential loss of <u>ANY</u> two barriers OPCON: 1 - Power Operations, 2	See discussion of point system in Table 4.

EAL Comparison Matrix

OSSI HCGS

Standby, Startup, Hot Shutdown	- Startup, 3 - Hot Shutdown
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NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Loss or Potential Loss of ANY Two Barriers	None	Loss or potential loss of <b>ANY</b> two barriers  <b>OR</b> Potential loss of 2 barriers with the loss of the 3rd barrier	The condition "OR Potential loss of 2 barriers with the loss of the 3rd barrier" has been added for clarification.  See discussion of point system in Table 4.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
FG1	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier  MODE: Power Operation, Hot Standby, Startup, Hot Shutdown	None	Loss of <b>ANY</b> two barriers <b>AND</b> loss or potential loss of third barrier  OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	See discussion of point system in Table 4.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier	None	Loss of <b>ANY</b> two barriers  <b>AND</b> Loss or potential loss of third barrier	See discussion of point system in Table 4.

**Table 4 – Classification of Fission Product Barriers with the Point System**

A point system is used to determine the Emergency Classification Level based on the Fission Product Barrier Table. Each Fission Product Barrier Loss and Potential Loss threshold is assigned a point value as noted below.

Points	Barrier Degradation
5	Fuel Clad Loss RCS Loss
4	Fuel Clad Potential Loss RCS Potential Loss
3	Containment Loss
2	Containment Potential Loss

Classification instructions:

1. Review all columns of the Fission Product Barrier Table and identify which need further review.
2. For each of the three barriers, determine the EAL with the highest point value. No more than one EAL should be selected for each barrier.
3. Add the point values for the three barriers.
4. Classify based on the point value sum as follows:

If the sum is:	Classify as:	EAL	ECG Att#
2, 3	UNUSUAL EVENT	<u>ANY</u> loss or <u>ANY</u> potential loss of Containment	1
4, 5	ALERT	<u>ANY</u> loss or <u>ANY</u> potential loss of either Fuel Clad or RCS	2
6 - 11	SITE AREA EMERGENCY	Loss or potential loss of <u>ANY</u> two barriers <b>OR</b> Potential loss of 2 barriers with the loss of the 3rd	3

		barrier	
12, 13	GENERAL EMERGENCY	Loss of <b>ANY</b> two barriers <b>AND</b> Loss or potential loss of third barrier	4

5. Implement the appropriate ECG Attachment.
6. Continue to review the Fission Product Barrier Table for changes that could result in emergency escalation or de-escalation



**Hope Creek – Fission Product Barrier Table**

FPB Category	Fuel Clad Barrier		RCS Barrier		Containment Barrier	
	Potential Loss (4 pts)	Loss (5 pts)	Potential Loss (4 pts)	Loss (5 pts)	Potential Loss (2 pt)	Loss (3 pts)
<b>RPV Level</b>	<p><b>FB1-P</b> RPV level CANNOT be restored and maintained above -161 in. <b>OR</b> RPV level CANNOT be determined</p>	<p><b>FB1-L</b> Primary Containment Flooding is required as indicated by <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>RPV level CANNOT be restored and maintained above -185 in.</li> <li>RPV level CANNOT be determined <b>AND</b> it is determined that core damage is occurring</li> </ul>	none	<p><b>RB1-L</b> RPV level CANNOT be restored and maintained above -161 in. <b>OR</b> RPV level CANNOT be determined</p>	<p><b>CB1-P</b> Primary Containment Flooding is required as indicated by <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>RPV level CANNOT be restored and maintained above -185 in.</li> <li>RPV level CANNOT be determined <b>AND</b> it is determined that core damage is occurring</li> </ul>	none
<b>RPV / Drywell Pressure / Temperature / H<sub>2</sub> &amp; O<sub>2</sub> Levels</b>	none	none	none	<p><b>RB2-L</b> Drywell pressure &gt; 1.68 psig due to RCS leakage</p>	<p><b>CB2-P</b> Drywell pressure &gt; 62 psig and rising</p> <hr/> <p><b>CB3-P</b> Indications of ≥ 6% H<sub>2</sub> and ≥ 5% O<sub>2</sub> in Drywell or Torus</p> <hr/> <p><b>CB4-P</b> RPV pressure and suppression pool temperature CANNOT be maintained below the HCTL (EOP Curve SPT-P)</p>	<p><b>CB1-L</b> Drywell pressure rise followed by a rapid unexplained drop in Drywell pressure</p> <hr/> <p><b>CB2-L</b> Drywell pressure response NOT consistent with LOCA conditions</p>

Hope Creek – Fission Product Barrier Table

FPB Category	Fuel Clad Barrier		RCS Barrier		Containment Barrier	
	Potential Loss (4 pts)	Loss (5 pts)	Potential Loss (4 pts)	Loss (5 pts)	Potential Loss (2 pt)	Loss (3 pts)
RCS Leakage, Leak Isolation, PC Venting	none	none	<b>RB1-P</b> RCS leakage > 50 gpm inside the drywell	<b>RB3-L</b> VALID isolation signal exists with an <b>UNISOLABLE</b> Break outside primary containment (after isolation from the Control Room has or should have been attempted) in <b>ANY</b> of the following systems: <ul style="list-style-type: none"> <li>• Main steam line</li> <li>• HPCI steam line</li> <li>• RCIC steam line</li> <li>• RWCU</li> <li>• Feedwater</li> </ul>	none	<b>CB3-L</b> <b>UNISOLABLE</b> primary system leakage outside primary containment (after isolation from the Control Room has or should have been attempted) <b>AND</b> Direct downstream pathway to the environment exists
			<b>RB2-P</b> <b>UNISOLABLE</b> primary system leakage outside primary containment (after isolation from the Control Room has or should have been attempted) as indicated by exceeding <b>EITHER</b> of the following: <ul style="list-style-type: none"> <li>• <b>ANY</b> EOP 103 Reactor Bldg room temperature Table 1, Column 1</li> <li>• <b>ANY</b> EOP 103 Reactor Bldg local rad monitoring alarm</li> </ul>	<b>RB4-L</b> Emergency RPV Depressurization is required		<b>CB4-L</b> Intentional primary containment venting per EOPs

Hope Creek – Fission Product Barrier Table

FPB Category	Fuel Clad Barrier		RCS Barrier		Containment Barrier	
	Potential Loss (4 pts)	Loss (5 pts)	Potential Loss (4 pts)	Loss (5 pts)	Potential Loss (2 pt)	Loss (3 pts)
						<p><b>CB5-L</b>  <b>UNISOLABLE</b> primary system leakage outside primary containment (after isolation from the Control Room has or should have been attempted) as indicated by exceeding <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• <b>ANY</b> EOP 103 Reactor Bldg room temperature Table 1, Column 2</li> <li>• <b>ANY</b> Reactor Bldg rad level &gt; 1000 times normal</li> </ul>
Radiation	none	<p><b>FB2-L</b>  <b>ANY</b> DAPA Radiation Monitor reading <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• With drywell sprays, ≥ 2000 R/hr</li> <li>• Without drywell sprays, ≥ 4000 R/hr</li> </ul> <hr/> <p><b>FB3-L</b>  Coolant activity &gt; 300 µCi/gm dose equivalent I-131</p>	none	none	<p><b>CB5-P</b>  <b>ANY</b> DAPA Radiation Monitor reading <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• With drywell sprays, ≥ 10,000 R/hr</li> <li>• Without drywell sprays, ≥ 20,000 R/hr</li> </ul>	none
EC Judgment	<b>FB4-P</b> <b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates potential loss of the Fuel Clad barrier	<b>FB4-L</b> <b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates loss of the Fuel Clad barrier	<b>RB3-P</b> <b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates potential loss of the RCS barrier	<b>RB5-L</b> <b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates loss of the RCS barrier	<b>CB6-P</b> <b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates potential loss of the Containment barrier	<b>CB6-L</b> <b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates loss of the Containment barrier

**Fuel Clad Fission Product Barrier Degradation Thresholds**

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
FC Loss 1	<p><b>Primary Coolant Activity Level</b></p> <p>A. Primary coolant activity greater than (site-specific value).</p>	FB3-L	<p>Primary coolant activity &gt; <b>300 µCi/gm</b> dose equivalent I-131</p>	<p>&gt; 300 µCi/gm dose equivalent I-131 is the site specific coolant activity.</p>
FC Loss 2	<p><b>Reactor Vessel Water Level</b></p> <p>A. RPV water level cannot be restored and maintained above (site specific RPV water level corresponding to the requirement for primary containment flooding).</p>	FB1-L	<p>Primary Containment Flooding is required as indicated by <b><u>EITHER</u></b> of the following:</p> <ul style="list-style-type: none"> <li>• RPV level <b>CANNOT</b> be restored and maintained above <b>-185 in.</b></li> <li>• RPV level <b>CANNOT</b> be determined <b><u>AND</u></b> it is determined that core damage is occurring</li> </ul>	<p>EOPs 101, 101A, 206 and 206A specify the requirements for primary containment flooding, which is accomplished by entry to the SAGs when core cooling is severely challenged. EOP flowchart symbols containing the phrase "SAG entry is required" signal this requirement. These EOPs provide instructions to ensure adequate core cooling by maintaining RPV water level above prescribed limits or operating sufficient RPV injection sources when level cannot be determined. Primary containment flooding (SAG entry) is required when:</p> <ul style="list-style-type: none"> <li>• RPV level cannot be restored and maintained above -185 in.: The Minimum Steam Cooling RPV Water Level (MSCRWL) is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F.</li> <li>• RPV level cannot be determined and it is determined that core damage is occurring.</li> </ul> <p>The above EOP conditions represent a challenge to core cooling and are the minimum values to assure core cooling without further degradation of the clad.</p>
FC Loss 3	N/A	N/A	N/A	

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
FC Loss 4	<p><b>Primary Containment Radiation Monitoring</b></p> <p>A. Primary containment radiation monitor reading greater than (site specific value).</p>	FB2-L	<p><b>ANY</b> DAPA Radiation Monitor reading <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• With drywell sprays, <math>\geq 2000</math> R/hr</li> <li>• Without drywell sprays, <math>\geq 4000</math> R/hr</li> </ul>	<p>The term "<b>ANY</b>" has been added to ensure that classification is not delayed because the threshold is not indicated on both DAPA radiation monitors.</p> <p>Threshold values with and without drywell sprays have been provided because the methodology for core damage assessment utilizes nomograms with and without drywell sprays.</p> <p>Core damage analysis indicates that a reactor coolant activity of 300 <math>\mu\text{Ci/gm}</math> Dose Equivalent Iodine-131 (DEI) corresponds to 4% clad damage. 4% clad damage is indicated by a Drywell Atmosphere Post Accident (DAPA) reading of approximately 2000 R/hr at 1 hr after shutdown (the most conservative) with drywell spray in service, and approximately 4000 R/hr at 1 hr after shutdown with drywell spray not in service.</p>
FC Loss 5	<p><b>Other (Site-Specific) Indications</b></p> <p>A. (site specific ) as applicable</p>		N/A	Other site-specific indications of Fuel Clad loss have not been identified.
FC Loss 6	<p><b>Emergency Director Judgment</b></p> <p>A. Any condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier</p>	FB4-L	<b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates loss of the Fuel Clad barrier	None
FC P-Loss 1	<p><b>Primary Coolant Activity Level</b></p> <p>Not Applicable.</p>	N/A	N/A	

