Attachment 1

10 CFR 50.54(q)(5) Procedure Change Summary Analysis

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10 CFR 50.54(q)(5) Procedure Change Summary Analysis

Procedure/Title

Exelon Generation Company, LLC (Exelon) is submitting the following Emergency Plan Addendum revision for Peach Bottom Atomic Power Station (PBAPS):

- EP-AA-1007, Addendum 3, Revision 6, *"Emergency Action Levels for Peach Bottom Atomic Power Station"*

Description of Procedure

EP-AA-1007, Addendum 3 describes the Emergency Action Levels (EALs) implemented at PBAPS for entering Emergency Classification Levels (ECLs).

Description of Changes

The following administrative/editorial corrections were made in Revision 6 to EP-AA-1007, Addendum 3:

- Corrected an editorial discrepancy in the Cold Reference Matrix for EAL CG6. The previous Threshold 3 should be Threshold 2.c and was renumbered accordingly.

- Corrected an editorial discrepancy in the Hot and Cold Reference Matrices for EAL RA1. An "OR" logic statement was needed and was added between Thresholds 3 and 4.

Description of How the Changes Still Comply with Regulations

Correcting the editorial discrepancies noted does not alter the meaning or intent of the approved EALs and applicable regulations and commitments continue to be met. The changes remain consistent with the EALs and Bases as approved by the U.S. Nuclear Regulatory Commission (NRC) as documented in a letter and supporting Safety Evaluation Report (SER) dated July 28, 2015. The changes continue to satisfy applicable Emergency Planning requirements established in 10 CFR 50.47, 10 CFR 50, Appendix E, and the program element guidance of NUREG-0654.

Description of Why the Changes are Not a Reduction in Effectiveness (RIE)

No existing Emergency Planning requirements have been deleted or minimized, and applicable regulations and commitments continue to be met. Emergency response capabilities are maintained and not adversely impacted by the changes. Therefore, the editorial changes described above do not constitute a reduction in effectiveness of the PBAPS Emergency Plan.

Attachment 2

EP-AA-1007, Addendum 3, Revision 6, *"Emergency Action Levels for Peach Bottom Atomic Power Station"*

Emergency Plan Addendum Revision

Exelon Generation®

EXELON NUCLEAR

EMERGENCY ACTION LEVELS FOR

PEACH BOTTOM ATOMIC POWER STATION

REVISION HISTORY

REVISION	REVISION DATE
0	December 2014
1	October 2015
2	December 2016
3	January 2016
4	August 2016
5	September 2017
6	May 2018

Section 1: Classification of Emergencies

1.1 General

Section D of the Exelon Nuclear Standardized Emergency Plan divides the types of emergencies into four EMERGENCY CLASSIFICATION LEVELS (ECLs). The first four are the UNUSUAL EVENT (UE), ALERT, SITE AREA EMERGENCY (SAE), and GENERAL EMERGENCY (GE). These ECLs are entered by satisfying the Initiating Condition (IC) through meeting an Emergency Action Level (EAL) of the IC provided in this section of the Annex. The ECLs are escalated from least severe to most severe according to relative threat to the health and safety of the public and emergency workers. Depending on the severity of an event, prior to returning to a standard day-to-day organization, a state or phase called RECOVERY may be entered to provide dedicated resources and organization in support of restoration and communication activities following the termination of the emergency.

UNUSUAL EVENT (UE): Events are in progress or have occured which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

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

SITE AREA EMERGENCY (SAE): Events are in progress or have occurred which involve an 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.

GENERAL EMERGENCY (GE): Events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

RECOVERY: Recovery can be considered as a phase of the emergency and is entered by meeting emergency termination criteria provided in EP-AA-111 Emergency Classification and Protective Action Recommendations.

EMERGENCY CLASSIFICATION LEVEL (ECL): One of a set of names or titles established by the US Nuclear Regulatory Commission (NRC) for grouping off-normal events or conditions according to (1) potential or actual effects or consequences, and (2) resulting onsite and offsite response actions. The emergency classification levels, in ascending order of severity, are:

- UNUSUAL EVENT (UE)
- ALERT
- SITE AREA EMERGENCY (SAE)
- GENERAL EMERGENCY (GE)

INITIATING CONDITION (IC): An event or condition that aligns with the definition of one of the four EMERGENCY CLASSIFICATION LEVELS by virtue of the potential or actual effects or consequences.

EMERGENCY ACTION LEVEL (EAL): A pre-determined, site-specific, observable threshold for an INITIATING CONDITION that, when met or exceeded, places the plant in a given EMERGENCY CLASSIFICATION LEVEL.

An emergency is classified by assessing plant conditions and comparing abnormal conditions to ICs and EALs, based on the designated Operational Condition (MODE). Modes 1 through 5 are defined in the Technical Specifications (T.S.), for Units 2 and 3, based on Reactor Mode Switch Position and specific plant conditions. "Defueled" Mode was established for classification purposes to reflect conditions where all fuel has been removed from the Reactor Pressure Vessel.

MODE	TITLE
1	Power Operation
2	Start-up
3	Hot Shutdown
4	Cold Shutdown
5	Refueling
D	Defueled

Hot Matrix - applies in modes (1), (2), and (3)

Cold Matrix - applies in modes (4), (5), and (D)

Individuals responsible for the classification of events will refer to the Initiating Condition and EALs on the matrix of the appropriate station Standardized Emergency Plan Annex (this document). This matrix will contain ICs, EALs, Mode Applicability Designators, appropriate EAL numbering system, and additional guidance necessary to classify events. It may be provided as a user aid.

The matrix is set up in six Recognition Categories. The first is designated as "R" and relates to Abnormal Radiological Conditions / Abnormal Radiological Effluent Releases. The second is designated as "F" and relates to Fission Product Barrier Degradation. The third is designated as "M" and relates to hot condition System Malfunctions. The fourth is designated as "C" and relates to Cold Shutdown / Refueling System Malfunctions. The fifth is designated as "H" and relates to Hazards and Other Conditions. The sixth is designated "E-H" and relates to ISFSI Malfunctions.

The matrix is designed to provide an evaluation of the Initiating Conditions from the worst conditions (General Emergencies) on the left to the relatively less severe conditions on the right (Unusual Events). Evaluating conditions from left to right will reduce the possibility that an event will be under classified. All Recognition Categories should be reviewed for applicability prior to classification.

The Initiating Conditions are coded with a two letter and one number code. The first letter is the Recognition Category designator, the second letter is the Classification Level, "U" for (NOTIFICATION OF) UNUSUAL EVENT, "A" for ALERT, "S" for SITE AREA EMERGENCY and "G" for GENERAL EMERGENCY. The EAL number is a sequential number for that Recognition Category series. All ICs that are describing the severity of a common condition (series) will have the same number.

The EAL number may then be used to reference a corresponding page(s), which provides the basis information pertaining to the IC:

- EAL
- Mode Applicability
- Basis

Classification is not to be made without referencing, comparing and satisfying the specified Emergency Action Levels.

A list of definitions is provided as part of this document for terms having specific meaning to the EALs. Site specific definitions are provided for terms with the intent to be used for a particular IC/EAL and may not be applicable to other uses of that term at other sites, the Emergency Plan or procedures.

References are also included to documents that were used to develop the EALs. .

References to the Emergency Director means the person in Command and Control as defined in the Emergency Plan. Classification of emergencies is a non-delegable responsibility of Command and Control for the onsite facilities with responsibility assigned to the Shift Emergency Director (Control Room Shift Manager) or the Station Emergency Director (Technical Support Center). Classification of emergencies remains the responsibility of the applicable onsite facility even after Command and Control is transferred to the Corporate Emergency Director (Emergency Operations Facility).

Although the majority of the EALs provide very specific thresholds, the Emergency Director must remain alert to events or conditions that lead to the conclusion that exceeding the EAL is IMMINENT. If, in the judgment of the Emergency Director, an IMMINENT situation is at hand, the classification should be made as if the EAL has been exceeded. While this is particularly prudent at the higher ECL (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all ECLs.

1.2 Classification, Instrumentation and Transient Events

Classifications are based on evaluation of each Unit. All classifications are to be based upon valid indications, reports or conditions. Indications, reports or conditions are considered valid when they are verified by (1) an instrument channel check, or (2) indications on related or redundant indications, or (3) by direct observation by plant personnel, such that doubt related to the indication's operability, the condition's existence, or the report's accuracy is removed. Implicit in this is the need for timely assessment.

Indications used for monitoring and evaluation of plant conditions include the normally used instrumentation, backup or redundant instrumentation, and the use of other parameters that provide information that supports determination if an EAL threshold has been reached. When an EAL refers to a specific instrument or indication that is determined to be inaccurate or unavailable, then alternate indications shall be used to monitor the specified condition.

During an event that results in changing parameters trending towards an EAL classification, and instrumentation that was available to monitor this parameter becomes unavailable or the parameter goes off scale, the parameter should be assumed to have been exceeded consistent with the trend and the classification made if there are no other direct or indirect means available to determine if the EAL has not been exceeded.

The assessment of some EALs is based on the results of analyses that are necessary to ascertain whether a specific EAL has been exceeded (e.g., dose assessments, chemistry sampling, RCS leak rate calculation, etc.); the EAL and/or the associated basis discussion will identify the necessary analysis. In these cases, the 15-minute declaration period starts with the availability of the analysis results that show the EAL to be exceeded (i.e., this is the time that the EAL information is first available).

Planned evolutions involve preplanning to address the limitations imposed by the condition, the performance of required surveillance testing, and the implementation of specific controls prior to knowingly entering the condition in accordance with the specific requirements of the site's Technical Specifications. Activities which cause the site to operate beyond that allowed by the site's Technical Specifications, planned or unplanned, may result in an EAL being met or exceeded. Planned evolutions to test, manipulate, repair, perform maintenance or modifications to systems and equipment that result in an EAL being met or exceeded are not subject to classification and activation requirements as long as the evolution

proceeds as planned and is within the operational limitations imposed by the specific operating license. However, these conditions may be subject to the reporting requirements of 10 CFR 50.72.

When two or more EALs are determined, declaration will be made on the highest classification level for the Unit. When both units are affected, the highest classification for the Station will be used for notification purposes and both Units' ECLs will be noted.

Concerning ECL Downgrading, Exelon Nuclear policy is that ECLs shall not be downgraded to a lower classification. Once declared, the event shall remain in effect until no Classification is warranted or until such time as conditions warrant classification to Recovery.

There may be cases in which a plant condition that exceeded an EAL was not recognized at the time of occurrence but is identified well after the condition has occurred (e.g., as a result of routine log or record review), and the condition no longer exists. In these cases, an emergency should not be declared. Reporting requirements of 10 CFR 50.72 are applicable, the guidance of NUREG-1022, Event Reporting Guidelines 10 CFR 50.72 and 50.73 and the Reportability Reference Manual, should be applied.

1.3 Mode Applicability

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

For events that occur in Cold Shutdown or Refueling, escalation is via EALs that have Cold Shutdown or Refueling for mode applicability, even if Hot Shutdown (or a higher mode) is entered during any subsequent heat-up. In particular, the Fission Product Barrier Matrix EALs are applicable only to events that initiate in Hot Shutdown or higher.

If there is a change in Mode following an event declaration, any subsequent events involving EALs outside of the current declaration escalation path will be evaluated on the Mode of the plant at the time the subsequent events occur.

1.4 Emergency Director Judgment

Emergency Director (ED) Judgment EALs are provided in the Hazards and Other Condition Affecting Plant Safety section and on the Fission Product Barrier (FPB) Matrix. Both of the ED Judgment EALs have specific criteria for when they should be applied.

The Hazards Section ED Judgment EALs are intended to address unanticipated conditions which are not addressed explicitly by other EALs but warrant declaration of an emergency because conditions exist which are believed by the ED to fall under specific emergency classifications (UE, Alert, SAE or GE).

The FPB Matrix ED Judgment EALs are intended to include unanticipated conditions, which are not addressed explicitly by any of the other FPB threshold values, but warrant determination because conditions exist that fall under the broader definition for a significant Loss or Potential Loss of the barrier (equal to or greater than the defined FPB threshold values).

1.5 Fission Product Barrier (FPB) Threshold

A fission product barrier threshold is a pre-determined, site-specific, observable threshold indicating the loss or potential loss of a fission product barrier.

FPB thresholds represent threats to the defense in depth design concept that precludes the release of radioactive fission products to the environment. This concept relies on multiple physical barriers, any one of which, if maintained intact, precludes the release of significant amounts of radioactive fission products to the environment. The primary FPBs are:

- Fuel Clad (FC)
- Reactor Coolant System (RCS)
- Containment (CT)

Upon determination that one or more FPB thresholds have been exceeded, the combination of barrier loss and/or potential loss thresholds is compared to the FPB IC/EAL criteria to determine the appropriate ECL.

In some accident sequences, the ICs and EALs presented in the Abnormal Radiation Levels/ Radiological Effluent (R) Recognition Category will be exceeded at the same time, or shortly after, the loss of one or more fission product barriers. This redundancy is intentional as the former ICs address radioactivity releases that result in certain offsite doses from whatever cause, including events that might not be fully encompassed by fission product barriers (e.g., spent fuel pool accidents, design containment leakage following a LOCA, etc.).

1.6 Fission Product Barrier Restoration

Fission Product Barriers are not treated the same as EAL threshold values. Conditions warranting declaration of the loss or potential loss of a FPB may occur resulting in a specific classification. The condition that caused the loss or potential loss declaration could be rectified as the result of Operator action, automatic actions, or designed plant response. Barriers will be considered re-established when there are direct verifiable indications (containment penetration or open valve has been isolated, coolant sample results, etc) that the barrier has been restored and is capable of mitigating future events.

The reestablishment of a FPB does not alter or lower the existing classification. Termination and entry into RECOVERY phase is still required for exiting the present classification. However the reestablishment of the barrier should be

considered in determining future classifications should plant conditions or events change.

1.7 Definitions

CONFINEMENT BOUNDARY: The irradiated fuel dry storage cask barrier(s) between areas containing radioactive substances and the environment.

CONTAINMENT CLOSURE: The procedurally defined conditions or actions taken to secure containment (primary or secondary) and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions.

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

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

FISSION PRODUCT BARRIER (FPB) THRESHOLD: A pre-determined, site-specific, observable threshold indicating the loss or potential loss of a fission product barrier.

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

HOSTILE ACTION: An act toward a Nuclear Power Plant (NPP) or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILEs, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on 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).

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

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

INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI): A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.

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

OWNER CONTROLLED AREA (OCA): The property associated with the station and owned by the company. Access is normally limited to persons entering for official business.

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

PROTECTED AREA: An area that normally encompasses all controlled areas within the security protected area fence.

REFUELING PATHWAY: all the cavities, tubes, canals and pools through which irradiated fuel may be moved or stored, but not including the reactor vessel below the flange.

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

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.

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

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

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

Emergency Action Level Technical Basis Page Index

General		Site Area		Alert		Unusual Event	
EAL	Pg.	EAL	Pg.	EAL	Pg.	EAL	Pg.
RG1	2-25	RS1	2-27	RA1	2-29	RU1	2-32
RG2	2-35	RS2	2-36	RA2	2-37	RU2	2-40
				RA3	2-42	RU3	2-45
FG1	2-46	FS1	2-47	FA1	2-48		

Fuel Clad		RCS		Containment	
FC1	2-49				
FC2	2-50	RC2	2-54	CT2	2-61
		RC3	2-56	CT3	2-62
		RC4	2-57		
FC5	2-52	RC5	2-59	CT5	2-64
				CT6	2-65
FC7	2-53	RC7	2-60	CT7	2-68

MG1	2-69	MS1	2-71	MA1	2-73	MU1	2-75
MG2	2-76	MS2	2-78				
		MS3	2-79	MA3	2-81	MU3	2-83
				MA4	2-86	MU4	2-88
				MA5	2-90		
						MU6	2-92
						MU7	2-94
				CA1	2-96	CU1	2-98
				CA2	2-100		
						CU3	2-103
						CU4	2-105
				CA5	2-107	CU5	2-109
CG6	2-111	CS6	2-115	CA6	2-118	CU6	2-120
HG1	2-123	HS1	2-125	HA1	2-127	HU1	2-130
		HS2	2-132	HA2	2-134		
						HU3	2-135
						HU4	2-139
				HA5	2-141		
						HU6	2-144
HG7	2-147	HS7	2-148	HA7	2-149	HU7	2-150
						E-HU1	2-151

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

Abnormal Rad Levels / Radiological Effluents

Radiological Effluents

GENERAL EMERGENCY

RG1 Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mRem TEDE or 5,000 mRem thyroid CDE. 1 2 3 4 5 D

Emergency Action Level (EAL):

Notes:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until dose assessment results are available.

1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 15 minutes**.
   OR
2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:
   a. **> 1000 mRem TEDE**
   OR
   b. **> 5000 mRem CDE Thyroid**
   OR
3. Field survey results at or beyond the site boundary indicate **EITHER**:
   a. Gamma (closed window) dose rates **>1000 mR/hr** are expected to continue for **≥ 60 minutes**.
   OR
   b. Analyses of field survey samples indicate **> 5000 mRem CDE Thyroid** for **60 minutes** of inhalation.

SITE AREA EMERGENCY

RS1 Release of gaseous radioactivity resulting in offsite dose greater than 100 mRem TEDE or 500 mRem thyroid CDE. 1 2 3 4 5 D

Emergency Action Level (EAL):

Notes:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until dose assessment results are available.

1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1value** for **≥ 15 minutes**.
   OR
2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:
   a. **> 100 mRem TEDE**
   OR
   b. **> 500 mRem CDE Thyroid**
   OR
3. Field survey results at or beyond the site boundary indicate **EITHER**:
   a. Gamma (closed window) dose rates **>100 mR/hr** are expected to continue for **≥ 60 minutes**.
   OR
   b. Analyses of field survey samples indicate **> 500 mRem CDE Thyroid** for **60 minutes** of inhalation.

ALERT

RA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE. 1 2 3 4 5 D

Emergency Action Level (EAL):

Notes:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until dose assessment results are available.

1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 15 minutes**.
   OR
2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:
   a. **> 10 mRem TEDE**
   OR
   b. **> 50 mRem CDE Thyroid**
   OR
3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than **EITHER** of the following at or beyond the site boundary
   a. **10 mRem** TEDE for **60 minutes** of exposure
   OR
   b. **50 mRem** CDE Thyroid for **60 minutes** of exposure
   OR
4. Field survey results at or beyond the site boundary indicate **EITHER**:
   a. Gamma (closed window) dose rates **> 10 mR/hr** are expected to continue for **≥ 60 minutes**.
   OR
   b. Analyses of field survey samples indicate **> 50 mRem CDE Thyroid** for **60 minutes** of inhalation.

UNUSUAL EVENT

RU1 Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM for 60 minutes or longer. 1 2 3 4 5 D

Emergency Action Level (EAL):

Notes:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

1. Reading on **ANY** of the following effluent monitors **> 2 times alarm setpoint** established by a current radioactive release discharge permit for **≥ 60 minutes**.
   - Radwaste Discharge Effluent Monitor (RI-0-17-350)
   OR
   - Discharge Permit specified monitor
   OR
2. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 60 minutes**:
   OR
3. Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates **> 2 times ODCM Limit** with a release duration of **≥ 60 minutes**.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

Table R1 Effluent Monitor Thresholds

Release Path	General Emergency	Site Area Emergency	Alert	Release Path	Unusual Event
Main Stack (RI-0-17-050B Common)	5.57 E+09 uCi/sec	5.57 E+08 uCi/sec	5.57 E+07 uCi/sec	**Main Stack** (RI-0-17-050A/B Common)	6.36 E+05 uCi/sec
Vent Stack (RI-2979B Unit 2 or RI-3979B Unit 3)	1.60 E+08 uCi/sec	1.60 E+07 uCi/sec	1.60 E+06 uCi/sec	**Vent Stack** (RI-2979A/B Unit 2 or RI-3979A/B Unit 3)	1.82 E+04 uCi/sec

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

Abnormal Rad Levels / Radiological Effluents

Radiological Effluents

GENERAL EMERGENCY

RG2 Spent fuel pool level cannot be restored to at least **1.00 ft** as indicated on LI(2)3-19-001A(B) for 60 minutes or longer. 1 2 3 4 5 D

Emergency Action Levels (EAL):

Note: The Emergency Director should declare the General Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Spent fuel pool level cannot be restored to at least **1.00 ft** as indicated on LI-(2)3-19-001A(B) (equivalent to approximately 211' 6" elevation) for **60 minutes** or longer.

Table R2
Refuel Floor ARM's

- Steam Separator Pool, 234 ELEV, 3.7 (7.9)
- Refuel Slot, 234 ELEV, 3.8 (7.10)
- Fuel Pool, 234 ELEV, 3.9 (7.11)
- Refueling Bridge, 234 ELEV, 3.10 (7.12)

SITE AREA EMERGENCY

RS2 Spent fuel pool level at **1.00 ft** as indicated on LI(2)3-19-001A(B). 1 2 3 4 5 D

Emergency Action Level (EAL):

Lowering of spent fuel pool level to **1.00 ft** as indicated on LI-(2)3-19-001A(B) (equivalent to approximately 211' 6" elevation).

Table R3
Areas Requiring Continuous Occupancy

- Main Control Room
- Central Alarm Station – (by survey)

Table R4
Areas with Entry Related Mode Applicability

Area of concern	Entry Related Mode Applicability
Reactor Building 135' all areas	Modes 3, 4 and 5

ALERT

RA2 Significant lowering of water level above, or damage to, irradiated fuel. 1 2 3 4 5 D

Emergency Action Level (EAL):

1. Uncovery of irradiated fuel in the REFUELING PATHWAY.
   OR
2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** Table R2 Radiation Monitor reading **>1000 mR/hr**

   OR
3. Lowering of spent fuel pool level to **10.00 ft** as indicated on LI-(2)3-19-001A(B) (equivalent to approximately 220' 6" elevation).

RA3 Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown. 1 2 3 4 5 D

Emergency Action Level (EAL):

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

1. Dose rate **> 15 mR/hr** in **ANY** of the areas contained in Table R3.
   OR
2. UNPLANNED event results in radiation levels that prohibit or significantly impede access to any of the areas contained in Table R4.

UNUSUAL EVENT

RU2 Unplanned loss of water level above irradiated fuel. 1 2 3 4 5 D

Emergency Action Level (EAL):

1. a. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by **ANY** of the following:
   - Refueling Cavity water level **< 458 inches** on Shutdown/Refuel Range indicator PR/FR-2(3)-06-097.

     OR
   - Spent Fuel Pool level **< 232 feet 3 inches** plant elevation.

     OR
   - Indication or report of a drop in water level in the REFUELING PATHWAY.

   AND

   b. UNPLANNED Area Radiation Monitor reading rise on **ANY** radiation monitor in Table R2.

RU3 Reactor coolant activity greater than Technical Specification allowable limits. 1 2 3

Emergency Action Level (EAL):

1 Air Ejector discharge radiation monitor RIS-2(3)-17-150 A/B **Hi-Hi** alarm.

OR

2. Specific coolant activity **> 4.0 uCi/gm** Dose equivalent I-131.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT
FG1 Loss of ANY two barriers AND Loss or Potential Loss of third barrier. 1 2 3	FS1 Loss or Potential Loss of ANY two barriers. 1 2 3	FA1 ANY Loss or ANY Potential Loss of either Fuel Clad or RCS. 1 2 3

Sub-Category	FC - Fuel Clad		RC – Reactor Coolant System		CT - Containment	
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
1. RCS Activity	Coolant activity > **300 uCi/gm** Dose Equivalent I-131	None	None	None	None	None
2. RPV Water Level	1. Plant conditions indicate that Primary Containment Flooding is required.	2. RPV level **cannot** be restored and maintained > **– 172 inches.** **OR** 3. RPV level **cannot** be determined.	1. RPV level **cannot** be restored and maintained > **–172 inches.** **OR** 2. RPV level **cannot** be determined.	None	None	Plant conditions indicate that Primary Containment Flooding is required.
3. Primary Containment Pressure/ Conditions	None	None	1. Drywell pressure > **2.0 psig.** **AND** 2. Drywell pressure rise due to RCS leakage.	None	1. UNPLANNED Rapid drop in Drywell Pressure following primary containment pressure rise. **OR** 2. Drywell pressure response **not** consistent with LOCA conditions.	3. Drywell pressure > **56 psig** and rising. **OR** 4. a. Drywell or Torus hydrogen concentration > **6%.** **AND** b. Drywell or Torus oxygen concentration > **5%.** **OR** 5. Heat Capacity Limit (T-102 Curve T/T-1 or T/T-2) exceeded.
4. RCS Leak Rate	None	None	1. UNISOLABLE Main Steam Line (MSL), HPCI, Feedwater, RWCU or RCIC line break. **OR** 2 Emergency RPV Depressurization is required.	3. UNISOLABLE primary system leakage that results in **EITHER** of the following:: a. Secondary Containment area temperatures > **T-103 Alarm Setpoint** **OR** b. Secondary Containment area radiation level > **T-103 Alarm Setpoint.**	None	None
5. Primary Containment Radiation	Drywell radiation monitor reading > **9.55E+02 R/hr.**	None	Drywell Radiation monitor reading > **100 R/hr.**	None	None	Drywell radiation monitor reading > **2.20 E+03 R/hr.**
6. Primary Containment Isolation Failure	None	None	None	None	1. UNISOLABLE direct downstream pathway to the environment exists after primary containment isolation signal. **OR** 2. Intentional Primary Containment venting/purging per EOP's or SAMPs due to accident conditions. **OR** 3. UNISOLABLE primary system leakage that results in **EITHER:** • Secondary Containment area temperatures > **T-103 Action Level.** **OR** • Secondary Containment area radiation levels > **T-103 Action Level.**	None
7. ED Judgment	1. Any condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier.	2. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.	1. Any condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.	2. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.	1. Any condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.	2. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
System Malfunction				
Loss of AC Power	**MG1** Prolonged loss of all offsite and all onsite AC power to emergency buses. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1 Loss of **ALL** offsite AC power to unit 4 KV Safeguards Buses. **AND** 2. Failure of E1, E2, E3, and E4 Emergency Diesel Generators to supply power to unit 4KV Safeguards Buses. **AND** 3. **EITHER** of the following: a. Restoration of at least one unit 4KV safeguards Bus in **< 2 hours is <u>not</u>** likely. **OR** b. RPV water level **<u>cannot</u>** be restored and maintained **> -195 inches.**	**MS1** Loss of all Off-site and On-Site AC power to emergency buses for 15 minutes or longer. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. Loss of **ALL** offsite AC Power to unit 4KV Safeguards Buses. **AND** 2. Failure of E1, E2, E3, and E4 Emergency Diesel Generators to supply power to unit 4KV Safeguards Buses. **AND** 3. Failure to restore power to at least one unit 4KV Safeguards bus in **< 15 minutes** from the time of loss of both offsite and onsite AC power.	**MA1** Loss of all but one AC power source to emergency buses for 15 minutes or longer. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. AC power capability to unit 4KV Safeguards Buses reduced to only one of the following power sources for **≥ 15 minutes.** • 2 Emergency Auxiliary Transformer (0AX04) • 3 Emergency Auxiliary Transformer (0BX04) • E1 Diesel Generator • E2 Diesel Generator • E3 Diesel Generator • E4 Diesel Generator **AND** 2. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMS.	**MU1** Loss of all offsite AC power capability to emergency buses for 15 minutes or longer. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Loss of **ALL** offsite AC power capability to unit 4KV Safeguards Buses for **≥15 minutes**.
Loss of DC Power	**MG2** Loss of all AC and Vital DC power sources for 15 minutes or longer. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. Loss of **ALL** offsite AC power to unit 4KV safeguards Buses. **AND** 2. Failure of E1, E2, E3, and E4 Emergency Diesel Generators to supply power to unit 4KV Safeguards Buses. **AND** 3. Voltage is **< 107.5 VDC** on unit 125 VDC battery buses 2(3)0D021, 2(3)0D022, 2(3)0D023, and 2(3)0D024. **AND** 4. **ALL** AC and Vital DC power sources have been lost for **≥ 15 minutes.**	**MS2** Loss of all Vital DC power for 15 minutes or longer. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Voltage is **<107.5 VDC** on 125 VDC battery buses 2(3)0D021, 2(3)0D022, 2(3)0D023, and 2(3)0D024 for **≥15 minutes**.		

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
System Malfunction				
RPS Failure		**MS3** Inability to shutdown the reactor causing a challenge to core cooling or RCS heat removal. 1 2 **Emergency Action Level (EAL):** 1. Automatic scram did **not** shutdown the reactor as indicated by Reactor Power > **4%**. **AND** 2. **ALL** manual / ARI actions to shutdown the reactor have been unsuccessful as indicated by Reactor Power > **4%**. **AND** 3. **EITHER** of the following conditions exist: • RPV water level **cannot** be restored and maintained > **-195 inches** **OR** • Heat Capacity Limit (T-102 Curve T/T-1 or T/T-2) exceeded.	**MA3** Automatic or manual trip fails to shutdown the reactor, and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor. 1 2 **Emergency Action Level (EAL):** **Note:** A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies. 1. Automatic or manual scram did **not** shutdown the reactor as indicated by Reactor Power > **4%**. **AND** 2. Manual / ARI actions taken at the Reactor Console are **not** successful in shutting down the reactor as indicated by Reactor Power > **4%**.	**MU3** Automatic or manual trip fails to shutdown the reactor. 1 2 **Emergency Action Level (EAL):** **Note:** A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies. 1. a. Automatic scram did **not** shutdown the reactor as indicated by Reactor Power > **4%**. **AND** b. Subsequent manual / ARI action taken at the Reactor Console is successful in shutting down the reactor as indicated by Reactor Power ≤ **4%**. **OR** 2. a. Manual scram did **not** shutdown the reactor as indicated by Reactor Power > **4%**. **AND** b. **EITHER** of the following: 1. Subsequent manual / ARI action taken at the Reactor Console is successful in shutting down the reactor as indicated by Reactor Power ≤ **4%**. **OR** 2. Subsequent automatic / ARI scram is successful in shutting down the reactor as indicated by Reactor Power ≤ **4%**.
Control Room Indications	**Table M1 Control Room Parameters** • Reactor Power • RPV Water Level • RPV Pressure • Primary Containment Pressure • Torus Level • Torus Temperature	**Table M2 Significant Transients** • Automatic or Manual Runback **>25%** thermal reactor power • Electrical Load Rejection **>25%** full electrical load • Reactor Scram • ECCS Actuation • Thermal Power oscillations > **10%**	**MA4** UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. UNPLANNED event results in the inability to monitor **ANY** Table M1 parameters from within the Control Room for ≥ **15 minutes.** **AND** 2. **ANY** Table M2 transient in progress.	**MU4** UNPLANNED loss of Control Room indications for 15 minutes or longer. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. UNPLANNED event results in the inability to monitor **ANY** Table M1 parameters from within the Control Room for ≥ **15 minutes.**

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
System Malfunction				
Hazard affects Safety System			**MA5** Hazardous event affecting a SAFETY SYSTEM required for the current operating mode. 1 2 3 **Emergency Action Level (EAL):** **Note:** If it is determined that the conditions of MA5 are not met then assess the event via HU3, HU4, or HU6. 1. The occurrence of **ANY** of the following hazardous events: • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • Other events with similar hazard characteristics as determined by the Shift Manager **AND** 2. **EITHER** of the following: a. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode. **OR** b. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure required by Technical Specifications for the current operating mode.	
RCS Leak				**MU6** RCS leakage for 15 minutes or longer. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. RCS unidentified or pressure boundary leakage **in the Drywell > 10 gpm** for **≥ 15 minutes** **OR** 2. RCS identified leakage in the Drywell **>25 gpm** for **≥ 15 minutes** **OR** 3. Leakage from the RCS to a location outside the Drywell **>25 gpm** for **≥ 15 minutes**

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
System Malfunction			
Communications		Table M3 Communications Capability System / Onsite / Offsite / NRC Station Radio System: X / / / Plant Public Address (PA): X / / / OMNI System: X / X / / Station Phones: X / X / X Satellite Phones: / X / X NARS: / X / / HPN: / X / X ENS: / X / X	**MU7** Loss of all On-site or Off-site communication capabilities. 1 2 3 **Emergency Action Level (EAL):** 1. Loss of **ALL** Table M3 **Onsite** communications capability affecting the ability to perform routine operations. **OR** 2. Loss of **ALL** Table M3 **Offsite** communication capability affecting the ability to perform offsite notifications. **OR** 3. Loss of **ALL** Table M3 **NRC** communication capability affecting the ability to perform NRC notifications.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Hostile Action	**HG1** HOSTILE ACTION resulting in loss of physical control of the facility 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA. **AND** 2. a. **ANY** Table H1 safety function **cannot** be controlled or maintained. **OR** b. Damage to spent fuel has occurred or is IMMINENT	**HS1** HOSTILE ACTION within the PROTECTED AREA 1 2 3 4 5 D **Emergency Action Level (EAL):** A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.	**HA1** HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes. 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. A validated notification from NRC of an aircraft attack threat **< 30 minutes** from the site. **OR** 2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLED AREA.	**HU1** Confirmed SECURITY CONDITION or threat. 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities. **OR** 2. A validated notification from the NRC providing information of an aircraft threat. **OR** 3. Notification by the Security Force of a SECURITY CONDITION that does **not** involve a HOSTILE ACTION.
Transfer of Plant Control	**Table H1 Safety Functions** • Reactivity Control (ability to shutdown the reactor and keep it shutdown) • RPV Water Level (ability to cool the core) • RCS Heat Removal (ability to maintain a heatsink)	**HS2** Inability to control a key safety function from outside the Control Room 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per: • SE-1, Plant Shutdown from the Remote Shutdown Panel **OR** • SE-10, Plant Shutdown from the Alternative Shutdown Panels **AND** 2. Control of **ANY** Table H1 key safety function is **not** reestablished in **< 15 minutes**.	**HA2** Control Room evacuation resulting in transfer of plant control to alternate locations 1 2 3 4 5 D **Emergency Action Level (EAL):** A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per: • SE-1, Plant Shutdown from the Remote Shutdown Panel **OR** • SE-10, Plant Shutdown from the Alternative Shutdown Panels	

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Fire		**Table H2 Vital Areas** • Reactor Building (when inerted the Drywell is exempt) • Control Room • Diesel Generator Building • Emergency Pump Structure • Inner Screen Structure • Emergency Cooling Tower • Emergency Switchgear/Battery Rooms • Cable Spread Room	**HU3** FIRE potentially degrading the level of safety of the plant. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Escalation of the emergency classification level would be via IC CA2 or MA5 1. A FIRE in **ANY** Table H2 area is **not** extinguished in **< 15-minutes** of **ANY** of the following FIRE detection indications: • Report from the field (i.e., visual observation) • Receipt of multiple (more than 1) fire alarms or indications • Field verification of a single fire alarm **OR** 2. a. Receipt of a single fire alarm in **ANY** Table H2 area (i.e., no other indications of a FIRE). **AND** b. The existence of a FIRE is **not** verified in **< 30 minutes** of alarm receipt. **OR** 3. A FIRE within the plant PROTECTED AREA or ISFSI PROTECTED AREA not extinguished in **< 60-minutes** of the initial report, alarm or indication. **OR** 4. A FIRE within the plant PROTECTED AREA or ISFSI PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Earthquake			**HU4** Seismic event greater than OBE levels 1 2 3 4 5 D **Emergency Action Level (EAL):** Note: Escalation of the emergency classification level would be via IC CA2 or MA5 For emergency classification if EAL 2.b is not able to be confirmed, then the occurrence of a seismic event is confirmed in manner deemed appropriate by the Shift Manager or Emergency Director in ≤ **15 mins** of the event. 1. Seismic event > **Operating Basis Earthquake (OBE)** as indicated by the Alarm on Panel 316 A-5."OPERATING BASIS EARTHQUAKE EXCEEDED" **OR** 2. When Seismic Monitoring Equipment is <u>not</u> available: a. Control Room personnel feel an actual or potential seismic event. **AND** b. **ANY** one of the following confirmed in ≤ **15 mins** of the event: • The earthquake resulted in Modified Mercalli Intensity (MMI) ≥ **VI** and occurred ≤ **3.5 miles** of the plant. • The earthquake was magnitude ≥ **6.0** • The earthquake was magnitude ≥ **5.0** and occurred ≤ **125 miles** of the plant.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Toxic Gas		**Table H3** **Areas with Entry Related Mode Applicability** **Area of concern** — **Entry Related Mode Applicability** **Reactor Building** 135' all areas — Modes 3, 4 and 5 **Control Room** — Modes 1, 2, 3, 4, and 5	**HA5** Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown. 1 2 3 4 5 **Emergency Action Level (EAL):** **Note:** If the equipment in the listed room or area was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted. 1. Release of a toxic, corrosive, asphyxiant or flammable gas in **ANY** Table H3 area. **AND** 2. Entry into the room or area is prohibited or impeded	
Hazardous Event				**HU6** Hazardous Event 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** EAL #4 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents. Escalation of the emergency classification level would be via IC CA2 or MA5 1. Tornado strike within the PROTECTED AREA. **OR** 2. Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component required by Technical Specifications for the current operating mode. **OR** 3. Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release). **OR** 4. A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles. **OR** 5. Abnormal River level, as indicated by **EITHER:** • **> 112 ft.** (high level) **OR** • **< 98.5 ft.** (low level)