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
FC P-Loss 2	<b>Reactor Vessel Water Level</b> A. RPV water level cannot be restored and maintained above (site specific RPV water level corresponding to the top of active fuel) or cannot be determined.	FB1-P	RPV level CANNOT be restored and maintained above <b>-161 in.</b>  <u>OR</u> RPV level CANNOT be determined	-161 in. is the RPV water level corresponding to the top of active fuel.  The NEI phrase "or cannot be determined" has been changed to " <u>OR</u> RPV level CANNOT be determined" for clarification.
FC P-Loss 3	N/A	N/A	N/A	
FC P-Loss 4	<b>Primary Containment Radiation Monitoring</b> Not Applicable	N/A	N/A	
FC P-Loss 5	<b>Other (Site-Specific) Indications</b> A. (site specific ) as applicable	N/A	N/A	Other site-specific indications of Fuel Clad potential loss have not been identified.
FC P-Loss 6	<b>Emergency Director Judgment</b> A. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier	FB2-P	<u>ANY</u> condition in the opinion of the Emergency Coordinator that indicates potential loss of the Fuel Clad barrier	None

## RCS Fission Product Barrier Degradation Thresholds

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
RCS Loss 1	<p><b>Primary Containment Pressure</b></p> <p>A. Primary containment pressure greater than (site specific value) due to RCS leakage.</p>	RB2-L	Drywell pressure > <b>1.68 psig</b> due to RCS leakage	1.68 psig is the HCGS Primary Containment (PC) high pressure scram setpoint.
RCS Loss 2	<p><b>Reactor Vessel Water Level</b></p> <p>A. RPV water level cannot be restored and maintained above (site specific RPV water level corresponding to the top of active fuel) or cannot be determined.</p>	RB1-L	<p>RPV level CANNOT be restored and maintained above <b>-161 in.</b></p> <p><b>OR</b></p> <p>RPV level CANNOT be determined</p>	<p>-161 in. is the RPV water level corresponding to the top of active fuel.</p> <p>The NEI phrase "or cannot be determined" has been changed to "<b>OR</b> RPV level CANNOT be determined" for clarification.</p>
RCS Loss 3	<p><b>RCS Leak Rate</b></p> <p>A. (site specific Indication of an UNISOLABLE Main Steamline, HPCI, Feedwater, RWCU, or RCIC break)</p> <p>B. Emergency RPV Depressurization is required</p>	RB3-L	<p><b>VALID</b> isolation signal exists with an <b>UNISOLABLE</b> Break outside primary containment (after isolation from the Control Room has or should have been attempted) in <b>ANY</b> of the following systems:</p> <ul style="list-style-type: none"> <li>• Main steam line</li> <li>• HPCI steam line</li> <li>• RCIC steam line</li> <li>• RWCU</li> <li>• Feedwater</li> </ul>	<p>The NEI threshold "(Site-specific) Indication of an unisolable Main Steamline...break" has been changed to "<b>VALID</b> isolation signal exists with an <b>UNISOLABLE</b> Break outside primary containment...in <b>ANY</b> of the following systems:...Main steam line...HPCI steam line...RCIC steam line...RWCU...Feedwater" to clarify NEI intent.</p> <p>The parenthetical phrase "after isolation from the Control Room has or should have been attempted" has been added to the HCGS EAL to emphasize the meaning of "promptly" as stated in the NEI definition of UNISOLABLE. In accordance with NEI basis discussion, prompt isolation attempts include automatic isolation and manual action in the Control Room to close isolation valves.</p>

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
		RB4-L	Emergency RPV Depressurization is required	None
RCS Loss 4	<b>Primary Containment Radiation Monitoring</b> A. Primary containment radiation monitor reading greater than (site specific value).	N/A	None	This RCS Loss has been deleted. Radiation levels indicative of the dispersal of reactor coolant activity at the Technical Specification limit (~0.1% clad damage) are so low that they cannot be read on the DAPA radiation monitors. These monitors are equipped with a source that ensures an onscale reading. The radiation levels equivalent to the NEI 99-01 threshold would be offscale-low or masked by the check source. There are no other radiation monitors that can be used for this purpose.  Due to the inability of the DAPA radiation monitors to distinguish between a cloud of released RCS gases and shine from the reactor vessel and adjacent piping/components, this RCS Loss is being omitted as permitted by NEI 99-01. Other indications of RCS leakage are being used. It should be recognized that DAPA exceeding 2000 R/hr would most likely occur due to core uncover as RPV water level decreases below the top of active fuel. This condition will result in appropriate escalation to a SAE in the Fission Product Barrier Table, and hence the use of DAPA is not needed to detect a loss of RCS barrier.
RCS Loss 5	<b>Other Site-Specific Indications</b> <u>A.</u> (site specific) as applicable	N/A	N/A	Other site-specific indications of RCS loss have not been identified.
RCS Loss 6	<b>Emergency Director Judgment</b> A. Any condition in the opinion of the Emergency Director that indicate Loss of the RCS Barrier	RB5-L	<b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates loss of the RCS barrier	None
RCS P-Loss 1	<b>Primary Containment Pressure</b> Not Applicable	N/A	N/A	



NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
RCS P-Loss 2	<b>Reactor Vessel Water Level</b> Not applicable	N/A	N/A	
RCS P-Loss 3	<b>RCS Leak Rate</b> A. RCS leakage GREATER THAN 50 gpm inside the drywell  OR B. UNISOLABLE primary system leakage outside primary containment as indicated by exceeding EITHER of the following: a. Max Normal Operating Temperature.  OR b. Max Normal Area Radiation.	RB1-P	RCS leakage > <b>50 gpm</b> inside the drywell	None
		RB2-P	<b>UNISOLABLE</b> primary system leakage outside primary containment (after isolation from the Control Room has or should have been attempted) as indicated by exceeding <b>EITHER</b> of the following:  • <b>ANY</b> EOP 103 Reactor Bldg room temperature Table 1, Column 1  • <b>ANY</b> EOP 103 Reactor Bldg local rad monitoring alarm	The parenthetical phrase "after isolation from the Control Room has or should have been attempted" has been added to the HCGS EAL to emphasize the meaning of "promptly" as stated in the NEI definition of UNISOLABLE. In accordance with NEI basis discussion, prompt isolation attempts include automatic isolation and manual action in the Control Room to close isolation valves.  The entry conditions to EOP flowchart 103 for Reactor Bldg room temperature and local rad monitoring alarms are the HCGS Max Normal Operating Temperature and Max Normal Area Radiation.
RCS P-Loss 4	<b>Primary Containment Radiation Monitoring</b> Not applicable	N/A	N/A	
RCS P-Loss 5	<b>Other Site Specific Indications</b> A. (site specific ) as applicable	N/A	N/A	Other site-specific indications of RCS potential loss have not been identified.
RCS P-Loss 6	<b>Emergency Director Judgment</b> A. Any condition in the opinion of the Emergency Director that indicate Potential Loss of the RCS Barrier	RB3-P	<b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates potential loss of the RCS barrier	None

**Containment Fission Product Barrier Degradation Thresholds**

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
CMT Loss 1	<p><b>Primary Containment Conditions</b></p> <p>A. Primary containment pressure rise followed by a rapid unexplained drop in primary containment pressure.</p>	CB1-L	Drywell Pressure rise followed by a rapid unexplained drop in Drywell pressure	The NEI phrase "Primary containment" has been changed to "Drywell" because the instrumentation used to monitor primary containment pressure is the drywell pressure instrumentation.
	<p><b>OR</b></p> <p>B. Primary containment pressure response not consistent with LOCA conditions.</p>	CB2-L	Drywell pressure response NOT consistent with LOCA conditions	The NEI phrase "Primary containment" has been changed to "Drywell" because the instrumentation used to monitor primary containment pressure is the drywell pressure instrumentation.
CMT Loss 2	<p><b>Reactor Vessel Water Level</b></p> <p>Not applicable</p>	N/A	N/A	
CMT Loss 3	<p><b>Primary Containment Isolation Failure or Bypass</b></p> <p>A. Failure of all valves in any one line to close.  <b>AND</b>                      Direct downstream pathway to the environment exists after primary containment isolation signal.  <b>OR</b></p> <p>B. Intentional primary containment venting per EOPs.  <b>OR</b></p> <p>C. UNISOLABLE primary system leakage outside primary containment as indicated by exceeding EITHER of the following:                      a. Max Safe Operating</p>	CB3-L	<p><b>UNISOLABLE</b> leakage outside primary containment (after isolation from the Control Room has or should have been attempted)</p> <p><b>AND</b></p> <p>Direct downstream pathway to the environment exists</p>	<p>The NEI phrase "Failure of all valves in any one line to close...after primary containment isolation signal" has been changed to "UNISOLABLE leakage outside primary containment..." By definition, a failure of all valves in any one line penetrating the primary containment to close may produce unisolable leakage outside the primary containment.</p> <p>The parenthetical phrase "after isolation from the Control Room has or should have been attempted" has been added to the HCGS EAL to emphasize the meaning of "promptly" as stated in the NEI definition of UNISOLABLE. In accordance with NEI basis discussion, prompt isolation attempts include automatic isolation and manual action in the Control Room to close isolation valves.</p>
	<p>a. Max Safe Operating</p>	CB4-L	Intentional primary containment venting per EOPs	None

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
	Temperature. <b>OR</b> b. Mx Safe Area Radiation.	CB5-L	<b>UNISOLABLE</b> primary system leakage outside primary containment (after isolation from the Control Room has or should have been attempted) as indicated by exceeding <b>EITHER</b> of the following: <ul style="list-style-type: none"> <li>• <b>ANY</b> EOP 103 Reactor Bldg room temperature Table 1, Column 2</li> <li>• <b>ANY</b> Reactor Bldg rad level &gt; 1000 times normal</li> </ul>	The parenthetical phrase “after isolation from the Control Room has or should have been attempted” has been added to the HCGS EAL to emphasize the meaning of “promptly” as stated in the NEI definition of UNISOLABLE. In accordance with NEI basis discussion, prompt isolation attempts include automatic isolation and manual action in the Control Room to close isolation valves.  The EOP flowchart 103 Table 1, Column 2, temperatures are the HCGS Max Safe Operating Temperatures.  Reactor Bldg rad levels > 1000 times normal are the HCGS Max Safe Area Radiation levels specified in EOP flowchart 103.
CMT Loss 4	<b>Primary Containment Radiation Monitoring</b>  Not applicable	N/A	N/A	
CMT Loss 5	<b>Other Site Specific Indications</b> A. (site specific ) as applicable	N/A	N/A	Other site-specific indications of Containment loss have not been identified.
CMT Loss 6	<b>Emergency Director Judgment</b> A. Any condition in the opinion of the Emergency Director that indicates Loss of the Containment barrier	CB6-L	<b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates loss of the Containment barrier	None
CMT P-Loss 1	<b>Primary Containment Conditions</b> A. Primary containment pressure greater than (site specific value) and rising. <b>OR</b> B. Explosive mixture exists inside	CB2-P	Drywell Pressure > <b>62 psig</b> and rising	The NEI phrase “Primary containment” has been changed to “Drywell” because the instrumentation used to monitor primary containment pressure is the drywell pressure instrumentation.  62 psig is the primary containment internal design pressure.

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
	primary containment. <b>OR</b> C. RPV pressure and suppression pool temperature cannot be maintained below the HCTL.	CB3-P	Indications of $\geq 6\% \text{ H}_2$ and $\geq 5\% \text{ O}_2$ in Drywell or Torus	The NEI threshold "Explosive mixture exists" has been changed to "Indications of $\geq 6\% \text{ H}_2$ and $\geq 5\% \text{ O}_2$ in Drywell or Torus" for clarification. The BWROG EPGs/SAGs specifically define the limits associated with explosive mixtures in terms of deflagration concentrations of hydrogen and oxygen inside the drywell and suppression chamber.
		CB4-P	RPV pressure and suppression pool temperature CANNOT be maintained below the HCTL (EOP Curve SPT-P)	Reference to the EOP curve that illustrates the HCTL has been added for clarification.
CMT P-Loss 2	<b>Reactor Vessel Water Level</b> A. Primary containment flooding required	CB1-P	Primary Containment Flooding is required as indicated by <b><u>EITHER</u></b> of the following: <ul style="list-style-type: none"> <li>• RPV level CANNOT be restored and maintained above <b>-185 in.</b></li> <li>• RPV level CANNOT be determined <b><u>AND</u></b> it is determined that core damage is occurring</li> </ul>	The NEI phrase "Primary containment flooding required" has been changed to include the threshold values given in EOPs 101, 101A, 206 and 206A that specify the requirement for primary containment flooding. This change is for clarification and consistency with FB1-L.  EOP flowchart symbols containing the phrase "SAG entry is required" signal the requirement for primary containment flooding. These EOPs provide instructions to ensure adequate core cooling by maintaining RPV water level above prescribed limits or operating sufficient RPV injection sources when level cannot be determined. Primary containment flooding (SAG entry) is required when: <ul style="list-style-type: none"> <li>• RPV level cannot be restored and maintained above -185 in.: The Minimum Steam Cooling RPV Water Level (MSCRWL) is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F.</li> </ul>

NEI FPB#	NEI IC Wording	HCGS FPB #(s)	HCGS FPB Wording	Difference/Deviation Justification
				<ul style="list-style-type: none"> <li>• RPV level cannot be determined and it is determined that core damage is occurring.</li> </ul>
CMT P-Loss 3	<p><b>Primary Containment Isolation Failure or Bypass</b></p> <p>Not applicable</p>	N/A	N/A	
CMT P-Loss 4	<p><b>Primary Containment Radiation Monitoring</b></p> <p>A. Primary containment radiation monitor reading greater than (site specific value).</p>	CB5-P	<p><b>ANY</b> DAPA Radiation Monitor reading <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• With drywell sprays, <b>≥ 10,000 R/hr</b></li> <li>• Without drywell sprays, <b>≥ 20,000 R/hr</b></li> </ul>	<p>The term "<b>ANY</b>" has been added to ensure that classification is not delayed because the threshold is not indicated on both DAPA radiation monitors.</p> <p>Threshold values with and without drywell sprays have been provided because the methodology for core damage assessment utilizes nomograms with and without drywell sprays.</p> <p>Core damage analysis indicates that 20% clad damage corresponds to a DAPA reading of 10,000 R/hr with drywell sprays and 20,000 R/hr without drywell sprays.</p>
CMT P-Loss 5	<p><b>Other Site Specific) Indications</b></p> <p>A. (site specific) as applicable</p>	N/A	N/A	Other site-specific indications of Containment potential loss have not been identified.
CMT P-Loss 6	<p><b>Emergency Director Judgment</b></p> <p>A. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment barrier</p>	CB6-P	<p><b>ANY</b> condition in the opinion of the Emergency Coordinator that indicates potential loss of the Containment barrier</p>	None

**Category H**

**Hazards and Other Conditions Affecting Plant Safety**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HU1	Natural or destructive phenomena affecting the PROTECTED AREA MODE: All	HU1	Natural or destructive phenomena affecting the <b>PROTECTED AREA</b> OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Seismic event identified by <b>ANY</b> 2 of the following: <ul style="list-style-type: none"> <li>Seismic event confirmed by (site specific indication or method))</li> <li>Earthquake felt in plant</li> <li>National Earthquake Center</li> </ul>	HU1.1	Seismic event identified by <b>ANY</b> two of the following: <ul style="list-style-type: none"> <li>Earthquake felt in plant by Control Room Operators</li> <li>SMA-3 Event Indicator (flag) white on Panel 10C673</li> <li>National Earthquake Information Center (NEIC) (Note 4)</li> </ul> Note 4: The NEIC can be contacted by calling (303) 273-8500. Select option #1 and inform the analyst you wish to confirm recent seismic activity in the vicinity of Salem/Hope Creek Generating Station. Provide the analyst with the following coordinates: 39° 27' 46" (39.465°) north latitude, 75° 32' 08" (75.537°) west longitude.	The phrase "by Control Room Operators" has been added for clarification. The NEI basis defines a felt earthquake as one having been "recognized as an earthquake based on a consensus of control room operators on duty at the time."  SMA-3 flag is the HCGS specific method of confirming a felt earthquake.  The NEI phrase "National Earthquake Center" has been changed to "National Earthquake Information Center" to reflect the proper title of this organization.  Note 4 provides guidance for contacting the NEIC and obtaining confirmation of seismic activity at the SGS/HCGS site.
2	Tornado striking within PROTECTED AREA boundary or high winds greater than (site specific mph).	HU1.2	Tornado <b>TOUCHING DOWN</b> within the <b>PROTECTED AREA</b>  <b>OR</b> Average Wind Speeds > <b>95 MPH</b> from	The NEI term "striking" has been changed to "TOUCHING DOWN" for clarification and consistency with the NEI basis definition of "striking."  The design wind velocities are 108 mph (including a gust factor of approximately 1.3) at 30 feet above ground for

			<u>ANY</u> elevation of the Met Tower	<p>Seismic Category I structures. However, wind speed indication is limited to 100 mph in the Control Room so the wind speed threshold has been capped at 95 mph to provide margin to the upper limit of the indicated range.</p> <p>The phrase "Average Wind Speeds...from <u>ANY</u> elevation of the Met Tower" has been added to clarify the sources from which wind speed information may be obtained. The SPDS display provides wind speed readings on a 15-minute average.</p>
3	<p>Internal flooding that has the potential to affect safety related equipment required by Technical Specifications for the current operating mode in <u>ANY</u> of the following areas:</p> <p>(site specific area list)</p>	HU1.4	<p>Visual Observation of <b>Flooding</b> in <u>ANY</u> Table H-1 structures that confirms <u>ANY</u> of the following:</p> <ul style="list-style-type: none"> <li>• Reactor Building Floor Levels above the Maximum Normal Floor Level (&gt; 1 in.) referenced in EOP 103 / 104, Reactor Building and Radioactive Release Control</li> <li>• Receipt of SSWS Pump Room Flooded Alarm A1-B2 (PUMP ROOM FLOODED)</li> <li>• Greater than 2 in. of water in <u>ANY</u> other area that contains a <b>Safety System(s)</b></li> </ul> <p><b>AND</b></p> <p>The Safety Related Equipment is required by Technical Specifications for the present operational condition (OPCON)</p>	<p>The HCGS (site-specific) areas of the plant are listed in Table H-1.</p> <p>The NEI phrase "Internal flooding that has the potential to affect safety related equipment..." has been changed to "Visual Observation of <b>Flooding</b>...that confirms <u>ANY</u> of the following: [three bulleted conditions]" to provide explicit criteria by which the EAL-user can assess internal flooding that may affect safety related equipment.</p> <p>For the purpose of implementing this EAL, levels in the Reactor Building that would require classification under this EAL are defined as the Maximum Normal Floor Level in the EOPs. Exceeding this level in any of the Reactor Building areas would require running all available sump pumps. If level in these areas cannot be lowered to below the 1 in. level, systems discharging into this area are to be isolated, except for systems required to:</p> <ul style="list-style-type: none"> <li>• Ensure adequate core cooling</li> <li>• Shutdown the reactor</li> <li>• Protect primary containment integrity</li> <li>• Suppress a fire</li> </ul> <p>Overhead Annunciator A1-B2 (PUMP ROOM FLOODED) is fed from the following CRID points: D5518, D5519, D5533 and D5534.</p>
4	Turbine failure resulting in casing penetration or damage to turbine	HU1.3	Main Turbine rotating component failures	The NEI phrase "Turbine" has been changed to "Main Turbine" to clarify that the EAL does not apply to other



	or generator seals		resulting in <b><u>EITHER</u></b> of the following: <ul style="list-style-type: none"> <li>• Main Turbine casing penetration</li> <li>• Main Turbine or Generator Seal Damage</li> </ul>	turbine-driven equipment such as the HPCI and RCIC turbines. The NEI term “failure” has been expanded to “Main Turbine rotating component failures” for consistency with the NEI basis that discusses the concerns associated with main turbine rotor failures.
5	(Site specific occurrences affecting the PROTECTED AREA)	HU1.5	River level > 99.5' <b><u>OR</u></b> River level < 80.0'	River level greater than 99.5' (+10.5' MSL) is indication of impending site flood conditions. River level < 80.0' (-9.0'MSL) is indication of approaching loss of the Ultimate Heat Sink.