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Emergency Director Judgment	**HG7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a GENERAL EMERGENCY. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	**HS7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a SITE AREA EMERGENCY. 1 2 3 4 5 D **Emergency Action Level (EAL):** 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.	**HA7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT. 1 2 3 4 5 D **Emergency Action Level (EAL):** 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.	**HU7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
ISFSI Malfunction				
ISFSI				**E-HU1** Damage to a loaded cask CONFINEMENT BOUNDARY. 1 2 3 4 5 D **Emergency Action Level (EAL):** Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading: 1. Cask numbers 45, 46, and 47 only: • **> 240 mrem/hr gamma or > 20 mrem/hr neutron** on the top (protective cover). **OR** • **> 150 mrem/hr gamma or > 20 mrem/hr neutron** on the sides of the radial neutron shield. **OR** • **> 720 mrem/hr gamma or > 90 mrem/hr neutron** on the side surfaces of the cask above the radial neutron shield. **OR** • **> 420 mrem/hr gamma or > 140 mrem/hr neutron** on the side surfaces of the cask below the radial neutron shield. **OR** 2. All casks except for cask numbers 45, 46, and 47: • **> 350 mrem/hr gamma or > 30 mrem/hr neutron** on the top (protective cover). **OR** • **> 250 mrem/hr gamma or > 60 mrem/hr neutron** on the sides of the radial neutron shield. **OR** • **> 1100 mrem/hr gamma or > 250 mrem/hr neutron** on the side surfaces of the cask above the radial neutron shield. **OR** • **> 800 mrem/hr gamma or > 600 mrem/hr neutron** on the side surfaces of the cask below the radial neutron shield.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Abnormal Rad Levels / Radiological Effluents			
Radiological Effluents **RG1** Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mRem TEDE or 5,000 mRem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** • The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. • Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. • The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until dose assessment results are available. 1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 15 minutes.** **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER:** a. **> 1000 mRem TEDE** **OR** b. **> 5000 mRem CDE Thyroid** **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER:** a. Gamma (closed window) dose rates **>1000 mR/hr** are expected to continue for **≥ 60 minutes.** **OR** b. Analyses of field survey samples indicate **> 5000 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RS1** Release of gaseous radioactivity resulting in offsite dose greater than 100 mRem TEDE or 500 mRem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** • The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. • Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. • The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until dose assessment results are available. 1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1value** for **≥ 15 minutes.** **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER:** a. **> 100 mRem TEDE** **OR** b. **> 500 mRem CDE Thyroid** **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER:** a. Gamma (closed window) dose rates **>100 mR/hr** are expected to continue for **≥ 60 minutes.** **OR** b. Analyses of field survey samples indicate **> 500 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RA1** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** Notes: • The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. • Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. • The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until dose assessment results are available. 1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 15 minutes.** **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER:** a. **> 10 mRem TEDE** **OR** b. **> 50 mRem CDE Thyroid** **OR** 3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than **EITHER** of the following at or beyond the site boundary a. **10 mRem** TEDE for **60 minutes** of exposure **OR** b. **50 mRem** CDE Thyroid for **60 minutes** of exposure **OR** 4. Field survey results at or beyond the site boundary indicate **EITHER:** a. Gamma (closed window) dose rates **> 10 mR/hr** are expected to continue for **≥ 60 minutes.** **OR** b. Analyses of field survey samples indicate **> 50 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RU1** Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM for 60 minutes or longer. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** • The Emergency Director should declare the event promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes. • Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. 1. Reading on **ANY** of the following effluent monitors **> 2 times alarm setpoint** established by a current radioactive release discharge permit for **≥ 60 minutes.** • Radwaste Discharge Effluent Monitor (RI-0-17-350) **OR** • Discharge Permit specified monitor **OR** 2. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 60 minutes:** **OR** 3. Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates **> 2 times ODCM Limit** with a release duration of **≥ 60 minutes.**

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

Table R1 Effluent Monitor Thresholds

Release Path	General Emergency	Site Area Emergency	Alert		Release Path	Unusual Event
Main Stack (RI-0-17-050B Common)	5.57 E+09 uCi/sec	5.57 E+08 uCi/sec	5.57 E+07 uCi/sec		**Main Stack** (RI-0-17-050A/B Common)	6.36 E+05 uCi/sec
Vent Stack (RI-2979B Unit 2 or RI-3979B Unit 3)	1.60 E+08 uCi/sec	1.60 E+07 uCi/sec	1.60 E+06 uCi/sec		**Vent Stack** (RI-2979A/B Unit 2 or RI-3979A/B Unit 3)	1.82 E+04 uCi/sec

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Abnormal Rad Levels / Radiological Effluents			
Radiological Effluents **RG2** Spent fuel pool level cannot be restored to at least **1.00 ft** as indicated on LI(2)3-19-001A(B) for 60 minutes or longer. 1 2 3 4 5 D **Emergency Action Levels (EAL):** **Note:** The Emergency Director should declare the General Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Spent fuel pool level cannot be restored to at least **1.00 ft** as indicated on LI-(2)3-19-001A(B) (equivalent to approximately 211' 6" elevation) for **60 minutes** or longer. **Table R2 Refuel Floor ARM's** • Steam Separator Pool, 234 ELEV, 3.7 (7.9) • Refuel Slot, 234 ELEV, 3.8 (7.10) • Fuel Pool, 234 ELEV, 3.9 (7.11) • Refueling Bridge, 234 ELEV, 3.10 (7.12)	**RS2** Spent fuel pool level at **1.00 ft** as indicated on LI(2)3-19-001A(B). 1 2 3 4 5 D **Emergency Action Level (EAL):** Lowering of spent fuel pool level to **1.00 ft** as indicated on LI-(2)3-19-001A(B) (equivalent to approximately 211' 6" elevation). **Table R3 Areas Requiring Continuous Occupancy** • Main Control Room • Central Alarm Station – (by survey) **Table R4 Areas with Entry Related Mode Applicability** **Area of concern** / **Entry Related Mode Applicability** **Reactor Building** 135' all areas / Modes 3, 4 and 5	**RA2** Significant lowering of water level above, or damage to, irradiated fuel. 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. Uncovery of irradiated fuel in the REFUELING PATHWAY. **OR** 2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** Table R2 Radiation Monitor reading **>1000 mR/hr** **OR** 3. Lowering of spent fuel pool level to **10.00 ft** as indicated on LI-(2)3-19-001A(B) (equivalent to approximately 220' 6" elevation). **RA3** Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** If the equipment in the listed room or area was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted 1. Dose rate **> 15 mR/hr** in **ANY** of the areas contained in Table R3. **OR** 2. UNPLANNED event results in radiation levels that prohibit or significantly impede access to any of the areas contained in Table R4.	**RU2** Unplanned loss of water level above irradiated fuel. 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. a. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by **ANY** of the following: • Refueling Cavity water level **< 458 inches** on Shutdown/Refuel Range indicator PR/FR-2(3)-06-097. **OR** • Spent Fuel Pool level **< 232 feet 3 inches** plant elevation. **OR** • Indication or report of a drop in water level in the REFUELING PATHWAY. **AND** b. UNPLANNED Area Radiation Monitor reading rise on **ANY** radiation monitor in Table R2.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Cold Shutdown / Refueling System Malfunctions				
Loss of AC Power			**CA1** Loss of all offsite and onsite AC power to emergency buses for 15 minutes or longer. 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. Loss of **ALL** offsite AC power to unit 4KV Safeguards Buses. **AND** 2. Failure of E1, E2, E3, and E4 Emergency Diesel Generators to supply power to unit 4KV Safeguards Buses. **AND** 3. Failure to restore power to at least one unit 4KV Safeguards bus in **< 15 minutes** from the time of loss of both offsite and onsite AC power.	**CU1** Loss of all but one AC power source to emergency buses for 15 minutes or longer. 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. AC power capability to unit 4KV Safeguards Buses reduced to only one of the following power sources for **≥ 15 minutes.** • 2 Emergency Auxiliary Transformer (0AX04) • 3 Emergency Auxiliary Transformer (0BX04) • E1 Diesel Generator • E2 Diesel Generator • E3 Diesel Generator • E4 Diesel Generator **AND** 2. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMS.
Safety System			**CA2** Hazardous event affecting SAFETY SYSTEM required for the current operating mode. 4 5 **Emergency Action Level (EAL):** **Note:** If it is determined that the conditions of CA2 are not met then assess the event via HU3, HU4, or HU6. 1. The occurrence of **ANY** of the following hazardous events: • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • Other events with similar hazard characteristics as determined by the Shift Manager **AND** 2. **EITHER** of the following: a. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode. **OR** b. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure required by Technical Specifications for the current operating mode.	

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Cold Shutdown / Refueling System Malfunctions				
DC Power				**CU3** Loss of Vital DC power for 15 minutes or longer. 4 5 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Voltage is **< 107.5 VDC** on required 125 VDC battery buses 2(3)0D021, 2(3)0D022 , 2(3)0D023 , and 2(3)0D024 for **≥ 15 minutes**.
Communications			**Table C1 Communications Capability** System / Onsite / Offsite / NRC Station Radio System: X Plant Public Address (PA): X OMNI System: X, X Station Phones: X, X, X Satellite Phones: X, X NARS: X HPN: X, X ENS: X, X	**CU4** Loss of all onsite or offsite communication capabilities. 4 5 D **Emergency Action Level (EAL):** 1. Loss of **ALL** Table C1 **Onsite** communications capability affecting the ability to perform routine operations. **OR** 2. Loss of **ALL** Table C1 **Offsite** communication capability affecting the ability to perform offsite notifications. **OR** 3. Loss of **ALL** Table C1 **NRC** communication capability affecting the ability to perform NRC notifications.
Heat Sink		**Table C2 RCS Heat-up Duration Thresholds** RCS Status / Containment Closure Status / Heat-up Duration Intact / Not Applicable / 60 minutes* Not Intact / Established / 20 minutes* Not Intact / Not Established / 0 minutes * If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, then EAL #1 is **not** applicable.	**CA5** Inability to maintain plant in cold shutdown 4 5 **Emergency Action Levels (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when heat removal function is available does not warrant classification. 1. UNPLANNED rise in RCS temperature **> 212°F** for **> Table C2 duration**. **OR** 2. UNPLANNED RCS pressure rise **> 10 psig** as a result of temperature rise.	**CU5** UNPLANNED rise in RCS temperature. 4 5 **Emergency Action Levels (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when heat removal function is available does not warrant classification. 1. UNPLANNED rise in RCS temperature **> 212°F.** **OR** 2. Loss of the following for **≥ 15 minutes.** • **ALL** RCS temperature indications **AND** • **ALL** RPV level indications

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Cold Shutdown / Refueling System Malfunctions				
RCS Leakage / Inventory	**CG6** Loss of RPV inventory affecting fuel clad integrity with containment challenged. 4 5 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1 a. RPV water level **< -172 inches (TAF)** for **≥ 30minutes.** **AND** b. **ANY** Containment Challenge Indication (Table C4) **OR** 2. a. RPV water level **cannot** be monitored for **≥ 30 minutes.** **AND** b. Core uncovery is indicated by **ANY** of the following: • Table C3 indications of a sufficient magnitude to indicate core uncovery. **OR** • **ANY** Table C5 Refuel Floor Area Radiation Monitor **>3 R/hr** **AND** c. **ANY** Containment Challenge Indication (Table C4)	**CS6** Loss of RPV inventor y affecting core decay heat removal capabilities. 4 5 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. With CONTAINMENT CLOSURE **not** established, RPV water level **< -160 inches** **OR** 2. With CONTAINMENT CLOSURE established, RPV water level **< - 172 inches (TAF)** **OR** 3. a. RPV water level **cannot** be monitored for **≥ 30 minutes** **AND** b.Core uncovery is indicated by **ANY** of the following: • Table C3 indications of a sufficient magnitude to indicate core uncovery. **OR** • **ANY** Table C5 Refuel Floor Area Radiation Monitor **>3 R/hr**	**CA6** Loss of RPV inventory 4 5 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. Loss of RPV inventory as indicated by level **< - 48 inches.** **OR** 2. a. RPV water level **cannot** be monitored for **≥ 15 minutes.** **AND** b. Loss of RPV inventory per Table C3 indications	**CU6** UNPLANNED loss of reactor RPV inventory for 15 minutes or longer. 4 5 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. UNPLANNED loss of reactor coolant results in the inability to restore and maintain RPV water level to above the **procedurally established lower limit** for **≥ 15 minutes.** **OR** 2. a. RPV water level **cannot** be monitored **AND** b. Loss of RPV inventory per Table C3 indications.
	Table C3 Indications of RCS Leakage • UNPLANNED floor or equipment sump level rise* • UNPLANNED Torus level rise* • UNPLANNED vessel make up rate rise • Observation of leakage or inventory loss *Rise in level is attributed to a loss of RPV inventory	**Table C4 Containment Challenge Indications** • Primary Containment Hydrogen Concentration **≥ 6%** and Oxygen **≥ 5%** • UNPLANNED rise in containment pressure • CONTAINMENT CLOSURE **not** established* • **ANY** Secondary Containment radiation monitor **> T-103 Action Level** * if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncovery time limit, then escalation to a General Emergency is **not** required.	**Table C5 Refuel Floor ARM's** • Steam Separator Pool, 234 ELEV, 3.7 (7.9) • Refuel Slot, 234 ELEV, 3.8 (7.10) • Fuel Pool, 234 ELEV, 3.9 (7.11) • Refueling Bridge, 234 ELEV, 3.10 (7.12)	

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Hostile Action	**HG1** HOSTILE ACTION resulting in loss of physical control of the facility 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA. **AND** 2. a. **ANY** Table H1 safety function **cannot** be controlled or maintained. **OR** b. Damage to spent fuel has occurred or is IMMINENT	**HS1** HOSTILE ACTION within the PROTECTED AREA 1 2 3 4 5 D **Emergency Action Level (EAL):** A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.	**HA1** HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes. 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. A validated notification from NRC of an aircraft attack threat **< 30 minutes** from the site. **OR** 2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLED AREA.	**HU1** Confirmed SECURITY CONDITION or threat. 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities. **OR** 2. A validated notification from the NRC providing information of an aircraft threat. **OR** 3. Notification by the Security Force of a SECURITY CONDITION that does **not** involve a HOSTILE ACTION.
Transfer of Plant Control	**Table H1 Safety Functions** • Reactivity Control (ability to shutdown the reactor and keep it shutdown) • RPV Water Level (ability to cool the core) • RCS Heat Removal (ability to maintain a heatsink)	**HS2** Inability to control a key safety function from outside the Control Room 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per: • SE-1, Plant Shutdown from the Remote Shutdown Panel – Procedure **OR** • SE-10, Plant Shutdown from the Alternative Shutdown Panels – Procedure **AND** 2. Control of **ANY** Table H1 key safety function is **not** reestablished in **< 15 minutes**.	**HA2** Control Room evacuation resulting in transfer of plant control to alternate locations 1 2 3 4 5 D **Emergency Action Level (EAL):** A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per: • SE-1, Plant Shutdown from the Remote Shutdown Panel – Procedure **OR** • SE-10, Plant Shutdown from the Alternative Shutdown Panels – Procedure	

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Fire		**Table H2 Vital Areas** • Reactor Building (when inerted the Drywell is exempt) • Control Room • Diesel Generator Building • Emergency Pump Structure • Inner Screen Structure • Emergency Cooling Tower • Emergency Switchgear/Battery Rooms • Cable Spread Room	**HU3** FIRE potentially degrading the level of safety of the plant. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Escalation of the emergency classification level would be via IC CA2 or MA5 1. A FIRE in **ANY** Table H2 area is **not** extinguished in **< 15-minutes** of **ANY** of the following FIRE detection indications: • Report from the field (i.e., visual observation) • Receipt of multiple (more than 1) fire alarms or indications • Field verification of a single fire alarm **OR** 2. a. Receipt of a single fire alarm in **ANY** Table H2 area (i.e., no other indications of a FIRE). **AND** b. The existence of a FIRE is **not** verified in **< 30 minutes** of alarm receipt. **OR** 3. A FIRE within the plant PROTECTED AREA or ISFSI PROTECTED AREA not extinguished in **< 60-minutes** of the initial report, alarm or indication. **OR** 4. A FIRE within the plant PROTECTED AREA or ISFSI PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Earthquake			**HU4** Seismic event greater than OBE levels 1 2 3 4 5 D **Emergency Action Level (EAL):** Note: Escalation of the emergency classification level would be via IC CA2 or MA5 For emergency classification if EAL 2.b is not able to be confirmed, then the occurrence of a seismic event is confirmed in manner deemed appropriate by the Shift Manager or Emergency Director in ≤ **15 mins** of the event. 1. Seismic event > **Operating Basis Earthquake (OBE)** as indicated by the Alarm on Panel 316 A-5."OPERATING BASIS EARTHQUAKE EXCEEDED" **OR** 2. When Seismic Monitoring Equipment is **not** available: a. Control Room personnel feel an actual or potential seismic event. **AND** b. **ANY** one of the following confirmed in ≤ **15 mins** of the event: • The earthquake resulted in Modified Mercalli Intensity (MMI) ≥ **VI** and occurred ≤ **3.5 miles** of the plant. • The earthquake was magnitude ≥ **6.0** • The earthquake was magnitude ≥ **5.0** and occurred ≤ **125 miles** of the plant.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Toxic Gas		**Table H3** **Areas with Entry Related Mode Applicability** **Area of concern** — **Entry Related Mode Applicability** **Reactor Building** 135' all areas — Modes 3, 4 and 5 **Control Room** — Modes 1, 2, 3, 4, and 5	**HA5** Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown. 1 2 3 4 5 **Emergency Action Level (EAL):** **Note**: If the equipment in the listed room or area was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted. 1. Release of a toxic, corrosive, asphyxiant or flammable gas in **ANY** Table H3 area. **AND** 2. Entry into the room or area is prohibited or impeded	
Hazardous Event				**HU6** Hazardous Event 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** EAL #4 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents. Escalation of the emergency classification level would be via IC CA2 or MA5 1. Tornado strike within the PROTECTED AREA. **OR** 2. Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component required by Technical Specifications for the current operating mode. **OR** 3. Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release). **OR** 4. A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles. **OR** 5. Abnormal River level, as indicated by **EITHER**: • **> 112 ft.** (high level) **OR** • **< 98.5 ft.** (low level)

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Emergency Director Judgment	**HG7** Other conditions exist which in the 1 2 3 4 5 D judgment of the Emergency Director warrant declaration of a GENERAL EMERGENCY. **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	**HS7** Other conditions exist which in the 1 2 3 4 5 D judgment of the Emergency Director warrant declaration of a SITE AREA EMERGENCY. **Emergency Action Level (EAL):** 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.	**HA7** Other conditions exist which in the 1 2 3 4 5 D judgment of the Emergency Director warrant declaration of an ALERT. **Emergency Action Level (EAL):** 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.	**HU7** Other conditions exist which in the 1 2 3 4 5 D judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT. **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

TABLE PBAPS 2-1 Emergency action Level (EAL) Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
ISFSI Malfunction			
ISFSI			**E-HU1** Damage to a loaded cask CONFINEMENT BOUNDARY. 1 2 3 4 5 D **Emergency Action Level (EAL):** Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading: 1. Cask numbers 45, 46, and 47 only: • **> 240 mrem/hr gamma or > 20 mrem/hr neutron** on the top (protective cover). **OR** • **> 150 mrem/hr gamma or > 20 mrem/hr neutron** on the sides of the radial neutron shield. **OR** • **> 720 mrem/hr gamma or > 90 mrem/hr neutron** on the side surfaces of the cask above the radial neutron shield. **OR** • **> 420 mrem/hr gamma or > 140 mrem/hr neutron** on the side surfaces of the cask below the radial neutron shield. **OR** 2. All casks except for cask numbers 45, 46, and 47: • **> 350 mrem/hr gamma or > 30 mrem/hr neutron** on the top (protective cover). **OR** • **> 250 mrem/hr gamma or > 60 mrem/hr neutron** on the sides of the radial neutron shield. **OR** • **> 1100 mrem/hr gamma or >250 mrem/hr neutron** on the side surfaces of the cask above the radial neutron shield. **OR** • **> 800 mrem/hr gamma or > 600 mrem/hr neutron** on the side surfaces of the cask below the radial neutron shield.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RG1

Initiating Condition:

Release of gaseous radioactivity resulting in offsite dose greater than 1000 mRem TEDE or 5000 mRem thyroid CDE.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Notes:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 15 minutes**.

   OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:

   a. **> 1000 mRem TEDE**

   OR

   b. **> 5000 mRem CDE Thyroid**

   OR

3. Field survey results at or beyond the site boundary indicate **EITHER**:

   a. Gamma (closed window) dose rates **>1000 mR/hr** are expected to continue for **≥ 60 minutes**.

   OR

   b. Analyses of field survey samples indicate **> 5000 mRem CDE Thyroid** for **60 minutes** of inhalation.

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RG1 (cont)

Emergency Action Level (EAL) (cont):

Table R1 – Effluent Monitor Thresholds	
Release Path	**General Emergency**
Main Stack (RI-0-17-050B Common)	5.57 E+09 uCi/sec
Vent Stack (RI-2979B Unit 2 or RI-3979B Unit 3)	1.60 E+08 uCi/sec

Basis:

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

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

The TEDE dose is set at the EPA PAG of 1000 mRem while the 5000 mRem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Basis Reference(s):

1. NEI 99-01 Rev 6, AG1
2. Peach Bottom ODCM
3. EP-EAL-0607, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values Peach Bottom Atomic Power Station
4. EP-AA-112-500, Emergency Environmental Monitoring

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RS1

Initiating Condition:

Release of gaseous radioactivity resulting in offsite dose greater than 100 mRem TEDE or 500 mRem thyroid CDE.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Notes:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 15 minutes**.

   OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:

   a. **> 100 mRem TEDE**

   OR

   b. **> 500 mRem CDE Thyroid**

   OR

3. Field survey results at or beyond the site boundary indicate **EITHER**:

   a. Gamma (closed window) dose rates **>100 mR/hr** are expected to continue for **≥ 60 minutes**.

   OR

   b. Analyses of field survey samples indicate **> 500 mRem CDE Thyroid** for **60 minutes** of inhalation.

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RS1 (cont)

Emergency Action Level (EAL) (cont):

Table R1 – Effluent Monitor Thresholds	
Release Path	**Site Area Emergency**
Main Stack (RI-0-17-050B Common)	5.57 E+08 uCi/sec
Vent Stack (RI-2979B Unit 2 or RI-3979B Unit 3)	1.60 E+07 uCi/sec

Basis:

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

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

The TEDE dose is set at 10% of the EPA PAG of 1000 mRem while the 500 mRem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

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

Basis Reference(s):

1. NEI 99-01 Rev 6, AS1
2. Peach Bottom ODCM
3. EP-EAL-0607, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values Peach Bottom Atomic Power Station
4. EP-AA-112-500, Emergency Environmental Monitoring

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RA1

Initiating Condition:

Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRem TEDE or 50 mRem thyroid CDE.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Notes:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

1. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 15 minutes**.

   OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:

   a. **> 10 mRem TEDE**

   OR

   b. **> 50 mRem CDE Thyroid**

   OR

3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than **EITHER** of the following at or beyond the site boundary

   a. **10 mRem** TEDE for **60 minutes** of exposure

   OR

   b. **50 mRem** CDE Thyroid for **60 minutes** of exposure

   OR

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RA1 (cont)

Emergency Action Level (EAL) (cont):

4. Field survey results at or beyond the site boundary indicate **EITHER**:

   a. Gamma (closed window) dose rates **> 10 mR/hr** are expected to continue for **≥ 60 minutes**.

   OR

   b. Analyses of field survey samples indicate **> 50 mRem CDE Thyroid** for **60 minutes** of inhalation.

Table R1 – Effluent Monitor Thresholds	
Release Path	**Alert**
Main Stack (RI-0-17-050B Common)	5.57 E+07 uCi/sec
Vent Stack (RI-2979B Unit 2 or RI-3979B Unit 3)	1.60 E+06 uCi/sec

Basis:

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

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

The TEDE dose is set at 1% of the EPA PAG of 1000 mRem while the 50 mRem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

Escalation of the emergency classification level would be via IC RS1

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RA1 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, AA1
2. Peach Bottom ODCM
3. EP-EAL-0607, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values Peach Bottom Atomic Power Station
4. EP-EAL-0614, Peach Bottom Criteria for Choosing Radiological Liquid Effluent EAL Threshold Values

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RU1

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Notes:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

1. Reading on **ANY** of the following effluent monitors **> 2 times alarm setpoint** established by a current radioactive release discharge permit for **≥ 60 minutes**.
   - Radwaste Discharge Effluent Monitor (RI-0-17-350)

     OR
   - Discharge Permit specified monitor

   OR
2. Readings on **ANY** Table R1 Effluent Monitor **> Table R1 value** for **≥ 60 minutes**:

   OR
3. Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates **> 2 times ODCM Limit** with a release duration of **≥ 60 minutes**.

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RU1 (cont)

Emergency Action Level (EAL) (cont):

Table R1 – Effluent Monitor Thresholds	
Release Path	**Unusual Event**
Main Stack (RI-0-17-050B Common)	6.36 E+05 uCi/sec
Main Stack (RI-0-17-050A Common)	6.36 E+05 uCi/sec
Vent Stack (RI-2979B Unit 2 or RI-3979B Unit 3)	1.82 E+04 uCi/sec
Vent Stack (RI-2979A Unit 2 or RI-3979A Unit 3)	1.82 E+04 uCi/sec

Basis:

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

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

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

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

EAL #1 Basis

This EAL addresses radioactivity releases that cause effluent radiation monitor readings to exceed 2 times the limit established by a radioactivity discharge permit. This EAL will typically be associated with planned batch releases from non-continuous release pathways (e.g., radwaste, waste gas).

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RU1 (cont)

Basis (cont):

The effluent monitors listed are those normally used for planned discharges. If a discharge is performed using a different flowpath or effluent monitor other than those listed (e.g., a portable or temporary effluent monitor), then the declaration criteria will be based on the monitor specified in the Discharge Permit.

EAL #2 Basis

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

EAL #3 Basis

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

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

Basis Reference(s):

1. NEI 99-01 Rev 6, AU1
2. Peach Bottom ODCM
3. EP-EAL-0607, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values Peach Bottom Atomic Power Station

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RG2

Initiating Condition:

Spent fuel pool level cannot be restored to at least **1.00 ft** as indicated on LI(2)3-19-001A(B) for 60 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note: The Emergency Director should declare the General Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Spent fuel pool level cannot be restored to at least **1.00 ft** as indicated on LI(2)3-19-001A(B) (equivalent to approximately 211' 6" elevation)for **60 minutes** or longer.

Basis:

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

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

Basis Reference(s):

1. NEI 99-01 Rev 6, AG2
2. PSTG APPENDIX B - T-103 Rev. 12, Exelon Nuclear PEACH BOTTOM UNITS 2 AND 3, SECONDARY CONTAINMENT CONTROL GUIDELINE

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RS2

Initiating Condition:

Spent fuel pool level at **1.00 ft** as indicated on LI(2)3-19-001A(B)

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Lowering of spent fuel pool level to**1.00 ft** as indicated on LI(2)3-19-001A(B) (equivalent to approximately 211' 6" elevation)

Basis:

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

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

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

Basis Reference(s):

1. NEI 99-01 Rev 6, AS2
2. PSTG APPENDIX B - T-103 Rev. 12, Exelon Nuclear PEACH BOTTOM UNITS 2 AND 3, SECONDARY CONTAINMENT CONTROL GUIDELINE

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RA2

Initiating Condition:

Significant lowering of water level above, or damage to, irradiated fuel.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

1. Uncovery of irradiated fuel in the REFUELING PATHWAY.

   OR

2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** Table R2 Radiation Monitor reading **>1000 mR/hr.**

   OR

3. Lowering of spent fuel pool level to **10.00 ft** as indicated on LI(2)3-19-001A(B) (equivalent to approximately 220' 6" elevation)

Table R2 Refuel Floor ARM's
• Steam Separator Pool, 234 ELEV, 3.7 (7.9) • Refuel Slot, 234 ELEV, 3.8 (7.10) • Fuel Pool, 234 ELEV, 3.9 (7.11) • Refueling Bridge, 234 ELEV, 3.10 (7.12)

Basis:

REFUELING PATHWAY: all the cavities, tubes, canals and pools through which irradiated fuel may be moved or stored, but not including the reactor vessel below the flange.

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

CONFINEMENT BOUNDARY: The irradiated fuel dry storage cask barrier(s) between areas containing radioactive substances and the environment.

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

Basis (cont):

This IC applies to irradiated fuel that is licensed for dry storage up to the point that the loaded storage cask is sealed. Once sealed, damage to a loaded cask causing loss of the CONFINEMENT BOUNDARY is classified in accordance with IC E-HU1.

EAL #1 Basis

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

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

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

EAL #2 Basis

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

EAL #3 Basis:

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

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

RECOGNITION CATEGORY

ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RA2 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, AA2
2. ON-124, Fuel Floor and Fuel Handling Problems
3. P-S-43, Radiation Monitoring System
4. ARC 003-00C214 B-4, Refueling Floor Area Hi Radiation
5. ARC 20C075 C-1, Fuel Storage Pool Hi Radiation
6. Peach Bottom ECR titled "Fukushima Modification – U3 Spent Fuel Pool Level Instruments", Doc- 13-00508, Sheet A1893550, Dated 3/26/15, Rev 00, Attachment 1 Section 3.19

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RU2

Initiating Condition:

UNPLANNED loss of water level above irradiated fuel.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

1. a. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by **ANY** of the following:

   - Refueling Cavity water level **< 458 inches** on Shutdown/Refuel Range indicator PR/FR-2(3)-06-097.

     OR

   - Spent Fuel Pool level **< 232 feet 3 inches** plant elevation.

     OR

   - Indication or report of a drop in water level in the REFUELING PATHWAY.

   AND

   b. UNPLANNED Area Radiation Monitor reading rise on one or more radiation monitors in Table R2.

Table R2 Refuel Floor ARM's
• Steam Separator Pool, 234 ELEV, 3.7 (7.9) • Refuel Slot, 234 ELEV, 3.8 (7.10) • Fuel Pool, 234 ELEV, 3.9 (7.11) • Refueling Bridge, 234 ELEV, 3.10 (7.12)

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RU2 (cont)

Basis:

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

REFUELING PATHWAY: all the cavities, tubes, canals and pools through which irradiated fuel may be moved or stored, but not including the reactor vessel below the flange.

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

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

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

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

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

Basis Reference(s):

1. NEI 99-01 Rev 6, AU2
2. Technical Specifications 3.9.6, Reactor Pressure Vessel (RPV) Water Level
3. ON-124, Fuel Floor and Fuel Handling Problems
4. P-S-43, Radiation Monitoring System
5. ARC 003-00C214 B-4, Refueling Floor Area Hi Radiation
6. ARC 20C075 C-1, Fuel Storage Pool Hi Radiation
7. GP-6, Refueling Operations

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RA3

Initiating Condition:

Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

- If the equipment in the room or area listed in Table R4 was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted.

1. Dose rate **> 15 mR/hr** in **ANY** of the following Table R3 areas:

Table R3 Areas Requiring Continuous Occupancy
• Main Control Room • Central Alarm Station – (by survey)

OR

2. UNPLANNED event results in radiation levels that prohibit or significantly impede access to **ANY** of the following Table R4 plant rooms or areas:

Table R4 Areas with Entry Related Mode Applicability	
Area of concern	**Entry Related Mode Applicability**
Reactor Building 135' all areas	Modes 3, 4, and 5

Basis:

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

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

Assuming all plant equipment is operating as designed, normal operation is capable from the Main Control Room (MCR). The plant is also able to transition into a hot shutdown condition from the MCR, therefore Table R4 is a list of plant rooms or areas with entry-related mode applicability that contain equipment which require a manual/local action necessary to transition the plant from normal plant operation to cooldown and shutdown as specified in normal operating procedures (establish shutdown cooling), where if this action is not completed the plant would not be able to attain and maintain cold shutdown.

This Table does not include rooms or areas for which entry is required solely to perform actions of an administrative or record keeping nature (e.g., normal rounds or routine inspections).

Rooms and areas listed in EAL #1 do not need to be included in EAL #2, including the Control Room.

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

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

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

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RA3 (cont)

Basis (cont):

- The increased radiation levels are a result of a planned activity that includes compensatory measures which address the temporary inaccessibility of a room or area (e.g., radiography, spent filter or resin transfer, etc.).
- The action for which room/area entry is required is of an administrative or record keeping nature (e.g., normal rounds or routine inspections).
- The access control measures are of a conservative or precautionary nature, and would not actually prevent or impede a required action.

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

Basis Reference(s):

1. NEI 99-01 Rev 6, AA3
2. FSAR Section describing Class I structures
3. Appendix R Analysis defining Safe Shutdown Area
4. P-S-43, Radiation Monitoring System
5. T-300, Fire Guides
6. SO 10.1.B-2(3), "Residual Heat Removal System Shutdown Cooling Mode Manual Start"

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

RU3

Initiating Condition:

Reactor coolant activity greater than Technical Specification allowable limits.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

1. Air Ejector discharge radiation monitor RIS-2(3)-17-150 A/B **Hi-Hi** alarm.

   OR

2. Specific coolant activity **> 4.0 uCi/gm** Dose equivalent I-131.

Basis:

This IC addresses a reactor coolant activity value that exceeds an allowable limit specified in Technical Specifications. This condition is a precursor to a more significant event and represents a potential degradation of the level of safety of the plant.

Conditions that cause the specified monitor to alarm that are not related to fuel clad degradation should not result in the declaration of an Unusual Event.

This EAL addresses site-specific radiation monitor readings that provide indication of a degradation of fuel clad integrity.

Escalation of the emergency classification level would be via ICs FA1 or the Recognition Category R ICs.

Basis Reference(s):

1. NEI 99-01 Rev 6, SU3
2. Technical Specifications 3.4.6, RCS Specific Activity
3. Technical Specifications 3.7.5, Main Condenser Offgas
4. DBD P-S-30, Offgas System
5. ARC 218 20C210 E-1, Air Ejector Discharge Radiation High-High

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FG1

Initiating Condition:

Loss of ANY Two Barriers AND Loss or Potential Loss of the third barrier.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Refer to Fission Product Barrier Loss and Potential Loss threshold values to determine barrier status.

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.
At the General Emergency classification level each barrier is weighted equally.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FS1

Initiating Condition:

Loss or Potential Loss of ANY two barriers.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Refer to Fission Product Barrier Loss and Potential Loss threshold values to determine barrier status.

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.
At the Site Area Emergency classification level, each barrier is weighted equally.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FA1

Initiating Condition:

ANY Loss or ANY Potential Loss of either Fuel Clad or RCS.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Refer to Fission Product Barrier Loss and Potential Loss threshold values to determine barrier status.

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.
At the Alert classification level, Fuel Cladding and RCS barriers are weighted more heavily than the Containment barrier. Unlike the Containment barrier, loss or potential loss of either the Fuel Cladding or RCS barrier may result in the relocation of radioactive materials or degradation of core cooling capability. Note that the loss or potential loss of Containment barrier in combination with loss or potential loss of either Fuel Cladding or RCS barrier results in declaration of a Site Area Emergency under EAL FS1.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FC1

Initiating Condition:

RCS Activity

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

Coolant activity **> 300 uCi/gm** Dose Equivalent I-131.

Basis:

This threshold indicates that RCS radioactivity concentration is greater than 300 μCi/gm dose equivalent I-131. Reactor coolant activity above this level is greater than that expected for iodine spikes and corresponds to an approximate range of 2% to 5% fuel clad damage. Since this condition indicates that a significant amount of fuel clad damage has occurred, it represents a loss of the Fuel Clad Barrier.

It is recognized that sample collection and analysis of reactor coolant with highly elevated activity levels could require several hours to complete. Nonetheless, a sample-related threshold is included as a backup to other indications.

There is no Potential Loss threshold associated with RCS Activity.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FC2

Initiating Condition:

RPV Water Level

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. Plant conditions indicate Primary Containment flooding is required.

POTENTIAL LOSS

2. RPV water level **cannot** be restored and maintained **> -172 inches** (TAF).

   OR

3. RPV water level **cannot** be determined.

Basis:

Loss Threshold #1 Basis

The Loss threshold represents the EOP requirement for primary containment flooding. This is identified in the BWROG EOPs/SAMPs when the phrase, "Primary Containment Flooding Is Required," appears. Since a site-specific RPV water level is not specified here, the Loss threshold phrase, "Primary containment flooding required," also accommodates the EOP need to flood the primary containment when RPV water level cannot be determined and core damage due to inadequate core cooling is believed to be occurring.

Potential Loss Threshold #2 and #3 Basis

This water level corresponds to the top of the active fuel and is used in the EOPs to indicate a challenge to core cooling.

The RPV water level threshold is the same as RCS Barrier RC2 Loss threshold. Thus, this threshold indicates a Potential Loss of the Fuel Clad barrier and a Loss of the RCS barrier that appropriately escalates the emergency classification level to a Site Area Emergency.

This threshold is considered to be exceeded when, as specified in the site-specific EOPs, RPV water level cannot be restored and maintained above the specified level following depressurization of the RPV (either manually, automatically or by failure of the RCS barrier) or when procedural guidance or a lack of low pressure RPV injection sources preclude Emergency RPV depressurization. EOPs allow the operator a wide choice of RPV injection sources to consider when restoring RPV water level to within prescribed limits. EOPs also specify depressurization of the RPV in order to facilitate

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FC2 (cont)

Basis (cont):

RPV water level control with low-pressure injection sources. In some events, elevated RPV pressure may prevent restoration of RPV water level until pressure drops below the shutoff heads of available injection sources. Therefore, this Fuel Clad barrier Potential Loss is met only after either: 1) the RPV has been depressurized, or required emergency RPV depressurization has been attempted, giving the operator an opportunity to assess the capability of low-pressure injection sources to restore RPV water level or 2) no low pressure RPV injection systems are available, precluding RPV depressurization in an attempt to minimize loss of RPV inventory.