**Table H-1 Plant Structures Containing Safe Shutdown Systems or Components**

- Reactor Building
- Control/Auxiliary Building
- Service Water Intake Structure
- Service/Radwaste Building

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HU2	FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA. MODE: All	HU2	FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>FIRE not extinguished within 15 minutes of control room notification or verification of a control room FIRE alarm in <b>ANY</b> of the following areas:</p> <p>(Site-specific area list)</p> <p><b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the duration has exceeded, or will likely exceed, the applicable time.</p>	HU2.1	<p>FIRE NOT extinguished within 15 minutes of <u>EITHER</u> of the following:</p> <ul style="list-style-type: none"> <li>• Control Room notification/report of a <b>FIRE</b></li> <li>• Verified <b>FIRE</b> detection system alarm/actuation</li> </ul> <p><b>AND</b></p> <p><b>FIRE</b> is located in the Turbine Building or <b>ANY Table H-1</b> plant structure (Note 3)</p> <p>Note 3: 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 will likely exceed the applicable time.</p>	<p>The NEI phrase “control room notification or verification of a control room FIRE alarm” has been reformatted with minor wording changes for clarification.</p> <p>The NEI bases has been modified to better define when the 15-minute EAL Assessment clock starts for (1) cases that include the receipt of nearby independent fire alarms and (2) cases that involve only a single alarm where on-scene fire confirmation would be the threshold used to start the 15-minute EAL assessment clock. <b>This is a potential deviation from NEI 99-01 Revision 5.</b></p> <p>The phrase “...the Turbine Building or <b>ANY Table H-1</b>...” has been added for consistency with the NEI basis that indicates the EAL applies to fires in vital areas or areas immediately adjacent to vital areas or other significant buildings or areas. Table H-1 lists plant structures containing safe shutdown systems or components. These are vital areas and areas immediately adjacent to vital areas and other significant buildings and areas.</p>

2	EXPLOSION within the PROTECTED AREA.	HU2.2	EXPLOSION within the PROTECTED AREA	None
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**Table H-1 Plant Structures Containing Safe Shutdown Systems or Components**

- Reactor Building
- Control/Auxiliary Building
- Service Water Intake Structure
- Service/Radwaste Building

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HU3	Release of toxic, corrosive, asphyxiant, or flammable gases deemed detrimental to <b>NORMAL PLANT OPERATIONS</b> MODE: All	HU3	Release of toxic, corrosive, asphyxiant or flammable gases deemed detrimental to <b>NORMAL PLANT OPERATIONS</b> OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect <b>NORMAL PLANT OPERATIONS</b>	HU3.1	Release of toxic, corrosive, asphyxiant or flammable gas in amounts (excluding small or incidental releases) that have or could adversely affect <b>NORMAL PLANT OPERATIONS</b>	The phrase “(excluding small or incidental releases)” has been added to the HCGS EAL for clarification consistent with the EAL basis . The NEI basis for this EAL states: “This would preclude small or incidental releases, or releases that do not impact structures needed for plant operation.”
2	Report by Local, County or State Officials for evacuation or sheltering of site personnel based on an offsite event	HU3.2	Notification by Local, County, or State Officials for evacuation or sheltering of site personnel based on an <b>off-site gas release event</b> that includes toxic, corrosive, asphyxiant, or flammable gas	The NEI term “Report” has been replaced with “Notification” for consistency with use of the term “Notification” in EALs HU4.1 and HA4.1.  The NEI phrase “offsite event” has been replaced with “ <b>off-site gas release event</b> that includes toxic, corrosive, asphyxiant, or flammable gas” to clarify the type of events intended to be classified under this EAL by the NEI IC wording and NEI basis discussion.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HU4	Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant MODE: All	HU4	Confirmed <b>SECURITY CONDITION</b> or threat which indicates a potential degradation in the level of safety of the plant OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	A SECURITY CONDITION that does NOT involve a HOSTILE ACTION as reported by the (site specific security shift supervision)	HU4.1	A <b>SECURITY CONDITION</b> that does NOT involve a <b>HOSTILE ACTION</b> as reported by the Security Operations Supervisor or designee (Note 9)	<p>The NEI Example EALs have been combined in one plant EAL. The "Security Shift Supervision" is the Security Operations Supervisor or designee.</p> <p>The NEI phrase "A credible...security threat notification" has been changed to "Receipt of a <b>CREDIBLE/ACTUAL THREAT</b>... – (determined by security in accordance with SY-AA-101-132, "Threat Assessment")" for clarification. Threats are evaluated by security per Threat Assessment, SY-AA-101-132.</p> <p>Changed the NEI phrase "site specific" to "Salem or Hope Creek station" to clarify the intent of the EAL as described in the NEI basis.</p> <p>Added the phrase "Salem/Hope Creek" to the third threshold to clarify the intent of the EAL as described in the NEI basis and for consistency with the use of "site-specific" in the second NEI Example EAL.</p> <p>Added Note 9 to provide guidance to implement immediate security based response actions prior to declaring the security based emergency and to obtain critical information of the nature of the security event.</p>
2	A credible site specific security threat notification		<p><u>OR</u></p> <p>Receipt of a <b>CREDIBLE/ACTUAL THREAT</b> to Salem or Hope Creek station – (determined by security in accordance with SY-AA-101-132, "Threat Assessment") (Note 9)</p>	
3	A validated notification from NRC providing information of an aircraft threat		<p><u>OR</u></p> <p>A <b>VALIDATED</b> notification from NRC providing information of a Salem/Hope Creek <b>AIRCRAFT</b> threat (Note 9)</p> <p>NOTE 9: Shift Manager (SM) should implement the Prompt Actions of NC.EP-EP.ZZ-0102, EC Response, Attachment 10, prior to classification of a</p>	

			<p>security emergency.</p> <p>Key Information to obtain from Security Supervision upon SM notification of a security event:</p> <ul style="list-style-type: none"><li>• Determination if the security event is a <b>HOSTILE ACTION</b> or <b>SECURITY CONDITION</b></li><li>• If a <b>HOSTILE ACTION</b>, is location the <b>OCA</b> or <b>PA</b>?</li></ul>	
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HU5	Other conditions exist which in the judgment of the Emergency Director warrant declaration of a NOUE MODE: All	HU6	Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of an UNUSUAL EVENT OPCON: All	The NEI abbreviation "NOUE" has been changed to "UNUSUAL EVENT" for consistency with other EAL terminology associated with the titles of emergency classification levels.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation 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 off-site response or monitoring are expected unless further degradation of safety systems occurs.	HU6.1	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 off-site response or monitoring are expected unless further degradation of safety systems occurs	None

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HA1	Natural or destructive phenomena affecting VITAL AREAS MODE: All	HA1	Natural or destructive phenomena affecting vital areas OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>a. Seismic event greater than Operating Basis Earthquake (OBE) as indicated by (site specific seismic instrumentation) reading (site specific OBE limit).</p> <p><b>AND</b></p> <p>b. Earthquake confirmed by <b>ANY</b> of the following:</p> <ul style="list-style-type: none"> <li>• Earthquake felt in plant</li> <li>• National Earthquake Center</li> <li>• Control Room indication of degraded performance of systems required for the safe shutdown of the plant.</li> </ul>	HA1.1	<p>Actuation of the OBE Seismic Switch (&gt; 0.1 g) as indicated by <b><u>EITHER</u></b>:</p> <ul style="list-style-type: none"> <li>• Annunciator C6-C4 (SEISMIC MON PNL C673) activated</li> <li>• Amber alarm light on the Seismic Switch Power Supply Drawer Panel 10C673</li> </ul> <p><b><u>AND</u></b></p> <p>Earthquake confirmed by <b><u>ANY</u></b> of the following:</p> <ul style="list-style-type: none"> <li>• Earthquake felt in plant by Control Room Operators</li> <li>• National Earthquake Information Center (NEIC) (Note 4)</li> <li>• Control Room indication of <b>DEGRADED PERFORMANCE</b> of safe shutdown systems</li> </ul> <p>Note 4: The NEIC can be</p>	<p>The amber Seismic Switch Event Alarm on the Seismic Switch Power Supply (SP-1) will illuminate at an acceleration equal to or exceeding 0.1 g [OBE]. This also annunciates the seismic activity alarm C6-C4 (SEISMIC MON PNL C673). Three time-history triaxial acceleration sensors are provided. These sensors transmit electrical signals to the Control Room where they are recorded on magnetic tape. These tapes are analyzed to determine the exact magnitude of the seismic event and to confirm whether the OBE has been exceeded.</p> <p>The phrase “by Control Room Operators” has been added for clarification. The NEI basis for IC HU1 defines a felt earthquake as one having been “recognized as an earthquake based on a consensus of control room operators on duty at the time.”</p> <p>The NEI phrase “National Earthquake Center” has been changed to “National Earthquake Information Center” to reflect the proper title of this agency.</p> <p>The NEI phrase “systems required for safe shutdown of the plant” has been changed to “safe shutdown systems.”</p> <p>Note 4 provides guidance for contacting the NEIC and obtaining confirmation of seismic activity at the SGS/HCGS site.</p>



			<p>contacted by calling (303) 273-8500. Select option #1 and inform the analyst you wish to confirm recent seismic activity in the vicinity of Salem/Hope Creek Generating Station. Provide the analyst with the following coordinates: 39° 27' 46" (39.465°) north latitude, 75° 32' 08" (75.537°) west longitude.</p>	
2	<p>Tornado striking or high winds greater than (site specific mph) resulting in <b>VISIBLE DAMAGE</b> to <b>ANY</b> of the following structures containing safety systems or components <b>OR</b> control room indication of degraded performance of those safety systems:</p> <p>(site specific structure list)</p>	HA1.2	<p>Tornado <b>TOUCHING DOWN</b> within the <b>PROTECTED AREA</b></p> <p><b>OR</b></p> <p>Average Wind Speeds &gt; <b>95 MPH</b> from <b>ANY</b> elevation of the Met Tower</p> <p><b>AND</b></p> <p>Resulting in <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>Control Room indication of <b>DEGRADED PERFORMANCE</b> of a Safety System</li> <li><b>VISIBLE DAMAGE</b> to <b>ANY</b> of the <b>plant structures</b> in <b>Table H-1</b></li> </ul>	<p>The NEI term "striking" has been changed to "<b>TOUCHING DOWN</b>" for clarification and consistency with the NEI basis definition of "striking."</p> <p>The design wind velocities are 108 mph (including a gust factor of approximately 1.3) at 30 feet above ground for Seismic Category I structures. However, wind speed indication is limited to 100 mph in the Control Room so the wind speed threshold has been capped at 95 mph to provide margin to the upper limit of the indicated range.</p> <p>The phrase "Average Wind Speeds...from <b>ANY</b> elevation of the Met Tower" has been added to clarify the sources from which wind speed information may be obtained. The SPDS display provides wind speed readings on a 15-minute average.</p> <p>Table H-1 contains the site specific structure list.</p> <p>The NEI phrase "those safety systems" has been changed to "a Safety System" because it is clear from the introductory phrase "Resulting in..." that the degraded performance applies only to a safety system affected by the tornado or high winds.</p>
3	<p>Internal flooding in <b>ANY</b> of the following areas resulting in an electrical shock hazard that precludes access to operate or monitor safety equipment <b>OR</b></p>	HA1.4	<p>Visual Observation of <b>Flooding</b> in <b>ANY Table H-1</b> structures that confirms <b>ANY</b> of the following:</p>	<p>The NEI phrase "Internal flooding ..." has been changed to "Visual Observation of Flooding...that confirms <b>ANY</b> of the following: [three bulleted conditions]" to provide explicit criteria by which the EAL-user can assess internal flooding that may affect safety</p>

	<p>control room indication of degraded performance of those safety systems: (site specific area list)</p>		<ul style="list-style-type: none"> <li>Reactor Building Floor Levels above the Maximum Normal Floor Level (&gt; 1 in.) referenced in EOP 103 / 104, Reactor Building and Radioactive Release Control</li> <li>Receipt of SSWS Pump Room Flooded Alarm A1-B2 (PUMP ROOM FLOODED)</li> <li>Greater than 2 in. of water in <b>ANY</b> other area that contains a <b>Safety System(s)</b></li> </ul> <p><b>AND</b></p> <p>The <b>Flooding</b> is of a magnitude that results in <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>Indication of <b>DEGRADED PERFORMANCE</b> of a <b>Safety System</b> within a <b>Table H-1</b> Structure.</li> <li>An Industrial Safety Hazard (Electrical Shock, High Temp, etc.) resulting in access restrictions to operate or monitor <b>Safety System</b> equipment.</li> </ul>	<p>related equipment.</p> <p>For the purpose of implementing this EAL, levels in the Reactor Building that would require classification under this EAL are defined as the Maximum Normal Floor Level in the EOPs. Exceeding this level in any of the Reactor Building areas would require running all available sump pumps. If level in these areas cannot be lowered to below the 1 in. level, systems discharging into this area are to be isolated, except for systems required to:</p> <ul style="list-style-type: none"> <li>Ensure adequate core cooling</li> <li>Shutdown the reactor</li> <li>Protect primary containment integrity</li> <li>Suppress a fire</li> </ul> <p>Overhead Annunciator A1-B2 (PUMP ROOM FLOODED) is fed from the following CRID points: D5518, D5519, D5533 and D5534.</p> <p>The HCGS (site-specific) areas of the plant are listed in Table H-1.</p> <p>The NEI phrase “resulting in” has been changed to “<b>AND</b> The <b>Flooding</b> is of a magnitude that results in <b>EITHER</b> of the following” for clarification.</p> <p>The NEI phrase “an electrical shock hazard” has been changed to “An Industrial Safety Hazard (Electrical Shock, High Temp, etc.)” for clarification and consistency with the NEI basis that explicitly cites electrical shock as only one of many possible industrial safety hazards that could preclude personnel access to operate or monitor equipment.</p> <p>The NEI phrase “those safety systems” has been changed to “<b>Safety System</b> equipment” because it is clear from the introductory phrase “The Flooding is of a magnitude that results in...” that the degraded performance applies only to safety system equipment affected by flooding.</p>
<p>4</p>	<p>Turbine failure-generated <b>PROJECTILES</b> resulting in <b>VISIBLE DAMAGE</b> to or penetration of <b>ANY</b> of the following structures containing</p>	<p>HA1.3</p>	<p>Turbine failure-generated <b>PROJECTILES</b> resulting in <b>EITHER</b> of the following:</p>	<p>Added “...<b>ANY Table H-1</b> plant structures” to be consistent with the generic NEI 99-01 bases that the EAL is intended to address visible damage to structures/equipment “containing functions and systems required for safe shutdown.” Table H-1 is titled “Plant</p>

	<p>safety systems or components <b>OR</b> control room indication of degraded performance of those safety systems:  (site specific structure list)</p>		<ul style="list-style-type: none"> <li>• <b>VISIBLE DAMAGE</b> to or penetration of <b>ANY</b> <b>Table H-1</b> plant structures</li> <li>• Control Room indication of <b>DEGRADED PERFORMANCE</b> of safe shutdown systems</li> </ul>	<p>Structures Containing Safe Shutdown Systems or Components.”  The NEI phrase "those safety systems" has been changed to "safe shutdown systems" to be consistent with the NEI bases intent. It is clear from the introductory phrase "...resulting in <b>EITHER</b>..." that the safety systems of concern are those affected by the projectiles.</p>
<p>5</p>	<p>Vehicle crash resulting in <b>VISIBLE DAMAGE</b> to <b>ANY</b> of the following structures containing safety systems or components <b>OR</b> control room indication of degraded performance of those safety systems:  (site specific structure list)</p>	<p>HA1.6</p>	<p>Vehicle Crash or <b>PROJECTILE</b> Impact with or within <b>ANY</b> <b>Table H-1</b> Structure  <b>AND</b>  The Vehicle Crash or <b>PROJECTILE</b> Impact results in <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• Control Room indication of <b>DEGRADED PERFORMANCE</b> of a <b>Safety System</b> within <b>Table H-1</b> Structure</li> <li>• <b>VISIBLE DAMAGE</b> to <b>ANY</b> of the <b>plant</b> structures in <b>Table H-1</b></li> </ul>	<p>The phrase "or <b>PROJECTILE</b> Impact" has been added to the vehicle crash threshold as a "site specific occurrence" allowed by NEI Example EAL #6. Projectiles could be generated from events such as a boat explosion in the river, a compressed gas cylinder ejected during a vehicle crash, objects jettisoned from aircraft, a tornado touching down outside the protected area, etc.  Table H-1 contains the site specific structure list.</p>
<p>6</p>	<p>(Site specific occurrences) resulting in <b>VISIBLE DAMAGE</b> to <b>ANY</b> of the following structures containing safety systems or components <b>OR</b> control room indication of degraded performance of those safety systems:  (site specific structure list)</p>		<p>(This cell is shared with the row above and contains the same content.)</p>	<p>The NEI phrase "those safety systems" has been changed to "<b>Safety System</b>" to be consistent with the NEI bases intent. It is clear from the introductory phrase "...results in <b>EITHER</b>..." that the safety systems of concern are those affected by the vehicle crash or projectile.</p>

**Table H-1 Plant Structures Containing Safe Shutdown Systems or Components**

- Reactor Building
- Control/Auxiliary Building
- Service Water Intake Structure
- Service/Radwaste Building

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HA2	FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown MODE: All	HA2	<b>FIRE or EXPLOSION in a VITAL AREA</b> affecting the operability of plant safety systems required to establish or maintain safe shutdown OPCON: All	The phrase "in a <b>VITAL AREA</b> " has been added to the HCGS IC because safety systems required to establish or maintain safe shutdown are located in vital areas.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	FIRE or EXPLOSION resulting in <b>VISIBLE DAMAGE</b> to <b>ANY</b> of the following structures containing safety systems or components <b>OR</b> control room indication of degraded performance of those safety systems: (site specific structure list)	HA2.1	<b>FIRE in <u>ANY</u> Table H-1</b> plant structure affecting the operability of plant safety systems required to establish or maintain safe shutdown <b>AND</b> <b>≥ 15 minutes</b> have elapsed (Note 3) Note 3: 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 will likely exceed the applicable time.	The NEI EAL wording has been changed to agree with the IC wording which expresses concern for the operability of safety systems instead of visible damage or degraded performance. The duration of a fire has been increased to 15 minutes or more for consistency with EAL HU2.1 in which a fire extinguished within 15 minutes is not detrimental and does not require emergency classification. Vital Areas of concern during a fire or explosion are listed in Table H-1 plant structures. Note 3 has been added for consistency with other EALs that specify a timing duration.
		HA2.2	<b>EXPLOSION in <u>ANY</u> Table H-1</b> plant structure affecting the operability of plant safety systems required to establish or maintain	The example EAL has been broken into two separate EALs addressing fire and explosions consistent with the HU2.1 and HU2.2 thresholds. The NEI EAL wording has been changed to agree with the IC

			safe shutdown	<p>wording which expresses concern for the operability of safety systems instead of visible damage or degraded performance.</p> <p>Vital Areas of concern during a fire or explosion are listed in Table H-1 plant structures.</p>
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**Table H-1 Plant Structures Containing Safe Shutdown Systems or Components**

- Reactor Building
- Control/Auxiliary Building
- Service Water Intake Structure
- Service/Radwaste Building

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HA3	Access to a vital area is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of operable equipment required to maintain safe operations or safely shutdown the reactor  MODE: All	HA3	Access to a <b>VITAL AREA</b> is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of operable equipment required to maintain safe operations or safely shut down the reactor  OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of systems required to maintain safe operations or safely shutdown the reactor.  Note: If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.	HA3.1	Access to <b>ANY Table H-1</b> plant structure is prohibited due to toxic, corrosive, asphyxiant, or flammable gases which jeopardize operation of systems required to maintain safe operations or safely shut down the reactor (Note 5)  Note 5: If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should NOT be declared as it will have NO adverse impact on the ability of the plant to safely operate or safely shut down beyond that already allowed by Technical Specifications	Table H-1 provides the site-specific list of structures containing equipment necessary for safe shutdown.  The NEI phrase “a VITAL AREA” has been replaced with “ <b>ANY Table H-1</b> plant structure” for consistency with other Hazards EALs.

			at the time of the event.	
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HA4	HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat MODE: All	HA4	<b>HOSTILE ACTION</b> within the <b>OWNER CONTROLLED AREA</b> or airborne attack threat OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the (site specific security shift supervision).	HA4.1	A <b>HOSTILE ACTION</b> is occurring or has occurred within the <b>OCA</b> as reported by the Security Operations Supervisor or designee (Note 9)	Example EALs #1 and #2 have been combined into a single EAL for usability.
2	A validated notification from NRC of an airliner attack threat within 30 minutes of the site		<p><b>OR</b></p> <p>A <b>VALIDATED</b> notification from NRC of a <b>AIRLINER</b> attack threat &lt; <b>30 minutes</b> away from Salem/Hope Creek (Note 9)</p> <p>NOTE 9: Shift Manager (SM) should implement the Prompt Actions of NC.EP-EP.ZZ-0102, EC Response, Attachment 10, prior to classification of a security emergency.</p> <p>Key Information to obtain from Security Supervision upon SM notification of a security event:</p> <ul style="list-style-type: none"> <li>• Determination if the security event is a <b>HOSTILE ACTION</b> or <b>SECURITY CONDITION</b></li> <li>• If a <b>HOSTILE ACTION</b>, is location the <b>OCA</b> or <b>PA</b>?</li> </ul>	<p>The "Security Shift Supervision" is the Security Operations Supervisor or designee.</p> <p>The NEI phrase "of the site" has been changed to "away from Salem/Hope Creek" to clarify the intent of the EAL as described in the NEI basis.</p> <p>Added Note 9 to provide guidance to implement immediate security based response actions prior to declaring the security based emergency and to obtain critical information of the nature of the security event.</p>