The term "cannot be restored and maintained above" means the value of RPV water level is not able to be brought above the specified limit (top of active fuel). The determination requires an evaluation of system performance and availability in relation to the RPV water level value and trend. A threshold prescribing declaration when a threshold value *cannot* be restored and maintained above a specified limit does not require immediate action simply because the current value is below the top of active fuel, but does not permit extended operation below the limit; the threshold must be considered reached as soon as it is apparent that the top of active fuel cannot be attained

Entry into the "Steam Cooling" leg of the EOPs would be an example of an inability to "restore and maintain" level above TAF resulting in this threshold being met.

In high-power ATWS/failure to scram events, EOPs may direct the operator to deliberately lower RPV water level in order to reduce reactor power. Although such action is a challenge to core cooling and the Fuel Clad barrier, the immediate need to reduce reactor power is the higher priority. For such events, ICs MA3 or MS3 will dictate the need for emergency classification.

Since the loss of ability to determine if adequate core cooling is being provided presents a significant challenge to the fuel clad barrier, a potential loss of the fuel clad barrier is specified.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. T-BAS INTRO, INTRODUCTION TO TRIPS AND SAMPS – BASES
3. T-101, RPV Control Bases
4. T-111, Level Restoration

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FC5

Initiating Condition:

Primary Containment Radiation

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS
Drywell radiation monitor reading **> 9.55 E+02 R/hr.**

Basis:

The radiation monitor reading corresponds to an instantaneous release of all reactor coolant mass into the primary containment, assuming that reactor coolant activity equals 300 μCi/gm dose equivalent I-131. Reactor coolant activity above this level is greater than that expected for iodine spikes and corresponds to an approximate range of 2% to 5% fuel clad damage. Since this condition indicates that a significant amount of fuel clad damage has occurred, it represents a loss of the Fuel Clad Barrier.

The radiation monitor reading in this threshold is higher than that specified for RCS Barrier RC5 Loss Threshold since it indicates a loss of both the Fuel Clad Barrier and the RCS Barrier. Note that a combination of the two monitor readings appropriately escalates the emergency classification level to a Site Area Emergency.

There is no Fuel Clad Barrier Potential Loss threshold associated with Primary Containment Radiation.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. Core Damage Assessment Methodology
3. ARC-005-00C226D-B-5, Unit 3 Containment Radiation Monitor Hi-Rad
4. DBD P-S-43, Radiation Monitoring System

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FC7

Initiating Condition:

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. Any condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier.

POTENTIAL LOSS

2. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.

Basis:

Loss Threshold #1 Basis

This threshold addresses any other factors that are to be used by the Emergency Director in determining whether the Fuel Clad Barrier is lost.

Potential Loss Threshold #2 Basis

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the Fuel Clad Barrier is potentially lost. The Emergency Director should also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RC2

Initiating Condition:

RPV Water Level

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. RPV water level **cannot** be restored and maintained **> -172 inches** (TAF).

   OR

2. RPV water level **cannot** be determined.

Basis:

This water level corresponds to the Top of Active Fuel (TAF) and is used in the EOPs to indicate challenge to core cooling.

The RPV water level threshold is the same as Fuel Clad Barrier FC2 Potential Loss threshold. Thus, this threshold indicates a Loss of the RCS barrier and Potential Loss of the Fuel Clad barrier and that appropriately escalates the emergency classification level to a Site Area Emergency.

This threshold is considered to be exceeded when, as specified in the site-specific EOPs, RPV water level cannot be restored and maintained above the specified level following depressurization of the RPV (either manually, automatically or by failure of the RCS barrier) or when procedural guidance or a lack of low pressure RPV injection sources preclude Emergency RPV depressurization EOPs allow the operator a wide choice of RPV injection sources to consider when restoring RPV water level to within prescribed limits. EOPs also specify depressurization of the RPV in order to facilitate RPV water level control with low-pressure injection sources. In some events, elevated RPV pressure may prevent restoration of RPV water level until pressure drops below the shutoff heads of available injection sources. Therefore, this RCS barrier Loss is met only after either: 1) the RPV has been depressurized, or required emergency RPV depressurization has been attempted, giving the operator an opportunity to assess the capability of low-pressure injection sources to restore RPV water level or 2) no low pressure RPV injection systems are available, precluding RPV depressurization in an attempt to minimize loss of RPV inventory.

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RC2 (cont)

Basis (cont):

The term, "cannot be restored and maintained above," means the value of RPV water level is not able to be brought above the specified limit (top of active fuel). The determination requires an evaluation of system performance and availability in relation to the RPV water level value and trend. A threshold prescribing declaration when a threshold value *cannot* be restored and maintained above a specified limit does not require immediate action simply because the current value is below the top of active fuel, but does not permit extended operation beyond the limit; the threshold must be considered reached as soon as it is apparent that the top of active fuel cannot be attained.

Entry into the "Steam Cooling" leg of the EOP's would be an example of an inability to "restore and maintain" level above TAF resulting in this threshold being met.

In high-power ATWS/failure to scram events, EOPs may direct the operator to deliberately lower RPV water level in order to reduce reactor power. Although such action is a challenge to core cooling and the Fuel Clad barrier, the immediate need to reduce reactor power is the higher priority. For such events, ICs MA3 or MS3 will dictate the need for emergency classification.

There is no RCS Potential Loss threshold associated with RPV Water Level.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. T-BAS INTRO, INTRODUCTION TO TRIPS AND SAMPS – BASES
3. T-101, RPV Control Bases
4. T-111, Level Restoration

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RC3

Initiating Condition:

Primary Containment Pressure

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. Drywell pressure **>2.0 psig.**
   AND
2. Drywell pressure rise is due to RCS leakage

Basis:

The > 2.0 psig primary containment pressure is the Drywell high pressure setpoint which indicates a LOCA by automatically initiating ECCS.

The second threshold condition focuses the fission product barrier loss threshold on a failure of the RCS instead of the non-LOCA malfunctions that may adversely affect primary containment pressure. Pressures of this magnitude can be caused by non-LOCA events such as a loss of Drywell cooling or inability to control primary containment vent/purge.

There is no Potential Loss threshold associated with Primary Containment Pressure.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. T-102, Primary Containment Control-Bases
3. T-101, RPV Control

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RC4

Initiating Condition:

RCS Leak Rate

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. UNISOLABLE Main Steam Line (MSL), HPCI, Feedwater, RWCU, or RCIC line break.
   OR
2. Emergency RPV Depressurization is required.

POTENTIAL LOSS

3. UNISOLABLE primary system leakage that results in **EITHER** of the following:
   a. Secondary Containment area temperature **> T-103 Alarm Setpoint.**
      OR
   b. Secondary Containment radiation level **> T-103 Alarm Setpoint.**

Basis:

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

Failure to isolate the leak, within 15 minutes or if known that the leak cannot be isolated within 15 minutes, from the start of the leak requires immediate classification. Classification of a system break over system leakage is based on information available to the Control Room from the event. Indications that should be considered are:

- Reports describing magnitude of steam or water release.
- Use of system high flow alarms / indications, if available,
- Significant changes in makeup requirements,
- Abnormal reactor water level changes in response to the event.

The use of the above indications provides the Control Room the bases to determine that the on going event is more significant than the indications that would be expected from system leakage and therefore should be considered a system break.

Loss Threshold #1 Basis

Large high-energy lines that rupture outside primary containment can discharge significant amounts of inventory and jeopardize the pressure-retaining capability of the RCS until they are isolated. If it is determined that the ruptured line cannot be promptly isolated, the RCS barrier Loss threshold is met.

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RC4 (cont)

Basis (cont):

Loss Threshold #2 Basis

Emergency RPV Depressurization in accordance with the EOPs is indicative of a loss of the RCS barrier. If Emergency RPV Depressurization is performed, the plant operators are directed to open safety relief valves (SRVs) and keep them open. Even though the RCS is being vented into the torus, a Loss of the RCS barrier exists due to the diminished effectiveness of the RCS to retain fission products within its boundary.

Potential Loss Threshold #3 Basis

Potential loss of RCS based on primary system leakage outside the primary containment is determined from EOP temperature or radiation Max Normal Operating values in areas such as main steam line tunnel, RCIC, HPCI, etc., which indicate a direct path from the RCS to areas outside primary containment.

A Max Normal Operating value is the highest value of the identified parameter expected to occur during normal plant operating conditions with all directly associated support and control systems functioning properly.

The indicators reaching the threshold barriers and confirmed to be caused by RCS leakage from a primary system warrant an Alert classification. A primary system is defined to be the pipes, valves, and other equipment which connect directly to the RPV such that a reduction in RPV pressure will effect a decrease in the steam or water being discharged through an unisolated break in the system.

In general, multiple indications should be used to determine if a primary system is discharging outside Primary Containment. For example, a high area radiation condition does not necessarily indicate that a primary system is discharging into the Reactor Building since this may be caused by radiation shine from nearby steam lines or the movement of radioactive materials. Conversely, a high area radiation condition in conjunction with other indications (e.g. room flooding, high area temperatures, reports of steam in the Reactor Building, an unexpected rise in Feedwater flowrate, or unexpected Main Turbine Control Valve closure) may indicate that a primary system is discharging into the Reactor Building.

An UNISOLABLE leak which is indicated by Max Normal Operating values escalates to a Site Area Emergency when combined with Containment Barrier CT6 Loss Threshold #1 (after a containment isolation) and a General Emergency when the Fuel Clad Barrier criteria is also exceeded.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. T-103, Secondary Containment Control

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RC5

Initiating Condition:

Primary Containment radiation

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS
Drywell radiation monitor reading **> 100R/hr.**

Basis:

The radiation monitor reading corresponds to an instantaneous release of all reactor coolant mass into the primary containment, assuming that reactor coolant activity equals Technical Specification allowable limits. This value is lower than that specified for Fuel Clad Barrier FC5 Loss Threshold since it indicates a loss of the RCS Barrier only.

There is no RCS Potential Loss threshold associated with Primary Containment Radiation.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. EP-EAL-0611, Criteria for Choosing Containment Radiation Monitor Reading Indicative of Loss of RCS Barrier

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

RC7

Initiating Condition:

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. Any condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.

POTENTIAL LOSS

2. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.

Basis:

Loss Threshold #1 Basis

This threshold addresses any other factors that are to be used by the Emergency Director in determining whether the RCS Barrier is lost.

Potential Loss Threshold #2 Basis

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the RCS Barrier is potentially lost. The Emergency Director should also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT2

Initiating Condition:

RPV Water Level

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

POTENTIAL LOSS
Plant conditions indicate Primary Containment flooding is required.

Basis:

The Potential Loss threshold is identical to the Fuel Clad Barrier FC2 Loss threshold RPV Water Level. The Potential Loss requirement for Primary Containment Flooding indicates adequate core cooling cannot be restored and maintained and that core damage is possible. BWR EOPs/SAMPs specify the conditions that require primary containment flooding. When primary containment flooding is required, the EOPs are exited and SAMPs are entered. Entry into SAMPs is a logical escalation in response to the inability to restore and maintain adequate core cooling.

PRA studies indicate that the condition of this Potential Loss threshold could be a core melt sequence which, if not corrected, could lead to RPV failure and increased potential for primary containment failure. In conjunction with the RPV water level Loss thresholds in the Fuel Clad and RCS barrier columns, this threshold results in the declaration of a General Emergency.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. T-111, Level Restoration (LR)- Bases
3. T-116, RPV Flooding - Bases
4. T-117, Level/Power Control – Bases
5. TRIP/SAMP Curves, Tables, And Limits – Bases
6. T-BAS (INTRO), Introduction To Trips And Samps - Bases

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT3

Initiating Condition:

Primary Containment Conditions

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. UNPLANNED rapid drop in Drywell pressure following primary containment pressure rise.
   OR
2. Drywell pressure response **not** consistent with LOCA conditions.

POTENTIAL LOSS

3. Drywell pressure **> 56 psig** and rising.
   OR
4. a. Drywell or Torus Hydrogen concentration **> 6%.**
   AND
   b. Drywell or Torus Oxygen concentration **> 5%.**
   OR
5. Heat Capacity Limit (T-102 Curve T/T-1 or T/T-2) exceeded.

Basis:

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

Loss Threshold #1 and #2 Basis

Rapid UNPLANNED loss of primary containment pressure (i.e., not attributable to Drywell spray or condensation effects) following an initial pressure rise indicates a loss of primary containment integrity. Primary containment pressure should rise as a result of mass and energy release into the primary containment from a LOCA. Thus, primary containment pressure not increasing under these conditions indicates a loss of primary containment integrity.

These thresholds rely on operator recognition of an unexpected response for the condition and therefore a specific value is not assigned. The unexpected (UNPLANNED) response is important because it is the indicator for a containment bypass condition. A pressure suppression bypass path would **not** be an indication of a containment breach.

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT3 (cont)

Basis (cont):

Potential Loss Threshold #3 Basis

The threshold pressure is the primary containment internal design pressure. Structural acceptance testing demonstrates the capability of the primary containment to resist pressures greater than the internal design pressure. A pressure of this magnitude is greater than those expected to result from any design basis accident and, thus, represent a Potential Loss of the Containment barrier.

Potential Loss Threshold #4 Basis

If hydrogen concentration reaches or exceeds the lower flammability limit, as defined in plant EOPs, in an oxygen rich environment, a potentially explosive mixture exists. If the combustible mixture ignites inside the primary containment, loss of the Containment barrier could occur.

Potential Loss Threshold #5 Basis

The HCTL is a function of RPV pressure, torus temperature and torus water level. It is utilized to preclude failure of the containment and equipment in the containment necessary for the safe shutdown of the plant and therefore, the inability to maintain plant parameters below the limit constitutes a potential loss of containment.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. T-BAS INTRO, INTRODUCTION TO TRIPS AND SAMPS – BASES
3. UFSAR Section 5.2.4, Primary Containment Safety Evaluation
4. T-102 Primary Containment Control-Bases
5. DBD P-T-12, Design Basis Accidents, Transients and Events
6. DBD P-T-02, Containment, Section 3.2.14

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT5

Initiating Condition:

Primary Containment Radiation

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

POTENTIAL LOSS

Drywell radiation monitor reading **> 2.20 E+03 R/hr.**

Basis:

There is no Loss threshold associated with Primary Containment Radiation.

The radiation monitor reading corresponds to an instantaneous release of all reactor coolant mass into the primary containment, assuming that 20% of the fuel cladding has failed. This level of fuel clad failure is well above that used to determine the analogous Fuel Clad Barrier Loss and RCS Barrier Loss thresholds.

NUREG-1228, *Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents*, indicates the fuel clad failure must be greater than approximately 20% in order for there to be a major release of radioactivity requiring offsite protective actions. For this condition to exist there must already have been a loss of the RCS Barrier and the Fuel Clad Barrier. It is therefore prudent to treat this condition as a potential loss of containment which would then escalate the emergency classification level to a General Emergency.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. Core Damage Assessment Methodology
3. ARC-005-00C226D-B-5 Unit 3 Containment Radiation Monitor Hi-Rad
4. DBD P-S-43, Radiation Monitoring System

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT6

Initiating Condition:

Primary Containment Isolation Failure

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. UNISOLABLE direct downstream pathway to the environment exists after primary containment isolation signal.

   OR

2. Intentional Primary Containment venting/purging per EOPs or SAMPs due to accident conditions.

   OR

3. UNISOLABLE primary system leakage that results in **EITHER** of the following:

   a. Secondary Containment area temperature **> T-103 Action Level.**

   OR

   b. Secondary Containment area radiation level **> T-103 Action Level.**

Basis:

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

Failure to isolate the leak, within 15 minutes or if known that the leak cannot be isolated within 15 minutes, from the start of the leak requires immediate classification.

These thresholds address incomplete containment isolation that allows an UNISOLABLE direct release to the environment.

Loss Threshold #1 Basis

The use of the modifier "direct" in defining the release path discriminates against release paths through interfacing liquid systems or minor release pathways, such as instrument lines, not protected by the Primary Containment Isolation System (PCIS). Leakage into a closed system is to be considered only if the closed system is breached and thereby creates a significant pathway to the environment. Examples include unisolable Main Steamline, HPCI or RCIC steamline breaks, unisolable RWCU system breaks, and unisolable containment atmosphere vent paths.

Examples of "downstream pathway to the environment" could be through the Turbine/Condenser, or direct release to the Turbine or Reactor Building.

The existence of a filter is not considered in the threshold assessment. Filters do not remove fission product noble gases. In addition, a filter could become ineffective due to

Basis (cont):

iodine and/or particulate loading beyond design limits (i.e., retention ability has been exceeded) or water saturation from steam/high humidity in the release stream.

Following the leakage of RCS mass into primary containment and a rise in primary containment pressure, there may be minor radiological releases associated with allowable primary containment leakage through various penetrations or system components. Minor releases may also occur if a primary containment isolation valve(s) fails to close but the primary containment atmosphere escapes to an enclosed system. These releases do not constitute a loss or potential loss of primary containment but should be evaluated using the Recognition Category R ICs.

Loss Threshold #2 Basis

EOPs may direct primary containment isolation valve logic(s) to be intentionally bypassed, even if offsite radioactivity release rate limits will be exceeded. Under these conditions with a valid primary containment isolation signal, the containment should also be considered lost if primary containment venting is actually performed.

Intentional venting of primary containment for primary containment pressure or combustible gas control to the secondary containment and/or the environment is a Loss of the Containment. Venting for primary containment pressure control when not in an accident situation (e.g., to control pressure below the Drywell high pressure scram setpoint) does not meet the threshold condition.

Loss Threshold #3 Basis

The Max Safe Operating Temperature and the Max Safe Operating Radiation Level are each the highest value of these parameters at which neither: (1) equipment necessary for the safe shutdown of the plant will fail, nor (2) personnel access necessary for the safe shutdown of the plant will be precluded. EOPs utilize these temperatures and radiation levels to establish conditions under which RPV depressurization is required.

The temperatures and radiation levels should be confirmed to be caused by RCS leakage from a primary system. A primary system is defined to be the pipes, valves, and other equipment which connect directly to the RPV such that a reduction in RPV pressure will effect a decrease in the steam or water being discharged through an unisolated break in the system.

In general, multiple indications should be used to determine if a primary system is discharging outside Primary Containment. For example, a high area radiation condition does not necessarily indicate that a primary system is discharging into the Reactor Building since this may be caused by radiation shine from nearby steam lines or the movement of radioactive materials. Conversely, a high area radiation condition in conjunction with other indications (e.g. room flooding, high area temperatures, reports of steam in the Reactor Building, an unexpected rise in Feedwater flowrate, or unexpected Main Turbine Control Valve closure) may indicate that a primary system is discharging into the Reactor Building.

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT6 (cont)

Basis (cont):

In combination with RCS Barrier RC4 Potential Loss Threshold #3 this threshold would result in a Site Area Emergency.

There is no Potential Loss threshold associated with Primary Containment Isolation Failure.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2
2. T-103 Secondary Containment Control
3. T-102 Primary Containment Control
4. T-200-3 Primary Containment Venting

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT7

Initiating Condition:

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. Any condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.

POTENTIAL LOSS

2. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.

Basis:

Loss Threshold #1 Basis

This threshold addresses any other factors that are to be used by the Emergency Director in determining whether the Containment Barrier is lost.