EAL Comparison Matrix

OSSI HCGS

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HA5	Control room evacuation has been initiated MODE: All	HA5	Control Room evacuation has been initiated OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	(Site-specific procedure) requires control room evacuation.	HA5.1	Control Room evacuation has been initiated	Reference to plant procedures has been eliminated. The intent of the EAL is that an evacuation of the Control Room has begun for any reason. This change is addressed in NEI/NRC FAQ #28.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HA6	Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert MODE: All	HA6	Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of an ALERT OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation 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.	HA6.1	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 <b>Hostile Action</b> . <u>ANY</u> releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels	None

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HS2	Control room evacuation has been initiated and plant control cannot be established MODE: All	HS5	Control Room evacuation has been initiated and plant control CANNOT be established OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	a. Control room evacuation has been initiated.  <b>AND</b>  b. Control of the plant cannot be established within (site specific minutes).	HS5.1	Control Room evacuation has been initiated  <u><b>AND</b></u>  Control of the plant CANNOT be established within <b>15 minutes</b> (Note 3)  Note 3: 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 will likely exceed the applicable time.	15 minutes is the site-specific interval to establish plant control following Control Room evacuation.  Reference to Note 3 has been added to the HCGS EAL for consistency with other NEI EALs with a timing component.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HS3	Other conditions exist which in the judgment of the Emergency Director warrant declaration of a Site Area Emergency MODE: All	HS6	Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of a SITE AREA EMERGENCY OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation 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	HS6.1	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 <b>HOSTILE ACTION</b> 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. <b>ANY</b> 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	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HS4	HOSTILE ACTION within the PROTECTED AREA MODE: All	HS4	<b>HOSTILE ACTION</b> within the <b>PROTECTED AREA</b> OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the (site security shift supervision).	HS4.1	<p>A <b>HOSTILE ACTION</b> is occurring or has occurred within the <b>PROTECTED AREA</b> as reported by the Security Operations Supervisor or designee (Note 9)</p> <p>NOTE 9: Shift Manager (SM) should implement the Prompt Actions of NC.EP-EP.ZZ-0102, EC Response, Attachment 10, prior to classification of a security emergency.</p> <p>Key Information to obtain from Security Supervision upon SM notification of a security event:</p> <ul style="list-style-type: none"> <li>• Determination if the security event is a <b>HOSTILE ACTION</b> or <b>SECURITY CONDITION</b></li> <li>• If a <b>HOSTILE ACTION</b>, is location the <b>OCA</b> or <b>PA</b>?</li> </ul>	<p>The "Security Shift Supervision" is the Security Operations Supervisor or designee.</p> <p>Added Note 9 to provide guidance to implement immediate security based response actions prior to declaring the security based emergency and to obtain critical information of the nature of the security event.</p>

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HG1	HOSTILE ACTION resulting in loss of physical control of the facility  MODE: All	HG4	<b>HOSTILE ACTION</b> resulting in loss of physical control of the facility  OPCON: All	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	A HOSTILE ACTION has occurred such that plant personnel are unable to operate equipment required to maintain safety functions.	HG4.1	A <b>HOSTILE ACTION</b> has occurred such that plant personnel are unable to operate equipment required to maintain safety functions (i.e., reactivity control, RPV water level, or decay heat removal) at Salem or Hope Creek (Note 9)	<p>The parenthetical examples of safety functions have been added the HCGS EAL to clarify the intent of the EAL as discussed in the NEI basis.</p> <p>The NEI phrase "...for a freshly off-loaded reactor core in pool " has been deleted. This phrase is not a defined condition for HCGS nor is there any relevant guidance for defining such a phrase. The threshold as proposed would require a General Emergency declaration for any hostile action resulting in a loss of spent fuel cooling leading to imminent fuel damage, regardless of the amount of time the fuel has been off-loaded. This change is addressed in NEI/NRC FAQ #29.</p> <p>The phrase "at Salem or Hope Creek" has been added to the two conditions of this EAL for clarification.</p> <p>Added Note 9 to provide guidance to implement immediate security based response actions prior to declaring the security based emergency and to obtain critical information of the nature of the security event.</p>
2	A HOSTILE ACTION has caused failure of Spent Fuel Cooling Systems and IMMEDIATE fuel damage is likely for a freshly off-loaded reactor core in pool.		<p><b>OR</b></p> <p>A <b>HOSTILE ACTION</b> has caused failure of Spent Fuel Cooling Systems and <b>IMMEDIATE</b> fuel damage is likely at Salem or Hope Creek (Note 9)</p> <p>NOTE 9: Shift Manager (SM) should implement the Prompt Actions of NC.EP-EP.ZZ-0102, EC Response, Attachment 10, prior to classification of a security emergency.</p> <p>Key Information to obtain from Security Supervision upon SM notification of a security event:</p> <ul style="list-style-type: none"> <li>Determination if the security event is a <b>HOSTILE ACTION</b> or <b>SECURITY CONDITION</b></li> <li>If a <b>HOSTILE ACTION</b>, is location</li> </ul>	

			the <b>OCA</b> or <b>PA</b> ?	
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
HG2	Other conditions exist which in the judgment of the Emergency Director warrant declaration of a General Emergency MODE: All	HG6	Other conditions exist that in the judgment of the Emergency Coordinator warrant declaration of GENERAL EMERGENCY OPCON: All	The NEI term "which" has been replaced with "that" for proper grammar.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation 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 <b>IMMINENT</b> substantial core degradation or melting with potential for loss of containment integrity or <b>HOSTILE ACTION</b> that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area.	HG6.1	Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which involve actual or <b>IMMINENT</b> substantial core degradation or melting with potential for loss of containment integrity or <b>HOSTILE ACTION</b> that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area	None

**Category S**  
**System Malfunction**

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SU1	Loss of all Off-site AC power to emergency busses for 15 minutes or longer.  MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU1	Loss of all offsite AC power to vital buses for 15 minutes or longer  OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	"Vital buses" is equivalent to the NEI phrase "emergency buses."

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Loss of all off-site AC power to (site specific emergency busses) for 15 minutes or longer.  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.	SU1.1	Loss of <b>all</b> Offsite AC power to <b>all</b> 4.16 KV Vital Buses  <u><b>AND</b></u> $\geq 15$ minutes have elapsed (Note 3)  Note 3: 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 will likely exceed the applicable time.	4.16 KV vital buses are the HCGS emergency buses.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SU2	Inability to reach required shutdown within Technical Specification limits MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU4	Inability to reach required shutdown within Technical Specification limits OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Plant is not brought to required operating mode within Technical Specifications LCO Action Statement Time.	SU4.1	Plant is NOT brought to required Operational Condition (OPCON) within Technical Specifications LCO action statement time	None

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SU3	<p>UNPLANNED loss of safety system annunciation or indication in the control room for 15 minutes or longer.</p> <p>MODE: Power Operation, Startup, Hot Standby, Hot Shutdown</p>	SU5	<p>UNPLANNED loss of safety system annunciation or indication in the Control Room for 15 minutes or longer</p> <p>OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown</p>	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>1. UNPLANNED Loss of greater than approximately 75% of the following for 15 minutes or longer:</p> <p>a. (Site specific control room safety system annunciation)</p> <p><b>OR</b></p> <p>b. (Site specific control room safety system indication)</p> <p><b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</p>	SU5.1	<p>UNPLANNED loss of &gt; <b>approximately 75%</b> of Control Room Overhead Annunciators for <b>≥ 15 minutes</b> (Note 3)</p> <p><b>OR</b></p> <p>UNPLANNED loss of &gt; <b>approximately 75%</b> of Control Room Indications associated with the following safety functions for <b>≥ 15 minutes</b> (Note 3):</p> <ul style="list-style-type: none"> <li>• Reactivity Control</li> <li>• RCS Inventory</li> <li>• Decay Heat Removal</li> <li>• Fission Product Barriers</li> </ul> <p>Note 3: The Emergency Coordinator should NOT wait until the applicable time has elapsed, but should declare the event</p>	<p>Parts a and b of the NEI example EAL have been introduced with the phrase “UNPLANNED loss of...” for clarification.</p> <p>“Control Room Overhead Annunciators” are the NEI “Site specific control room safety system annunciation.” Each Overhead Annunciator panel displays multiple annunciators associated with safety systems.</p> <p>Control Room indicators associated with the listed safety functions are the NEI “Site specific control room safety system indication.” HCGS safety systems are designed to fulfill one or more of these safety functions.</p>

			as soon as it is determined that the condition will likely exceed the applicable time.	
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SU4	Fuel Clad degradation MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU7	Fuel clad degradation OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	(Site specific radiation monitor readings indicating fuel clad degradation greater than Technical Specification allowable limits.)	SU7.1	<b>VALID</b> Offgas Pretreatment Radiation Monitor (9RX621/9RX622) <b>high alarm</b>	<p>The NEI phrase "...radiation monitor readings indicating fuel clad degradation greater than Technical Specification allowable limits" has been deleted because it is commonly understood that the Offgas Pretreatment Radiation Monitor high alarm is indicative of fuel clad degradation associated with the Technical Specification limit.</p> <p>The Offgas Pretreatment Radiation Monitors (9RX621 / 9RX622) sense gamma radiation levels attributable to the noncondensable fission product gases produced in the reactor coolant and transported with steam through the turbine to the condenser. These instruments take a sample from the sample tap between the fourth and fifth holdup pipe of the Offgas system.</p> <p>Operating Experience at HCGS has demonstrated that reactor coolant activity changes for reasons other than fuel clad degradation can result in temporarily increasing Offgas Pretreatment Radiation Monitor readings. Such events (e.g., resin intrusion, HWCI system malfunction, etc.) do not require classification under this EAL. For this reason, the EAL begins with the term "valid."</p> <p>The setpoint of the Offgas Pretreatment Radiation Monitor (9RX621 / 9RX622) high alarm is 2.2E+04 mR/hr and ensures that the alarm will actuate prior to exceeding Technical Specification 3.3.7.1 and 3.11.2.7 Offgas System noble gas effluent limit of 3.3E5 <math>\mu</math>Ci/sec.</p>
2	(Site specific coolant sample	SU7.2	Coolant activity > 4 $\mu$ Ci/gm Dose	The specified reactor coolant activity is given in HCGS Technical

	activity value indicating fuel clad degradation greater than Technical Specification allowable limits.)		Equivalent I-131	Specifications 3.4.5.
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NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SU5	RCS leakage MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU8	RCS leakage OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Unidentified or pressure boundary leakage greater than 10 gpm	SU8.1	<p><b>UNIDENTIFIED LEAKAGE</b> or <b>PRESSURE BOUNDARY LEAKAGE &gt; 10 gpm</b> (Using 10 minute average) (Note 6)</p> <p><u>OR</u></p> <p><b>IDENTIFIED LEAKAGE &gt; 25 gpm</b> (Averaged over any 24 hour period) (Note 6)</p> <p>Note 6: See the Fission Product Barrier Table for possible escalation above the UNUSUAL EVENT due to RCS Leakage</p>	<p>SU8.1 implements Example EALs #1 and #2. These were combined for improved usability.</p> <p>The phrase "(Using 10 minute average)" has been added to clarify the method by which UNIDENTIFIED and PRESSURE BOUNDARY LEAKAGE can be determined.</p> <p>IDENTIFIED LEAKAGE should ONLY be classified as an UNUSUAL EVENT, when the leak rate exceeds 25 gpm when averaged over any 24-hour period, regardless of whether or not the leak has been isolated. The 24 hour average is included as part of the EAL threshold to provide consistency with the Technical Specification limit for IDENTIFIED LEAKAGE.</p> <p>The Hope Creek Technical Specification limit for RCS IDENTIFIED LEAKAGE is 25 gpm averaged over any 24 hour period. The plant is within Technical Specification as long as this limit is not exceeded and hence an UNUSUAL EVENT is not warranted until the limit is exceeded.</p> <p>This philosophy is consistent with that contained in NEI 99-01 Rev. 5 Section 3, which only requires declaration of an UNUSUAL EVENT when the plant is outside the Technical Specification.</p> <p>Note 6 has been added to remind the EAL-user to review the Fission Product Barrier Table for possible escalation to higher emergency classifications due to RCS leakage.</p>
2	Identified leakage greater than 25 gpm			

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SU6	Loss of all On-site or Off-site communications capabilities MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SU6	Loss of all onsite or offsite communications capabilities OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Loss of all of the following on-site communication methods affecting the ability to perform routine operations.  (site specific list of communications methods)	SU6.1	Loss of <b>all Table S-2</b> Onsite communication methods affecting the ability to perform routine operations  <u>OR</u> Loss of <b>all Table S-2</b> Offsite communication methods affecting the ability to perform offsite notifications	SU6.1 implements Example EALs #1 and #2. These were combined for improved usability.  The NEI example EALs specify site-specific lists of onsite and offsite communications methods. The HCGS EAL lists these methods in Table S-2 for simplification.
2	Loss of all of the following off-site communication methods affecting the ability to perform offsite notifications.  (site specific list of communications methods)			

Table S-2 Communications Systems		
System	Onsite	Offsite
Direct Inward Dial System (DID)	X	X
Station Page System (Gaitronics)	X	
Station Radio System	X	
Nuclear Emergency Telephone System (NETS)		X
Centrex Phone System (ESSX)		X
NRC (ENS)		X

EAL Comparison Matrix

OSSI HCGS

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SU8	Inadvertent criticality MODE: Hot Standby, Hot Shutdown	SU3	Inadvertent criticality OPCON: 3 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	UNPLANNED sustained positive period observed on nuclear instrumentation. [BWR]	SU3.1	<b>UNPLANNED</b> sustained positive period observed on nuclear instrumentation	None
1	UNPLANNED sustained positive startup rate observed on nuclear instrumentation. [PWR]	N/A	N/A	NEI PWR Example EAL #1 has not been implemented because it applies only to PWR plants. HCGS is a BWR.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SA2	Automatic Scram (Trip) fails to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor  MODE: Power Operation, Startup	SA3	Automatic scram fails to shut down the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor  OPCON: 1 - Power Operations, 2 - Startup	The NEI term "Trip" has been deleted to use terminology common to a BWR.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	a. An automatic scram (trip) failed to shutdown the reactor.  <b>AND</b>  b. Manual actions taken at the reactor control console successfully shutdown the reactor as indicated by (site specific indications of plant shutdown).	SA3.1	An automatic scram failed to shut down the reactor  <u><b>AND</b></u>  Manual scram actions taken at the reactor control console (mode switch, manual scram pushbuttons, manual ARI actuation) successfully shut down the reactor as indicated by reactor power $\leq 4\%$	The NEI term "Trip" has been deleted to use terminology common to a BWR.  Following a successful reactor scram, a prompt drop in reactor power to subcriticality should occur. This is defined to be at or below the APRM downscale trip setpoint (4%).  The NEI phrase "Manual actions" has been changed to "Manual scram actions" and the phrase "mode switch, manual scram pushbuttons or manual ARI actuation " has been added for clarification.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SA4	<p>UNPLANNED Loss of safety system annunciation or indication in the control room with EITHER (1) a SIGNIFICANT TRANSIENT in progress, or (2) compensatory indicators unavailable.</p> <p>MODE: Power Operation, Startup, Hot Standby, Hot Shutdown</p>	SA5	<p><b>UNPLANNED</b> loss of safety system annunciation or indication in the Control Room with either (1) a <b>SIGNIFICANT TRANSIENT</b> in progress, or (2) compensatory indicators unavailable</p> <p>OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown</p>	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>a. UNPLANNED Loss of greater than approximately 75% of the following for 15 minutes or longer:</p> <ul style="list-style-type: none"> <li>• (Site specific control room safety system annunciation)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• (Site specific control room safety system indication)</li> </ul> <p>b. <b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• A SIGNIFICANT TRANSIENT in progress</li> <li>• Compensatory indications are unavailable</li> </ul> <p><b>Note:</b> The Emergency Director should not wait until the applicable time has</p>	SA5.1	<p><b>UNPLANNED</b> loss of &gt; <b>approximately 75%</b> of Control Room Overhead Annunciators for <b>≥ 15 minutes</b> (Note 3)</p> <p><b>OR</b></p> <p><b>UNPLANNED</b> loss of &gt; <b>approximately 75%</b> of Control Room Indications associated with the following safety functions for <b>≥ 15 minutes</b> (Note 3):</p> <ul style="list-style-type: none"> <li>• Reactivity Control</li> <li>• RCS Inventory</li> <li>• Decay Heat Removal</li> <li>• Fission Product Barriers</li> </ul> <p><b>AND</b></p> <p><b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• A <b>SIGNIFICANT</b></li> </ul>	<p>Parts a and b of the NEI example EAL have been introduced with the phrase “UNPLANNED loss of...” for clarification.</p> <p>“Control Room Overhead Annunciators” are the NEI “Site specific control room safety system annunciation.” Each Overhead Annunciator panel displays multiple annunciators associated with safety systems.</p> <p>Control Room indicators associated with the listed safety functions are the NEI “Site specific control room safety system indication.” HCGS safety systems are designed to fulfill one or more of these safety functions.</p> <p>Table S-1 provides the list of events that constitute a “significant transient” as specified in the NEI Section 5.4 definition of significant transient. The NEI Section 5.4 definition of significant transient has been changed to reflect BWR-specific requirements:</p> <ul style="list-style-type: none"> <li>• Many BWRs have bypass capability &gt; 25% such that they can handle a 25% full electrical load rejection (i.e., results in no thermal power transient). Others can only handle as low as a 10% full electrical load rejection. HCGS is equipped with 22.18% turbine bypass capacity (rounded to 22%). There are</li> </ul>

	<p>elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</p>		<p><b>TRANSIENT</b> is in progress, <b>Table S-1</b></p> <ul style="list-style-type: none"> <li>• Compensatory indications are NOT available (PPC, CRIDS and SPDS)</li> </ul> <p>Note 3: 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 will likely exceed the applicable time.</p>	<p>other events that can cause a 25% power reduction such as recirculation system runbacks. Any 25% thermal power reduction, regardless of cause, would meet the intent of the significant transient condition.</p> <ul style="list-style-type: none"> <li>• The BWR equivalent to a Safety Injection Activation is ECCS injection.</li> </ul> <p>This change is being addressed in NEI/NRC FAQ #39. The NEI term “unavailable” has been changed to “NOT available” for clarification. PPC, CRIDS and SPDS are the plant specific compensatory indications and have been added in parenthesis for clarification.</p>
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**Table S-1 SIGNIFICANT TRANSIENTS**

- Reactor scram
- Thermal Power Reduction > 25%
- Electrical Load rejection > 22%
- ECCS injection
- Thermal power oscillations > 10%



NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SA5	<p>AC power capability to emergency busses reduced to a single power source for 15 minutes or longer such that any additional single failure would result in station blackout.</p> <p>MODE: Power Operation, Startup, Hot Standby, Hot Shutdown</p>	SA1	<p>AC power capability to vital buses reduced to a single power source for 15 minutes or longer such that any additional single failure would result in complete loss of AC power to vital buses</p> <p>OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown</p>	<p>“Vital buses” is equivalent to the NEI phrase “emergency buses.”</p> <p>The term “station blackout” was replaced with “complete loss of AC power to vital buses” as this describes the intended condition leading to the Alert threshold in CA1.1. Station Blackout is not an operationally defined term for loss of all AC to vital buses.</p>

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>a. AC power capability to (site-specific emergency busses) reduced to a single power source for 15 minutes or longer.</p> <p><b>AND</b></p> <p>b. Any additional single power source failure will result in station blackout.</p> <p><b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</p>	SA1.1	<p>Loss of 4.16 KV Vital Bus Power Sources (Offsite and Onsite) which results in the availability of only <b>one</b> 4.16 KV Vital Bus Power Source (Offsite or Onsite)</p> <p><b>AND</b></p> <p><b>≥ 15 minutes</b> have elapsed (Note 3)</p> <p>Note 3: 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 will likely exceed the applicable time.</p>	<p>4.16 KV vital buses are the HCGS emergency buses.</p> <p>The NEI phrase “AC power capability to (site specific emergency busses) reduced to a single power source” has been changed to “Loss of 4.16 KV Vital Bus Power Sources (Offsite and Onsite) which results in the availability of only one 4.16 KV Vital Bus Power Source (Offsite or Onsite)” because to reflect the specific HCGS vital power configuration..</p> <p>The AND logic used in NEI 99-01 is improper as the second condition is not a separate condition of equal weight but rather a qualifier of the first. The threshold statement has been reworded to properly reflect the intent.</p> <p>Station Blackout is not an operationally defined term for loss of all AC to vital buses.</p>



NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SS1	Loss of all Off-site and all On-Site AC power to emergency busses for 15 minutes or longer.  MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SS1	Loss of all offsite power and all onsite AC power to vital buses for 15 minutes or longer  OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	"Vital buses" is equivalent to the NEI phrase "emergency buses."