Potential Loss Threshold #2 Basis

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the Containment Barrier is potentially lost. The Emergency Director should also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-2

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MG1

Initiating Condition:

Prolonged loss of all Off-site and all On-Site AC power to emergency buses.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1 Loss of **ALL** offsite AC power to unit 4 KV Safeguards Buses.

AND

2. Failure of E1, E2, E3, and E4 Emergency Diesel Generators to supply power to unit 4KV Safeguards Buses.

AND

3. **EITHER** of the following:

   a. Restoration of at least one unit 4KV safeguards Bus in **< 2 hours is <u>not</u>** likely.

   OR

   b. RPV water level **<u>cannot</u>** be restored and maintained **> -195 inches**.

Basis:

<u>SAFETY SYSTEM</u>: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

This IC addresses a prolonged loss of all power sources to AC emergency buses. A loss of all AC power compromises the performance of all SAFETY SYSTEMS requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink. A prolonged loss of these buses will lead to a loss of one or more fission product barriers. In addition, fission product barrier monitoring capabilities may be degraded under these conditions.

The EAL should require declaration of a General Emergency prior to meeting the thresholds for IC FG1. This will allow additional time for implementation of offsite protective actions.

Escalation of the emergency classification from Site Area Emergency will occur if it is projected that power cannot be restored to at least one AC emergency bus by the end of the analyzed station blackout coping period. Beyond this time, plant responses and

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MG1 (cont)

Basis (cont):

event trajectory are subject to greater uncertainty, and there is an increased likelihood of challenges to multiple fission product barriers.

The estimate for restoring at least one emergency bus should be based on a realistic appraisal of the situation. Mitigation actions with a low probability of success should not be used as a basis for delaying a classification upgrade. The goal is to maximize the time available to prepare for, and implement, protective actions for the public.

The EAL will also require a General Emergency declaration if the loss of AC power results in parameters that indicate an inability to adequately remove decay heat from the core.

Basis Reference(s):

1. NEI 99-01 Rev 6, SG1
2. UFSAR Section 8.4, Auxiliary Power Systems
3. UFSAR Figure 8.3.1, Transmission System
4. DBD P-S-05, 4KV System
5. T-101 RPV Control
6. SE-11, LOSS OF OFF-SITE POWER - BASES

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MS1

Initiating Condition:

Loss of all offsite and all onsite AC power to emergency buses for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. Loss of **ALL** offsite AC Power to unit 4KV Safeguards Buses.

   AND

2. Failure of E1, E2, E3, and E4 Emergency Diesel Generators to supply power to unit 4KV Safeguards Buses.

   AND

3. Failure to restore power to at least one unit 4KV Safeguards bus in **< 15 minutes** from the time of loss of both offsite and onsite AC power.

Basis:

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

This IC addresses a total loss of AC power that compromises the performance of all SAFETY SYSTEMS requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink. In addition, fission product barrier monitoring capabilities may be degraded under these conditions. This IC represents a condition that involves actual or likely major failures of plant functions needed for the protection of the public.

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

Escalation of the emergency classification level would be via ICs RG1, FG1, MG1, or MG2.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MS1 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, SS1
2. UFSAR Section 8.4, Auxiliary Power Systems
3. UFSAR Figure 8.3.1, Transmission System
4. DBD P-S-05, 4KV System
5. SE-11 LOSS OF OFF-SITE POWER - BASES

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MA1

Initiating Condition:

Loss of all but one AC power source to emergency buses for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. AC power capability to unit 4KV Safeguards Buses reduced to only one of the following power sources for **≥ 15 minutes.**
   - 2 Emergency Auxiliary Transformer (0AX04)
   - 3 Emergency Auxiliary Transformer (0BX04)
   - E1 Diesel Generator
   - E2 Diesel Generator
   - E3 Diesel Generator
   - E4 Diesel Generator

   AND
2. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMS.

Basis:

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

This IC describes a significant degradation of offsite and onsite AC power sources such that any additional single failure would result in a loss of all AC power to SAFETY SYSTEMS. In this condition, the sole AC power source may be powering one, or more than one, train of safety-related equipment. This IC provides an escalation path from IC MU1.

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

- A loss of all offsite power with a concurrent failure of all but one emergency power source (e.g., an onsite diesel generator).

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MA1 (cont)

Basis (cont):

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

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

Escalation of the emergency classification level would be via IC MS1.

Basis Reference(s):

1. NEI 99-01 Rev 6, SA1
2. UFSAR Section 8.4, Auxiliary Power Systems
3. UFSAR Figure 8.3.1, Transmission System
4. DBD P-S-05, 4KV System
5. DBD P-T-13, Station Blackout
6. SE-11 LOSS OF OFF-SITE POWER - BASES

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU1

Initiating Condition:

Loss of all offsite AC power capability to emergency buses for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Loss of **ALL** offsite AC power capability to unit 4KV Safeguards Buses for **≥15 minutes**.

Basis:

This IC addresses a prolonged loss of offsite power. The loss of offsite power sources renders the plant more vulnerable to a complete loss of power to AC emergency buses. This condition represents a potential reduction in the level of safety of the plant.

For emergency classification purposes, "capability" means that an offsite AC power source(s) is available to the emergency buses, whether or not the buses are powered from it.

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

Escalation of the emergency classification level would be via IC MA1.

Basis Reference(s):

1. NEI 99-01 Rev 6, SU1
2. UFSAR Section 8.4, Auxiliary Power Systems
3. UFSAR Figure 8.3.1, Transmission System
4. DBD P-S-05, 4KV System
5. DBD P-T-13, Station Blackout
6. SE-11 LOSS OF OFF-SITE POWER - BASES

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MG2

Initiating Condition:

Loss of all AC and Vital DC power sources for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. Loss of **ALL** offsite AC power to unit 4KV safeguards Buses.

   AND

2. Failure of E1, E2, E3, and E4 Emergency Diesel Generators to supply power to unit 4KV Safeguards Buses.

   AND

3. Voltage is **< 107.5 VDC** on unit 125 VDC battery buses 2(3)0D021, 2(3)0D022, 2(3)0D023, and 2(3)0D024.

   AND

4. **ALL** AC and Vital DC power sources have been lost for **≥ 15 minutes.**

Basis:

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

This IC addresses a concurrent and prolonged loss of both AC and Vital DC power. A loss of all AC power compromises the performance of all SAFETY SYSTEMS requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink. A loss of Vital DC power compromises the ability to monitor and control SAFETY SYSTEMS. A sustained loss of both AC and DC power will lead to multiple challenges to fission product barriers.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses. The 15-minute emergency declaration clock begins at the point when all EAL conditions are met.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MG2 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, SG8
2. UFSAR Section 8.4, Auxiliary Power Systems
3. UFSAR Figure 8.3.1, Transmission System
4. DBD P-S-05, 4KV System
5. DBD P-S-01A, 125/250 Vdc Station Batteries Including 125 Vdc Batteries & Chargers, Table T3.2-1, MCCs, and DC Distribution
6. SE-13 LOSS OF A 125 OR 250 VDC SAFETY RELATED BUS
7. ARC-220-20C209R H-3, 2B DC Power Panel Lo Voltage
8. SE-11 LOSS OF OFF-SITE POWER - BASES

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MS2

Initiating Condition:

Loss of all vital DC power for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Voltage is **<107.5 VDC** on 125 VDC battery buses 2(3)0D021, 2(3)0D022, 2(3)0D023, and 2(3)0D024 for **≥15 minutes**.

Basis:

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

This IC addresses a loss of Vital DC power which compromises the ability to monitor and control SAFETY SYSTEMS. In modes above Cold Shutdown, this condition involves a major failure of plant functions needed for the protection of the public.

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

Escalation of the emergency classification level would be via ICs RG1, FG1 or MG2.

Basis Reference(s):

1. NEI 99-01 Rev 6, SS8
2. DBD P-S-01A, 125/250 Vdc Station Batteries Including 125 Vdc Batteries & Chargers, Table T3.2-1, MCCs, and DC Distribution
3. SE-13, LOSS OF A 125 OR 250 VDC SAFETY RELATED BUS
4. ARC-220-20C209R H-3, 2B DC Power Panel Lo Voltage

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MS3

Initiating Condition:

Inability to shutdown the reactor causing a challenge to RPV water level or RCS heat removal.

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

1. Automatic scram did **not** shutdown the reactor as indicated by Reactor Power **> 4%.**

   AND

2. **ALL** manual / ARI actions to shutdown the reactor have been unsuccessful as indicated by Reactor Power **> 4%.**

   AND

3. **EITHER** of the following conditions exist:
   - RPV water level **cannot** be restored and maintained **> -195 inches**

     OR

   - Heat Capacity Limit (T-102 Curve T/T-1 or T/T-2) exceeded.

Basis:

This IC addresses a failure of the RPS to initiate or complete an automatic or manual reactor scram that results in a reactor shutdown, all subsequent operator manual actions, both inside and outside the Control Room including driving in control rods and boron injection, are unsuccessful, and continued power generation is challenging the capability to adequately remove heat from the core and/or the RCS. This condition will lead to fuel damage if additional mitigation actions are unsuccessful and thus warrants the declaration of a Site Area Emergency.

In some instances, the emergency classification resulting from this IC/EAL may be higher than that resulting from an assessment of the plant responses and symptoms against the Recognition Category F ICs/EALs. This is appropriate in that the Recognition Category F ICs/EALs do not address the additional threat posed by a failure to shutdown the reactor. The inclusion of this IC and EAL ensures the timely declaration of a Site Area Emergency in response to prolonged failure to shutdown the reactor.

Escalation of the emergency classification level would be via IC RG1 or FG1.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MS3 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, SS5
2. T-117, Level/Power Control
3. T-101, RPV Control
4. T-102, Primary Containment Control

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MA3

Initiating Condition:

Automatic or manual scram fails to shutdown the reactor, and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor.

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

Note:

- A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.

1. Automatic or manual scram did **not** shutdown the reactor as indicated by Reactor Power **> 4%**.

   AND

2. Manual / ARI actions taken at the Reactor Console are **not** successful in shutting down the reactor as indicated by Reactor Power **> 4%**.

Basis:

This IC addresses a failure of the RPS to initiate or complete an automatic or manual reactor scram that results in a reactor shutdown, and subsequent operator manual actions taken at the reactor consoles to shutdown the reactor are also unsuccessful. This condition represents an actual or potential substantial degradation of the level of safety of the plant. An emergency declaration is required even if the reactor is subsequently shutdown by an action taken away from the reactor consoles since this event entails a significant failure of the RPS.

A manual action at the reactor consoles is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core (e.g., initiating a manual reactor scram. This action does not include manually driving in control rods or implementation of boron injection strategies. If this action(s) is unsuccessful, operators would immediately pursue additional manual actions at locations away from the reactor consoles (e.g., locally opening breakers). Actions taken at back-panels or other locations within the Control Room, or any location outside the Control Room, are not considered to be "at the reactor consoles".

Taking the Reactor Mode Switch to Shutdown is considered to be a manual scram action.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MA3 (cont)

Basis (cont):

The plant response to the failure of an automatic or manual reactor scram will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, other concurrent plant conditions, etc. If the failure to shutdown the reactor is prolonged enough to cause a challenge to the RPV water level or RCS heat removal safety functions, the emergency classification level will escalate to a Site Area Emergency via IC MS3. Depending upon plant responses and symptoms, escalation is also possible via IC FS1. Absent the plant conditions needed to meet either IC MS3 or FS1, an Alert declaration is appropriate for this event.

It is recognized that plant responses or symptoms may also require an Alert declaration in accordance with the Recognition Category F ICs; however, this IC and EAL are included to ensure a timely emergency declaration.

Basis Reference(s):

1. NEI 99-01 Rev 6, SA5
2. T-117, Level/Power Control
3. T-101, RPV Control

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU3

Initiating Condition:

Automatic or manual scram fails to shutdown the reactor.

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

Note:

- A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.

1. a. Automatic scram did **not** shutdown the reactor as indicated by Reactor Power **> 4%**.

   AND

   b. Subsequent manual / ARI action taken at the Reactor Console is successful in shutting down the reactor as indicated by Reactor Power **≤ 4%**.

   OR

2. a. Manual scram did **not** shutdown the reactor as indicated by Reactor Power **> 4%**.

   AND

   b. **EITHER** of the following:

      1. Subsequent manual / ARI action taken at the Reactor Console is successful in shutting down the reactor as indicated by Reactor Power **≤ 4%**.

         OR

      2. Subsequent automatic / ARI scram is successful in shutting down the reactor as indicated by Reactor Power **≤ 4%**.

Basis:

This IC addresses a failure of the RPS to initiate or complete an automatic or manual reactor scram that results in a reactor shutdown, and either a subsequent operator manual action taken at the reactor consoles or an automatic scram is successful in shutting down the reactor. This event is a precursor to a more significant condition and thus represents a potential degradation of the level of safety of the plant.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU3 (cont)

Basis (cont):

EAL #1 Basis

Following the failure on an automatic reactor scram, operators will promptly initiate manual actions at the reactor consoles to shutdown the reactor (e.g., initiate a manual reactor scram). If these manual actions are successful in shutting down the reactor, core heat generation will quickly fall to a level within the capabilities of the plant's decay heat removal systems.

EAL #2 Basis

If an initial manual reactor trip is unsuccessful, operators will promptly take manual action at another location(s) on the reactor consoles to shutdown the reactor (e.g., initiate a manual reactor scram/ARI using a different switch). Depending upon several factors, the initial or subsequent effort to manually scram the reactor, or a concurrent plant condition, may lead to the generation of an automatic reactor scram signal. If a subsequent manual or automatic scram/ARI is successful in shutting down the reactor, core heat generation will quickly fall to a level within the capabilities of the plant's decay heat removal systems.

A manual action at the reactor consoles is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core (e.g., initiating a manual reactor scram). This action does not include manually driving in control rods or implementation of boron injection strategies. Actions taken at back-panels or other locations within the Control Room, or any location outside the Control Room, are not considered to be "at the reactor consoles".

Taking the Reactor Mode Switch to Shutdown is considered to be a manual scram action.

The plant response to the failure of an automatic or manual reactor scram will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, other concurrent plant conditions, etc. If subsequent operator manual actions taken at the reactor consoles are also unsuccessful in shutting down the reactor, then the emergency classification level will escalate to an Alert via IC MA3. Depending upon the plant response, escalation is also possible via IC FA1. Absent the plant conditions needed to meet either IC MA3 or FA1, an Unusual Event declaration is appropriate for this event.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU3 (cont)

Basis (cont):

Should a reactor scram signal be generated as a result of plant work (e.g., RPS setpoint testing), the following classification guidance should be applied.

- If the signal generated as a result of plant work causes a plant transient that creates a real condition that should have included an automatic reactor scram and the RPS fails to automatically shutdown the reactor, then this IC and the EALs are applicable, and should be evaluated.
- If the signal generated as a result of plant work does not cause a plant transient but should have generated an RPS scram signal and the scram failure is determined through other means (e.g., assessment of test results), then this IC and the EALs are not applicable and no classification is warranted.

Basis Reference(s):

1. NEI 99-01 Rev 6, SU5
2. T-117, Level/Power Control

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MA4

Initiating Condition:

UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. UNPLANNED event results in the inability to monitor **ANY** Table M1 parameters from within the Control Room for **≥15 minutes**.

Table M1 – Control Room Parameters
• Reactor Power • RPV Water Level • RPV Pressure • Drywell Pressure • Torus Level • Torus Temperature

AND

2. **ANY** Table M2 transient in progress.

Table M2 – Significant Transients
• Automatic or Manual Runback **>25%** thermal reactor power • Electrical Load Rejection **>25%** full electrical load • Reactor Scram • ECCS Actuation • Thermal Power oscillations **> 10%**

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MA4 (cont)

Basis:

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

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

This IC addresses the difficulty associated with monitoring rapidly changing plant conditions during a transient without the ability to obtain SAFETY SYSTEM parameters from within the Control Room. During this condition, the margin to a potential fission product barrier challenge is reduced. It thus represents a potential substantial degradation in the level of safety of the plant.

As used in this EAL, an "inability to monitor" means that values for one or more of the listed parameters cannot be determined from within the Control Room. This situation would require a loss of all of the Control Room sources for the given parameter(s). For example, the reactor power level cannot be determined from any analog, computer point, digital and recorder source within the Control Room.

An event involving a loss of plant indications, annunciators and/or display systems is evaluated in accordance with 10 CFR 50.72 (and associated guidance in NUREG-1022) to determine if an NRC event report is required. The event would be reported if it significantly impaired the capability to perform emergency assessments. In particular, emergency assessments necessary to implement abnormal operating procedures, emergency operating procedures, and emergency plan implementing procedures addressing emergency classification, accident assessment, or protective action decision-making.

This EAL is focused on a selected subset of plant parameters associated with the key safety functions of reactivity control, RPV water level and RCS heat removal. The loss of the ability to determine one or more of these parameters from within the Control Room is considered to be more significant than simply a reportable condition. In addition, if all indication sources for one or more of the listed parameters are lost, then the ability to determine the values of other SAFETY SYSTEM parameters may be impacted as well. For example, if the value for RPV water level cannot be determined from the indications and recorders on a main control board, the SPDS or the plant computer, the availability of other parameter values may be compromised as well.

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

Escalation of the emergency classification level would be via ICs FS1 or IC RS1.

Basis Reference(s):

1. NEI 99-01 Rev 6, SA2

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU4

Initiating Condition:

UNPLANNED loss of Control Room indications for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

UNPLANNED event results in the inability to monitor **ANY** Table M1 parameters from within the Control Room for **≥ 15 minutes.**

Table M1 – Control Room Parameters
• Reactor Power • RPV Water Level • RPV Pressure • Drywell Pressure • Torus Level • Torus Temperature

Basis:

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

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

This IC addresses the difficulty associated with monitoring normal plant conditions without the ability to obtain SAFETY SYSTEM parameters from within the Control Room. This condition is a precursor to a more significant event and represents a potential degradation in the level of safety of the plant.

As used in this EAL, an "inability to monitor" means that values for one or more of the listed parameters cannot be determined from within the Control Room. This situation would require a loss of all of the Control Room sources for the given parameter(s). For example, the reactor power level cannot be determined from any analog, digital and recorder source within the Control Room.

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU4 (cont)

Basis (cont):

An event involving a loss of plant indications, annunciators and/or display systems is evaluated in accordance with 10 CFR 50.72 (and associated guidance in NUREG-1022) to determine if an NRC event report is required. The event would be reported if it significantly impaired the capability to perform emergency assessments. In particular, emergency assessments necessary to implement abnormal operating procedures, emergency operating procedures, and emergency plan implementing procedures addressing emergency classification, accident assessment, or protective action decision-making.

This EAL is focused on a selected subset of plant parameters associated with the key safety functions of reactivity control, core cooling and RCS heat removal. The loss of the ability to determine one or more of these parameters from within the Control Room is considered to be more significant than simply a reportable condition. In addition, if all indication sources for one or more of the listed parameters are lost, then the ability to determine the values of other SAFETY SYSTEM parameters may be impacted as well. For example, if the value for reactor vessel level cannot be determined from the indications and recorders on a main control board, the SPDS or the plant computer, the availability of other parameter values may be compromised as well.