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Loss of all Off-Site and all On-Site AC power to (site specific emergency busses) for 15 minutes or longer.  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.	SS1.1	Loss of <b>all</b> Power (Onsite and Offsite) to <b>all</b> 4.16 KV Vital Buses  <u><b>AND</b></u> ≥ <b>15 minutes</b> have elapsed (Note 3)  Note 3: 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 will likely exceed the applicable time.	The NEI phrase "Loss of all off-site and all on-site AC power" has been changed to "Loss of all Power (Onsite and Offsite)" for simplification.  4.16 KV vital buses are the HCGS emergency buses.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SS2	Automatic Scram (Trip) fails to shutdown the reactor and manual actions taken from the reactor control console are not successful in shutting down the reactor  MODE: Power Operation, Startup	SS3	Automatic scram fails to shut down the reactor and manual actions taken from the reactor control console are not successful in shutting down the reactor  OPCON: 1 - Power Operations, 2 - Startup	The NEI term "Trip" has been deleted to use terminology common to a BWR.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	a. An automatic scram (trip) failed to shutdown the reactor.  <b>AND</b>  b. Manual actions taken at the reactor control console do not shutdown the reactor as indicated by (site specific indications of reactor not shutdown).	SS3.1	An automatic scram failed to shut down the reactor  <u><b>AND</b></u>  Manual scram actions taken at the reactor control console (mode switch, manual scram pushbuttons, manual ARI do NOT shut down the reactor as indicated by reactor power > 4%	The NEI term "Trip" has been deleted to use terminology common to a BWR.  The site specific indication of reactor not shutdown is the APRM downscale trip setpoint (4%).  The NEI phrase "Manual actions" has been changed to "Manual scram actions" and the phrase "mode switch, manual scram pushbuttons or manual ARI actuation " has been added for clarification.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SS3	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  OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	Less than (site specific bus voltage indication) on all (site specific Vital DC busses) for 15 minutes or longer.  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.	SS2.1	<p><b>&lt; 108 V DC</b> bus voltage indication on <b>all</b> Vital 125 V DC Buses</p> <p><b><u>AND</u></b></p> <p><b>≥ 15 minutes</b> have elapsed (Note 3)</p> <p>Note 3: 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 will likely exceed the applicable time.</p>	108 VDC is the site-specific bus voltage.  125 VDC Power Channels A, B, C and D are the site-specific vital DC buses.

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SS6	Inability to Monitor a <b>SIGNIFICANT TRANSIENT</b> in Progress  MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SS5	Inability to monitor a <b>SIGNIFICANT TRANSIENT</b> in progress  OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	None

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	a. Loss of greater than approximately 75% of the following for 15 minutes or longer: <ul style="list-style-type: none"> <li>• (Site specific control room safety system annunciation)</li> </ul> <b>OR</b> <ul style="list-style-type: none"> <li>• Site specific control room safety system indication)</li> </ul> <b>AND</b> b. A <b>SIGNIFICANT TRANSIENT</b> in progress  <b>AND</b> c. Compensatory indications are unavailable  <b>Note:</b> The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the	SS5.1	Loss of > <b>approximately 75%</b> of Control Room Overhead Annunciators for <b>≥ 15 minutes</b> (Note 3)  <u><b>OR</b></u> Loss of > <b>approximately 75%</b> of Control Room Indications associated with the following safety functions for <b>≥ 15 minutes</b> (Note 3): <ul style="list-style-type: none"> <li>• Reactivity Control</li> <li>• RCS Inventory</li> <li>• Decay Heat Removal</li> <li>• Fission Product Barriers</li> </ul> <b>AND</b> A <b>SIGNIFICANT TRANSIENT</b> is in progress, <b>Table S-1</b>  <u><b>AND</b></u> Compensatory indications are NOT available (PPC, CRIDS)	Parts a and b of the NEI example EAL have been introduced with the phrase “UNPLANNED loss of...” for clarification.  “Control Room Overhead Annunciators” are the NEI “Site specific control room safety system annunciation.” Each Overhead Annunciator panel displays multiple annunciators associated with safety systems.  Control Room indicators associated with the listed safety functions are the NEI “Site specific control room safety system indication.” HCGS safety systems are designed to fulfill one or more of these safety functions.  Table S-1 provides the list of events that constitute a “significant transient” as specified in the NEI Section 5.4 definition of significant transient. The NEI Section 5.4 definition of significant transient has been changed to reflect BWR-specific requirements: <ul style="list-style-type: none"> <li>• Many BWRs have bypass capability &gt; 25% such that they can handle a 25% full electrical load rejection (i.e., results in no thermal power transient). Others can only handle as low as a 10% full electrical load rejection. HCGS is equipped with 22.18% turbine bypass capacity (rounded to 22%). There are other events that can cause a 25% power reduction such as recirculation system runbacks. Any 25% thermal power reduction, regardless of cause, would meet the intent of the</li> </ul>

	<p>condition has exceeded, or will likely exceed, the applicable time.</p>	<p>and SPDS)                  Note 3: 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 will likely exceed the applicable time.</p>	<p>significant transient condition.</p> <ul style="list-style-type: none"> <li>• The BWR equivalent to a Safety Injection Activation is ECCS injection.</li> </ul> <p>This change is being addressed in NEI/NRC FAQ #39.                  The NEI term "unavailable" has been changed to "NOT available" for clarification.                  PPC, CRIDS and SPDS are the plant specific compensatory indications and have been added in parenthesis for clarification.</p>
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<p><b>Table S-1 SIGNIFICANT TRANSIENTS</b></p>
<ul style="list-style-type: none"> <li>• Reactor scram</li> <li>• Thermal Power Reduction &gt; 25%</li> <li>• Electrical Load rejection &gt; 22%</li> <li>• ECCS injection</li> <li>• Thermal power oscillations &gt; 10%</li> </ul>

NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SG1	Prolonged loss of all Off-site and all On-Site AC power to emergency busses.  MODE: Power Operation, Startup, Hot Standby, Hot Shutdown	SG1	Prolonged loss of all offsite and all onsite AC power to vital buses  OPCON: 1 - Power Operations, 2 - Startup, 3 - Hot Shutdown	"Vital buses" is equivalent to the NEI phrase "emergency buses."

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	a. Loss of all off-site and all on-site AC power to (site specific emergency busses).  <b>AND</b> b. <b>EITHER</b> of the following: <ul style="list-style-type: none"> <li>• Restoration of at least one emergency bus in less than (site specific hours) is not likely.</li> <li>• (Site specific Indication of continuing degradation of core cooling based on Fission Product Barrier monitoring.)</li> </ul>	SG1.1	Loss of <b>all</b> Power (Onsite and Offsite) to <b>all</b> 4.16 KV Vital Buses  <b>AND</b> <b>ANY</b> of the following: <ul style="list-style-type: none"> <li>• Restoration of at least <b>one</b> Vital Bus in <b>&lt; 4 hrs</b> is NOT likely</li> <li>• RPV level <b>CANNOT</b> be restored and maintained above <b>-161 in.</b></li> <li>• RPV level <b>CANNOT</b> be determined</li> </ul>	The NEI phrase "Loss of all off-site and all on-site AC power" has been changed to "Loss of <b>all</b> Power (Onsite and Offsite)" for simplification.  4.16 KV vital buses are the HCGS emergency buses.  The NEI phrase "AND...EITHER" has been changed to " <b>AND...ANY</b> " because more than two HCGS conditions are needed to implement the two bulleted NEI conditions.  4 are the "(site-specific)" hours for station blackout coping. The four-hour interval to restore AC power is based on the blackout coping analysis performed in conformance with 10 CFR 50.63 and Regulatory Guide 1.155.  The NEI phrase "... (Site-Specific Indication of continuing degradation of core cooling based on Fission Product Barrier monitoring)" has been replaced with "RPV level <b>CANNOT</b> be restored and maintained above <b>-161 in...</b> RPV level <b>CANNOT</b> be determined" for clarification. This threshold represents the NEI conditions consistent with the corresponding Fuel Clad barrier Potential Loss and RCS barrier Loss thresholds for RPV water level.



NEI IC#	NEI IC Wording	HCGS IC#(s)	HCGS IC Wording	Difference/Deviation Justification
SG2	Automatic Scram (Trip) and all manual actions fail to shutdown the reactor and indication of an extreme challenge to the ability to cool the core exists  MODE: Power Operation, Startup	SG3	Automatic scram and all manual actions fail to shut down the reactor and indication of an extreme challenge to the ability to cool the core exists  OPCON: 1 - Power Operations, 2 - Startup	The NEI term "Trip" has been deleted to use terminology common to a BWR.

NEI Ex. EAL #	NEI Example EAL Wording	HCGS EAL #	HCGS EAL Wording	Difference/Deviation Justification
1	<p>a. An automatic scram (trip) failed to shutdown the reactor.</p> <p><b>AND</b></p> <p>b. All manual actions do not shutdown the reactor as indicated by (site specific indications of reactor not shutdown).</p> <p><b>AND</b></p> <p>c. <b>EITHER</b> of the following exist or have occurred due to continued power generation:</p> <ul style="list-style-type: none"> <li>• (Site specific indication that core cooling is extremely challenged.)</li> <li>• (Site specific indication that heat removal is extremely challenged.)</li> </ul>	SG3.1	<p>An automatic scram failed to shut down the reactor</p> <p><b>AND</b></p> <p>All manual actions do <u>NOT</u> shut down the reactor as indicated by reactor power &gt; 4%</p> <p><b>AND</b></p> <p><b>EITHER</b> of the following:</p> <ul style="list-style-type: none"> <li>• RPV level CANNOT be restored and maintained above -185 in.</li> <li>• HCTL (EOP Curve SPT-P) is exceeded</li> </ul>	<p>"The NEI term "Trip" has been deleted to use terminology common to a BWR.</p> <p>The site specific indication of reactor not shutdown is the APRM downscale trip setpoint (4%).</p> <p>The NEI phrase "exist or have occurred" has been deleted. The extreme challenge to core cooling only exists if RPV level cannot be restored and maintained above the threshold level. The extreme challenge to heat removal only exists while the threshold limit is exceeded.</p> <p>The NEI phrase "due to continued power generation" has been deleted because the reason core cooling or heat removal is extremely challenged in an ATWS event is immaterial. This change is being addressed in NEI/NRC FAQ #31.</p> <p>The site specific indication that core cooling is extremely challenged is the Minimum Steam Cooling RPV Water Level (MSCRWL). The MSCRWL is the lowest RPV level at which the covered portion of the reactor core will generate sufficient steam to prevent any clad temperature in the uncovered part of the core from exceeding 1500°F. This water level is utilized in the EOPs to preclude fuel damage when RPV level is below the top of active fuel. RPV level below the MSCRWL for an extended period of time without</p>

				<p>satisfactory core spray cooling could be a precursor of a core melt sequence.</p> <p>The site specific indication that heat removal is extremely challenged is the Heat Capacity Temperature Limit (HCTL). The HCTL is the highest suppression pool water temperature from which Emergency RPV Depressurization will not raise suppression chamber pressure above the Primary Containment Pressure Limit (PCPL), while the rate of energy transfer from the RPV to the containment is greater than the capacity of the containment vent. The HCTL is a function of RPV pressure and suppression pool water level. It is utilized to preclude failure of the containment and equipment in the containment necessary for the safe shutdown of the plant. Plant parameters in excess of the HCTL could be a precursor of primary containment failure. Reference to the EOP curve that illustrates the HCTL has been added for clarification.</p>
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