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

Escalation of the emergency classification level would be via IC MA4.

Basis Reference(s):

1. NEI 99-01 Rev 6, SU2

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MA5

Initiating Condition:

Hazardous event affecting a SAFETY SYSTEM required for the current operating mode.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- If it is determined that the conditions of MA5 are not met then assess the event via HU3, HU4, or HU6.

1. The occurrence of **ANY** of the following hazardous events:
    - Seismic event (earthquake)
    - Internal or external flooding event
    - High winds or tornado strike
    - FIRE
    - EXPLOSION
    - Other events with similar hazard characteristics as determined by the Shift Manager

    AND

2. **EITHER** of the following:
    a. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode.

    OR

    b. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure required by Technical Specifications for the current operating mode.

Basis:

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

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

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MA5 (cont)

Basis (cont):

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

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

This IC addresses a hazardous event that causes damage to a SAFETY SYSTEM, or a structure containing SAFETY SYSTEM components, required for the current operating mode, "required", i.e. required to be operable by Technical Specifications for the current operating mode. This condition significantly reduces the margin to a loss or potential loss of a fission product barrier, and therefore represents an actual or potential substantial degradation of the level of safety of the plant. Manual or automatic electrical isolation of safety equipment due to flooding, in and of itself, does not constitute degraded performance and is classified under HU6.

EAL #2.a Basis

This EAL addresses damage to a SAFETY SYSTEM train that is required to be operable by Technical Specifications for the current operating mode, and is in operation since indications for it will be readily available. The indications of degraded performance should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

EAL #2.b Basis

This EAL addresses damage to a SAFETY SYSTEM component that is required to be operable by Technical Specifications for the current operating mode, and is not in operation or readily apparent through indications alone, as well as damage to a structure containing SAFETY SYSTEM components. Operators will make this determination based on the totality of available event and damage report information. This is intended to be a brief assessment not requiring lengthy analysis or quantification of the damage.

Escalation of the emergency classification level would be via IC FS1 or RS1.

If the EAL conditions of MA5 are not met then assess the event via HU3, HU4, or HU6.

Basis Reference(s):

1. NEI 99-01, Rev 6 SA9
2. SE-5, Earthquake - Bases
3. SE-4, Flood – Bases
4. DBD P-T-09, Internal Hazards

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU6

Initiating Condition:

RCS leakage for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. RCS unidentified or pressure boundary leakage in the Drywell **> 10 gpm** for **≥ 15 minutes.**

   OR

2. RCS identified leakage in the Drywell **>25 gpm** for **≥ 15 minutes.**

   OR

3. Leakage from the RCS to a location outside the Drywell **>25 gpm** for **≥ 15 minutes.**

Basis:

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

Failure to isolate the leak, within 15 minutes or if known that the leak cannot be isolated within 15 minutes, from the start of the leak requires immediate classification.

This IC addresses RCS leakage which may be a precursor to a more significant event. In this case, RCS leakage has been detected and operators, following applicable procedures, have been unable to promptly isolate the leak. This condition is considered to be a potential degradation of the level of safety of the plant.

EAL #1 and EAL #2 Basis

These EALs are focused on a loss of mass from the RCS due to "unidentified leakage", "pressure boundary leakage" or "identified leakage" (as these leakage types are defined in the plant Technical Specifications).

EAL #3 Basis

This EAL addresses a RCS mass loss caused by an UNISOLABLE leak through an interfacing system.

These EALs thus apply to leakage into the containment, a secondary-side system or a location outside of containment.

The leak rate values for each EAL were selected because they are usually observable with normal Control Room indications. Lesser values typically require time-consuming

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU6 (cont)

Basis (cont):

calculations to determine (e.g., a mass balance calculation). EAL #1 uses a lower value that reflects the greater significance of unidentified or pressure boundary leakage.

The release of mass from the RCS due to the as-designed/expected operation of any relief valve does not warrant an emergency classification.

A stuck-open Safety Relief Valve (SRV) or SRV leakage is not considered either identified or unidentified leakage by Technical Specifications and, therefore, is not applicable to this EAL.

The 15-minute threshold duration allows sufficient time for prompt operator actions to isolate the leakage, if possible.

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

Basis Reference(s):

1. NEI 99-01 Rev 6, SU4
2. Technical Specifications 3.4.4, RCS Operational Leakage
3. UFSAR 4.10.3, Nuclear System Leakage Detection and Leakage Rate Limits
4. UFSAR 5.2.5, Primary Containment – Inspection and Testing
5. ST-O-020-560-2/3, Reactor Coolant Leakage Test
6. DBD P-S-34 Radwaste System, 3.3.1.3.1 Drywell Floor Drain Sump Operation
7. DBD P-S-34 Radwaste System, 3.3.1.3.2 Drywell Equipment Drain Sump Operation

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU7

Initiating Condition:

Loss of all On-site or Off-site communications capabilities.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

1. Loss of **ALL** Table M3 **Onsite** communications capability affecting the ability to perform routine operations.

   OR

2. Loss of **ALL** Table M3 **Offsite** communication capability affecting the ability to perform offsite notifications.

   OR

3. Loss of **ALL** Table M3 **NRC** communication capability affecting the ability to perform NRC notifications.

Table M3 – Communications Capability			
System	**Onsite**	**Offsite**	**NRC**
Station Radio System	X		
Plant Public Address (PA)	X		
OMNI System	X	X	
Station Phones	X	X	X
Satellite Phones		X	X
NARS		X	
HPN		X	X
ENS		X	X

Basis:

This IC addresses a significant loss of on-site, offsite, or NRC communications capabilities. While not a direct challenge to plant or personnel safety, this event warrants prompt notifications to Offsite Response Organizations (OROs) and the NRC.

This IC should be assessed only when extraordinary means are being utilized to make communications possible (e.g., use of non-plant, privately owned equipment, relaying of on-site information via individuals or multiple radio transmission points, individuals being sent to offsite locations, etc.).

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS

MU7 (cont)

Basis (cont):

EAL #1Basis

Addresses a total loss of the communications methods used in support of routine plant operations.

EAL #2 Basis

Addresses a total loss of the communications methods used to notify all OROs of an emergency declaration. The OROs referred to here are listed in procedure EP-MA-114-100-F-01, State/Local Event Notification Form.

EAL #3 Basis

Addresses a total loss of the communications methods used to notify the NRC of an emergency declaration.

Basis Reference(s):

1. NEI 99-01 Rev 6, SU6
2. UFSAR Section 10.21, Communication Systems
3. EP-MA-124-1001 Facility Inventories and Equipment Tests
4. NE-CG-400-19 Lighting and Communication Drawings

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA1

Initiating Condition:

Loss of all offsite and all onsite AC power to emergency buses for 15 minutes or longer.

Operating Mode Applicability:

4, 5, D

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. Loss of **ALL** offsite AC power to unit 4KV Safeguards Buses.

   AND

2. Failure of E1, E2, E3, and E4 Emergency Diesel Generators to supply power to unit 4KV Safeguards Buses.

   AND

3. Failure to restore power to at least one unit 4KV Safeguards bus in **< 15 minutes** from the time of loss of both offsite and onsite AC power.

Basis:

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

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

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

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

Escalation of the emergency classification level would be via IC CS6 or RS1.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA1 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, CA2
2. UFSAR Section 8.4, Auxiliary Power Systems
3. UFSAR Figure 8.3.1, Transmission System
4. UFSAR Section 8.5.3, Standby AC Power Supply and Distribution
5. DBD P-S-05, 4KV System
6. DBD P-T-13, Station Blackout
7. SE-11 LOSS OF OFF-SITE POWER - BASES

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU1

Initiating Condition:

Loss of all but one AC power source to emergency buses for 15 minutes or longer.

Operating Mode Applicability:

4, 5, D

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. AC power capability to unit 4KV Safeguards Buses reduced to only one of the following power sources for **≥ 15 minutes.**
   - 2 Emergency Auxiliary Transformer (0AX04)
   - 3 Emergency Auxiliary Transformer (0BX04)
   - E1 Diesel Generator
   - E2 Diesel Generator
   - E3 Diesel Generator
   - E4 Diesel Generator

   AND
2. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMS.

Basis:

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

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

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

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU1 (cont)

Initiating Condition:

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

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

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

The subsequent loss of the remaining single power source would escalate the event to an Alert in accordance with IC CA1.

Basis Reference(s):

1. NEI 99-01 Rev 6 CU2
2. UFSAR Section 8.4, Auxiliary Power Systems
3. UFSAR Figure 8.3.1, Transmission System
4. UFSAR Section 8.5.3, Standby AC Power Supply and Distribution
5. DBD P-S-05, 4KV System
6. DBD P-T-13, Station Blackout
7. SE-11 LOSS OF OFF-SITE POWER - BASES

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA2

Initiating Condition:

Hazardous event affecting SAFETY SYSTEM required for the current operating mode.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- If it is determined that the conditions of CA2 are not met then assess the event via HU3, HU4, or HU6.

1. The occurrence of **ANY** of the following hazardous events:
   - Seismic event (earthquake)
   - Internal or external flooding event
   - High winds or tornado strike
   - FIRE
   - EXPLOSION
   - Other events with similar hazard characteristics as determined by the Shift Manager

   AND

2. **EITHER** of the following:
   a. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode.

   OR

   b. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure required by Technical Specifications for the current operating mode.

Basis:

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

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA2 (cont)

Basis (cont):

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

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

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

This IC addresses a hazardous event that causes damage to a SAFETY SYSTEM, or a structure containing SAFETY SYSTEM components, required for the current operating mode, "required", i.e. required to be operable by Technical Specifications for the current operating mode. This condition significantly reduces the margin to a loss or potential loss of a fission product barrier, and therefore represents an actual or potential substantial degradation of the level of safety of the plant. Manual or automatic electrical isolation of safety equipment due to flooding, in and of itself, does not constitute degraded performance and is classified under HU6.

EAL #2.a Basis

Addresses damage to a SAFETY SYSTEM train that is required to be operable by Technical Specifications for the current operating mode, and is in operation since indications for it will be readily available. The indications of degraded performance should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

EAL #2.b Basis

Addresses damage to a SAFETY SYSTEM component that is required to be operable by Technical Specifications for the current operating mode, and is not in operation or readily apparent through indications alone, or to a structure containing SAFETY SYSTEM components. Operators will make this determination based on the totality of available event and damage report information. This is intended to be a brief assessment not requiring lengthy analysis or quantification of the damage.

Escalation of the emergency classification level would be via IC CS6 or RS1.

If the EAL conditions of CA2 are not met then assess the event via HU3, HU4, or HU6.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA2 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, CA6

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU3

Initiating Condition:

Loss of Vital DC power for 15 minutes or longer.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Voltage is **< 107.5 VDC** on required 125 VDC battery buses 2(3)0D021, 2(3)0D022 , 2(3)0D023 , and 2(3)0D024 for **≥ 15 minutes**.

Basis:

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

This IC addresses a loss of Vital DC power which compromises the ability to monitor and control operable SAFETY SYSTEMS when the plant is in the cold shutdown or refueling mode. In these modes, the core decay heat load has been significantly reduced, and coolant system temperatures and pressures are lower; these conditions rise the time available to restore a vital DC bus to service. Thus, this condition is considered to be a potential degradation of the level of safety of the plant.

As used in this EAL, "required" means the Vital DC buses necessary to support operation of the in-service, or operable, train or trains of SAFETY SYSTEM equipment. For example, if Train A is out-of-service (inoperable) for scheduled outage maintenance work and Train B is in-service (operable), then a loss of Vital DC power affecting Train B would require the declaration of an Unusual Event. A loss of Vital DC power to Train A would not warrant an emergency classification.

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

Depending upon the event, escalation of the emergency classification level would be via IC CA6 or CA5, or an IC in Recognition Category R.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU3 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, CU4
2. DBD P-S-01A, 125/250 Vdc Station Batteries Including 125 Vdc Batteries & Chargers, Table T3.2-1, MCCs, and DC Distribution
3. SE-13, LOSS OF A 125 OR 250 VDC SAFETY RELATED BUS
4. ARC-220-20C209R H-3, 2B DC Power Panel Lo Voltage

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU4

Initiating Condition:

Loss of all onsite or offsite communications capabilities.

Operating Mode Applicability:

4, 5, D

Emergency Action Level (EAL):

1. Loss of **ALL** Table C1 **Onsite** communications capability affecting the ability to perform routine operations.

   OR

2. Loss of **ALL** Table C1 **Offsite** communication capability affecting the ability to perform offsite notifications.

   OR

3. Loss of **ALL** Table C1 **NRC** communication capability affecting the ability to perform NRC notifications.

Table C1 – Communications Capability

System	Onsite	Offsite	NRC
Station Radio System	X		
Plant Public Address (PA)	X		
OMNI System	X	X	
Station Phones	X	X	X
Satellite Phones		X	X
NARS		X	
HPN		X	X
ENS		X	X

Basis:

This IC addresses a significant loss of on-site, offsite, or NRC communications capabilities. While not a direct challenge to plant or personnel safety, this event warrants prompt notifications to Offsite Response Organizations (OROs) and the NRC.

This IC should be assessed only when extraordinary means are being utilized to make communications possible (e.g., use of non-plant, privately owned equipment, relaying of on-site information via individuals or multiple radio transmission points, individuals being sent to offsite locations, etc.).

EAL #1 Basis

Addresses a total loss of the communications methods used in support of routine plant operations.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU4 (cont)

Basis (cont):

EAL #2 Basis

Addresses a total loss of the communications methods used to notify all OROs of an emergency declaration. The OROs referred to here are listed in procedure EP-MA-114-100-F-01, State/Local Event Notification Form.

EAL #3 Basis

Addresses a total loss of the communications methods used to notify the NRC of an emergency declaration.

Basis Reference(s):

1. NEI 99-01 Rev 6, CU5
2. UFSAR Section 10.21, Communication Systems
3. EP-MA-124-1001 Facility Inventories and Equipment Tests
4. NE-CG-400-19 Lighting and Communication Drawings

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA5

Initiating Condition:

Inability to maintain the plant in cold shutdown.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when heat removal function is available does not warrant classification.

1. UNPLANNED rise in RCS temperature **> 212°F** for **> Table C2 duration.**

Table C2 – RCS Heat-up Duration Thresholds		
RCS Status	**Containment Closure Status**	**Heat-up Duration**
Intact	Not Applicable	60 minutes*
Not Intact	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, then EAL #1 is **not** applicable.		

OR

2. UNPLANNED RPV pressure rise **> 10 psig** as a result of temperature rise.

Basis:

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

CONTAINMENT CLOSURE: The procedurally defined conditions or actions taken to secure containment (primary or secondary) and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA5 (cont)

Basis (cont):

RCS is intact when the RCS pressure boundary is in its normal condition for the Cold Shutdown mode of operation (e.g. no freeze seals, or steam line nozzle plugs, etc.).

This IC addresses conditions involving a loss of decay heat removal capability or an addition of heat to the RCS in excess of that which can currently be removed. Either condition represents an actual or potential substantial degradation of the level of safety of the plant.

A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when the heat removal function is available does not warrant a classification.

The RCS Heat-up Duration Thresholds table addresses a rise in RCS temperature when CONTAINMENT CLOSURE is established but the RCS is not intact. The 20-minute criterion was included to allow time for operator action to address the temperature rise.

The RCS Heat-up Duration Thresholds table also addresses a rise in RCS temperature with the RCS intact. The status of CONTAINMENT CLOSURE is not crucial in this condition since the intact RCS is providing a high pressure barrier to a fission product release. The 60-minute time frame should allow sufficient time to address the temperature rise without a substantial degradation in plant safety.

Finally, in the case where there is a rise in RCS temperature, the RCS is not intact , and CONTAINMENT CLOSURE is not established, no heat-up duration is allowed (i.e., 0 minutes). This is because 1) the evaporated reactor coolant may be released directly into the Containment atmosphere and subsequently to the environment, and 2) there is reduced reactor coolant inventory above the top of irradiated fuel.

EAL #2 Basis

Provides a pressure-based indication of RCS heat-up.

Escalation of the emergency classification level would be via IC CS6 or RS1.

Basis Reference(s):

1. NEI 99-01 Rev 6, CA3
2. Technical Specification 3.6.1.1, Primary Containment
3. Technical Specification 3.6.4.1, Secondary Containment
4. DBD P-S-16, REACTOR INSTRUMENTATION SYSTEM
5. DBD P-S-19, RECIRCULATION SYSTEM
6. SE-11, ATTACHMENT C – INSTRUMENT LIST

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU5

Initiating Condition:

UNPLANNED rise in RCS temperature

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when heat removal function is available does not warrant classification.

1. UNPLANNED rise in RCS temperature **> 212°F**.

   OR

2. Loss of the following for **≥ 15 minutes.**
   - **ALL** RCS temperature indications

     AND
   - **ALL** RPV water level indications

Basis:

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

CONTAINMENT CLOSURE: The procedurally defined conditions or actions taken to secure containment (primary or secondary) and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions.

RCS is intact when the RCS pressure boundary is in its normal condition for the Cold Shutdown mode of operation (e.g. no freeze seals, or steam line nozzle plugs, etc.).

This IC addresses an UNPLANNED rise in RCS temperature above the Technical Specification cold shutdown temperature limit, or the inability to determine RCS temperature and level, represents a potential degradation of the level of safety of the plant. If the RCS is not intact and CONTAINMENT CLOSURE is not established during this event, the Emergency Director should also refer to IC CA5.

A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when the heat removal function is available does not warrant a classification.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU5 (cont)

Basis (cont):

EAL #1 involves a loss of decay heat removal capability, or an addition of heat to the RCS in excess of that which can currently be removed, such that reactor coolant temperature cannot be maintained below the cold shutdown temperature limit specified in Technical Specifications. During this condition, there is no immediate threat of fuel damage because the core decay heat load has been reduced since the cessation of power operation.

During an outage, the level in the reactor vessel will normally be maintained above the reactor vessel flange. Refueling evolutions that lower water level below the reactor vessel flange are carefully planned and controlled. A loss of forced decay heat removal at reduced inventory may result in a rapid rise in reactor coolant temperature depending on the time after shutdown.

EAL #2 reflects a condition where there has been a significant loss of instrumentation capability necessary to monitor RCS conditions and operators would be unable to monitor key parameters necessary to assure core decay heat removal. During this condition, there is no immediate threat of fuel damage because the core decay heat load has been reduced since the cessation of power operation.

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

Escalation to Alert would be via IC CA6 based on an inventory loss or IC CA5 based on exceeding plant configuration-specific time criteria.

Basis Reference(s):

1. NEI 99-01 Rev 6, CU3
2. T-102, Primary Containment Control – Bases
3. T-103, Secondary Containment Control – Bases
4. PBAPS 2/3 TRIP/SAMP CURVES, TABLES, & LIMITS – BASES
5. DBD P-S-16, REACTOR INSTRUMENTATION SYSTEM
6. DBD P-S-19, RECIRCULATION SYSTEM

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CG6

Initiating Condition:

Loss of RPV inventory affecting fuel clad integrity with containment challenged.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. a. RPV water level **< -172 inches** (TAF) for **≥ 30 minutes.**

   AND

   b. **ANY** Containment Challenge Indication (Table C4)

OR

2. a. RPV water level **cannot** be monitored for **≥ 30 minutes.**

   AND

   b. Core uncovery is indicated by **ANY** of the following:

   - Table C3 indications of a sufficient magnitude to indicate core uncovery.

     OR

   - **ANY** Table C5 Refuel Floor Area Radiation Monitor **>3 R/hr.**

   AND

   c. **ANY** Containment Challenge Indication (Table C4)

Table C3 Indications of RCS Leakage
• UNPLANNED floor or equipment sump level rise* • UNPLANNED Torus level rise* • UNPLANNED vessel make up rate rise • Observation of leakage or inventory loss
*Rise in level is attributed to a loss of RPV inventory.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CG6 (cont)

Emergency Action Level (EAL) (cont):

Table C4 – Containment Challenge Indications
• Primary Containment Hydrogen Concentration **> 6% and Oxygen > 5%** • UNPLANNED rise in containment pressure • CONTAINMENT CLOSURE **not** established* • Any Secondary Containment radiation monitor **> T-103 Action Level**
* if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncovery time limit, then escalation to a General Emergency is **not** required.

Table C5 Refuel Floor ARM's
• Steam Separator Pool, 234 ELEV, 3.7 (7.9) • Refuel Slot, 234 ELEV, 3.8 (7.10) • Fuel Pool, 234 ELEV, 3.9 (7.11) • Refueling Bridge, 234 ELEV, 3.10 (7.12)

Basis:

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

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

CONTAINMENT CLOSURE: The procedurally defined conditions or actions taken to secure containment (primary or secondary) and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CG6 (cont)

Basis (cont):

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

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

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

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

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

EAL #1 Basis

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

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

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CG6 (cont)

Basis (cont):

These EALs address concerns raised by Generic Letter 88-17, *Loss of Decay Heat Removal*; SECY 91-283, *Evaluation of Shutdown and Low Power Risk Issues*; NUREG-1449, *Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States*; and NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management*.

Basis Reference(s):

1. NEI 99-01 Rev 6, CG1
2. T-101, RPV Control
3. T-102 Primary Containment Control
4. T-103 Secondary Containment Control
5. Technical Specification 3.6.1.1, Primary Containment
6. Technical Specification 3.6.4.1, Secondary Containment
7. UFSAR Table 5.2-1, Primary Containment
8. EP-EAL-0501, Estimation of Radiation Monitor Readings Indicating Core Uncovery During Refuel
9. DBD P-T-02, Containment, Section 3.2.14
10. DBD P-S-20, Neutron Monitoring System

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CS6

Initiating Condition:

Loss of RPV inventory affecting core decay heat removal capability.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. With CONTAINMENT CLOSURE **not** established, RPV water level **< -160 inches.**

   OR

2. With CONTAINMENT CLOSURE established, RPV water level **< - 172 inches** (TAF).

   OR

3. a. RPV water level **cannot** be monitored for **≥ 30 minutes**

   AND

   b. Core uncovery is indicated by **ANY** of the following:

   - Table C3 indications of a sufficient magnitude to indicate core uncovery.

     OR

   - **ANY** Table C5 Refuel Floor Area Radiation Monitor **>3 R/hr.**

Table C3 Indications of RCS Leakage
• UNPLANNED floor or equipment sump level rise* • UNPLANNED Torus level rise* • UNPLANNED vessel make up rate rise • Observation of leakage or inventory loss
*Rise in level is attributed to a loss of RPV inventory.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CS6 (cont)

Emergency Action Level (EAL) (cont):

Table C5 Refuel Floor ARM's
• Steam Separator Pool, 234 ELEV, 3.7 (7.9) • Refuel Slot, 234 ELEV, 3.8 (7.10) • Fuel Pool, 234 ELEV, 3.9 (7.11) • Refueling Bridge, 234 ELEV, 3.10 (7.12)

Basis:

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

CONTAINMENT CLOSURE: The procedurally defined conditions or actions taken to secure containment (primary or secondary) and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions.

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

Following an extended loss of core decay heat removal and inventory makeup, decay heat will cause reactor coolant boiling and a further reduction in reactor vessel level. If RCS/reactor vessel level cannot be restored, fuel damage is probable. Outage/shutdown contingency plans typically provide for re-establishing or verifying CONTAINMENT CLOSURE following a loss of heat removal or RCS inventory control functions. The difference in the specified RCS/reactor vessel levels of EALs #1 and #2 reflect the fact that with CONTAINMENT CLOSURE established, there is a lower probability of a fission product release to the environment.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CS6 (cont)

Basis:

In **EAL** #3.a, the 30-minute criterion is tied to a readily recognizable event start time (i.e., the total loss of ability to monitor level), and allows sufficient time to monitor, assess and correlate reactor and plant conditions to determine if core uncovery has actually occurred (i.e., to account for various accident progression and instrumentation uncertainties). It also allows sufficient time for performance of actions to terminate leakage, recover inventory control/makeup equipment and/or restore level monitoring.

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

These EALs address concerns raised by Generic Letter 88-17, *Loss of Decay Heat Removal*; SECY 91-283, *Evaluation of Shutdown and Low Power Risk Issues*; NUREG-1449, *Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States*; and NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management*.

Escalation of the emergency classification level would be via IC CG6 or RG1.

Basis Reference(s):

1. NEI 99-01 Rev 6, CS1
2. T-101, RPV Control
3. T-102 Primary Containment Control
5. Technical Specification 3.6.1.1, Primary Containment
6. Technical Specification 3.6.4.1, Secondary Containment
7. UFSAR Table 5.2-1, Primary Containment
8. EP-EAL-0501, Estimation of Radiation Monitor Readings Indicating Core Uncovery During Refuel
9. DBD P-T-02, Containment, Section 3.2.14
10. DBD P-S-20, Neutron Monitoring System

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA6

Initiating Condition:

Loss of RPV inventory.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. Loss of RPV inventory as indicated by level **< - 48 inches.**

   OR

2. a. RPV water level **cannot** be monitored for **≥ 15 minutes.**

   AND

   b. Loss of RPV inventory per Table C3 indications.

Table C3 Indications of RCS Leakage
• UNPLANNED floor or equipment sump level rise* • UNPLANNED Torus level rise* • UNPLANNED vessel make up rate rise • Observation of leakage or inventory loss
*Rise in level is attributed to a loss of RPV inventory.

Basis:

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

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

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA6 (cont)

Basis (cont):

EAL #1 Basis

A lowering of water level below -48 inches indicates that operator actions have not been successful in restoring and maintaining RPV water level. The heat-up rate of the coolant will rise as the available water inventory is reduced. A continuing drop in water level will lead to core uncovery.

Although related, EAL #1 is concerned with the loss of RCS inventory and not the potential concurrent effects on systems needed for decay heat removal (e.g., loss of a Residual Heat Removal suction point). A rise in RCS temperature caused by a loss of decay heat removal capability is evaluated under IC CA5.

EAL #2 Basis

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

The 15-minute duration for the loss of level indication was chosen because it is half of the Threshold duration specified in IC CS6

If the RPV water level continues to lower, then escalation to Site Area Emergency would be via IC CS6.

Basis Reference(s):

1. NEI 99-01 Rev 6, CA1
2. Technical Specification 3.4.4, RCS Operational Leakage
3. UFSAR 5.2.5, Primary Containment
4. ST-O-020-560-2/3 REACTOR COOLANT LEAKAGE TEST
5. OT-101 HIGH DRYWELL PRESSURE - PROCEDURE
6. ARC 227-A4 Drywell Hi Pressure Sealed-In
7. ARC 210-A4 Drywell Hi-Lo Pressure
8. DBD P-S-34 RADWASTE SYSTEM, 3.3.1.3.1 Drywell Floor Drain Sump Operation
9. DBD P-S-34 RADWASTE SYSTEM, 3.3.1.3.2 Drywell Equipment Drain Sump Operation
10. T-102, Primary Containment Control

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU6

Initiating Condition:

UNPLANNED loss of RPV inventory for 15 minutes or longer.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. UNPLANNED loss of reactor coolant results in the inability to restore and maintain RPV water level to above the **procedurally established lower limit** for **≥ 15 minutes**.

   OR

2. a. RPV water level **cannot** be monitored

   AND

   b. Loss of RPV inventory per Table C3 indications.

Table C3 Indications of RCS Leakage
• UNPLANNED floor or equipment sump level rise* • UNPLANNED Torus level rise* • UNPLANNED vessel make up rate rise • Observation of leakage or inventory loss
*Rise in level is attributed to a loss of RPV inventory.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU6 (cont)

Basis:

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

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

The procedurally established lower limit is not an operational band established above the procedural limit to allow for operator action prior to exceeding the procedural limit, but it is the procedurally established lower limit.

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

EAL #1 Basis

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

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

EAL #2 Basis

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

Continued loss of RCS inventory may result in escalation to the Alert emergency classification level via either IC CA6 or CA5.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU6 (cont)

Basis Reference(s):

1. NEI 99-01, Rev. 6 CU1
2. Technical Specification 3.4.4, RCS Operational Leakage
3. UFSAR 5.2.5, Primary Containment
4. ST-O-020-560-2/3 REACTOR COOLANT LEAKAGE TEST
5. OT-101 HIGH DRYWELL PRESSURE - PROCEDURE
6. ARC 227-A4 Drywell Hi Pressure Sealed-In
7. ARC 210-A4 Drywell Hi-Lo Pressure
8. DBD P-S-34 RADWASTE SYSTEM, 3.3.1.3.1 Drywell Floor Drain Sump Operation
9. DBD P-S-34 RADWASTE SYSTEM, 3.3.1.3.2 Drywell Equipment Drain Sump Operation
10. T-102, Primary Containment Control

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HG1

Initiating Condition:

HOSTILE ACTION resulting in loss of physical control of the facility.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

1. A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.

   AND

2. a. **ANY** Table H1 safety function **cannot** be controlled or maintained.

   OR

   b. Damage to spent fuel has occurred or is IMMINENT

Table H1 – Safety Functions
• Reactivity Control (ability to shutdown the reactor and keep it shutdown)
• RPV Water Level (ability to cool the core)
• RCS Heat Removal (ability to maintain a heatsink)

Basis:

HOSTILE ACTION: An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILEs, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on 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).

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

PROJECTILE: An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.

PROTECTED AREA: An area that normally encompasses all controlled areas within the security protected area fence.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HG1 (cont)

Basis (cont):

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

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

This IC addresses an event in which a HOSTILE FORCE has taken physical control of the facility to the extent that the plant staff can no longer operate equipment necessary to maintain key safety functions. It also addresses a HOSTILE ACTION leading to a loss of physical control that results in actual or IMMINENT damage to spent fuel due to 1) damage to a spent fuel pool cooling system (e.g., pumps, heat exchangers, controls, etc.) or, 2) loss of spent fuel pool integrity such that sufficient water level cannot be maintained.

Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event.

Security plans and terminology are based on the guidance provided by NEI 03-12, *Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program].*

Basis Reference(s):

1. NEI 99-01, Rev. 6 HG1
2. Station Security Plan – Appendix C
3. SE-23 Response to Security Threats

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS1

Initiating Condition:

HOSTILE ACTION within the PROTECTED AREA.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.

Basis:

HOSTILE ACTION: An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILEs, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on 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).

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

PROJECTILE: An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.

PROTECTED AREA: An area that normally encompasses all controlled areas within the security protected area fence.

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

INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI): A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.

This IC addresses the occurrence of a HOSTILE ACTION within the PROTECTED AREA. This event will require rapid response and assistance due to the possibility for damage to plant equipment.

Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event.

Security plans and terminology are based on the guidance provided by NEI 03-12, *Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program].*

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS1 (cont)

Basis (cont):

As time and conditions allow, these events require a heightened state of readiness by the plant staff and implementation of onsite protective measures (e.g., evacuation, dispersal or sheltering). The Site Area Emergency declaration will mobilize ORO resources and have them available to develop and implement public protective actions in the unlikely event that the attack is successful in impairing multiple safety functions.

This IC does not apply to a HOSTILE ACTION directed at an ISFSI PROTECTED AREA located outside the plant PROTECTED AREA; such an attack should be assessed using IC HA1. It also does not apply to incidents that are accidental events, acts of civil disobedience, or otherwise are not a HOSTILE ACTION perpetrated by a HOSTILE FORCE. Examples include the crash of a small aircraft, shots from hunters, physical disputes between employees, etc. Reporting of these types of events is adequately addressed by other EALs, or the requirements of 10 CFR § 73.71 or 10 CFR § 50.72.

Escalation of the emergency classification level would be via IC HG1.

Basis Reference(s):

1. NEI 99-01 Rev 6, HS1
2. Station Security Plan – Appendix C
3. SE-23 Response to Security Threats

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA1

Initiating Condition:

HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

1. A validated notification from NRC of an aircraft attack threat **< 30 minutes** from the site.

   OR

2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLED AREA.

Basis:

HOSTILE ACTION: An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILEs, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on 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).

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

PROJECTILE: An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.

OWNER CONTROLLED AREA (OCA): The property associated with the station and owned by the company. Access is normally limited to persons entering for official business.

PROTECTED AREA: An area that normally encompasses all controlled areas within the security protected area fence.

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

This IC addresses the occurrence of a HOSTILE ACTION within the OWNER CONTROLLED AREA or notification of an aircraft attack threat. This event will require rapid response and assistance due to the possibility of the attack progressing to the PROTECTED AREA, or the need to prepare the plant and staff for a potential aircraft impact.

Basis (cont):

Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event.

Security plans and terminology are based on the guidance provided by NEI 03-12, *Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Instcu4*

ation Security Program].

As time and conditions allow, these events require a heightened state of readiness by the plant staff and implementation of onsite protective measures (e.g., evacuation, dispersal or sheltering). The Alert declaration will also heighten the awareness of Offsite Response Organizations, allowing them to be better prepared should it be necessary to consider further actions.

This IC does not apply to incidents that are accidental events, acts of civil disobedience, or otherwise are not a HOSTILE ACTION perpetrated by a HOSTILE FORCE. Examples include the crash of a small aircraft, shots from hunters, physical disputes between employees, etc. Reporting of these types of events is adequately addressed by other EALs, or the requirements of 10 CFR § 73.71 or 10 CFR § 50.72.

EAL #1 Basis

Addresses the threat from the impact of an aircraft on the plant, and the anticipated arrival time is within 30 minutes. The intent of this EAL is to ensure that threat-related notifications are made in a timely manner so that plant personnel and OROs are in a heightened state of readiness. This EAL is met when the threat-related information has been validated in accordance with SE-23, Response to Security Threats.

EAL #2 Basis

Applicable for any HOSTILE ACTION occurring, or that has occurred, in the OWNER CONTROLLED AREA. This includes any action directed against an ISFSI that is located outside the plant PROTECTED AREA.

The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may be provided by NORAD through the NRC.

In some cases, it may not be readily apparent if an aircraft impact within the OWNER CONTROLLED AREA was intentional (i.e., a HOSTILE ACTION). It is expected, although not certain, that notification by an appropriate Federal agency to the site would clarify this point. In this case, the appropriate federal agency is intended to be NORAD, FBI, FAA or NRC. The emergency declaration, including one based on other ICs/EALs, should not be unduly delayed while awaiting notification by a Federal agency.

Escalation of the emergency classification level would be via IC HS1.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA1 (cont)

Basis Reference(s):

1. NEI 99-01 Rev 6, HA1
2. Station Security Plan – Appendix C
3. SE-23 Response to Security Threats

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU1

Initiating Condition:

Confirmed SECURITY CONDITION or threat.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities.

   OR

2. A validated notification from the NRC providing information of an aircraft threat.

   OR

3. Notification by the Security Force of a SECURITY CONDITION that does **not** involve a HOSTILE ACTION.

Basis:

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

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

HOSTILE ACTION: An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILEs, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on 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).

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

PROJECTILE: An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.

This IC addresses events that pose a threat to plant personnel or SAFETY SYSTEM equipment, and thus represent a potential degradation in the level of plant safety. Security events which do not meet one of these EALs are adequately addressed by the requirements of 10 CFR § 73.71 or 10 CFR § 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under ICs HA1, HS1 and HG1.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU1 (cont)

Basis (cont):

Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event. Classification of these events will initiate appropriate threat-related notifications to plant personnel and OROs.

Security plans and terminology are based on the guidance provided by NEI 03-12, *Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program].*

EAL #1 Basis

Addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with SY-AA-101-132.

EAL #2 Basis

Addresses the threat from the impact of an aircraft on the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may also be provided by NORAD through the NRC. Validation of the threat is performed in accordance with SE-23, Response to Security Threats.

EAL #3 Basis

References Security Force because these are the individuals trained to confirm that a security event is occurring or has occurred. Training on security event confirmation and classification is controlled due to the nature of Safeguards and 10 CFR § 2.39 information.

Escalation of the emergency classification level would be via IC HA1.

Basis Reference(s):

1. NEI 99-01 Rev 6, HU1
2. Station Security Plan – Appendix C
3. SE-23 Response to Security Threats
4. SY-AA-101-132, Security Assessment and Response to Unusual Activities

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS2

Initiating Condition:

Inability to control a key safety function from outside the Control Room.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per:
   - SE-1, Plant Shutdown from the Remote Shutdown Panel – Procedure
     OR
   - SE-10, Plant Shutdown from the Alternative Shutdown Panels – Procedure

   AND
2. Control of **ANY** Table H1 key safety function is **not** reestablished in **< 15 minutes**.

Table H1 – Safety Functions
• Reactivity Control (ability to shutdown the reactor and keep it shutdown)
• RPV Water Level (ability to cool the core)
• RCS Heat Removal (ability to maintain a heatsink)

Basis:

The time period to establish control of the plant starts when either:

a. Control of the plant is no longer maintained in the Main Control Room
   OR
b. The last Operator has left the Main Control Room.

This IC addresses an evacuation of the Control Room that results in transfer of plant control to alternate locations, and the control of a key safety function cannot be reestablished in a timely manner. The failure to gain control of a key safety function following a transfer of plan control to alternate locations is a precursor to a challenge to one or more fission product barriers within a relatively short period of time.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS2 (cont)

Basis (cont):

The determination of whether or not "control" is established at the remote safe shutdown location(s) is based on Emergency Director judgment. The Emergency Director is expected to make a reasonable, informed judgment within15 minutes

whether or not the operating staff has control of key safety functions from the remote safe shutdown location(s).

Escalation of the emergency classification level would be via IC FG1 or CG6.

Basis Reference(s):

1. NEI 99-01, Rev 6 HS6
2. SE-1, Plant Shutdown from the Remote Shutdown Panel – Procedure
3. SE-10, Plant Shutdown from the Alternative Shutdown Panels – Procedure

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA2

Initiating Condition:

Control Room evacuation resulting in transfer of plant control to alternate locations.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per:

- SE-1, Plant Shutdown from the Remote Shutdown Panel – Procedure
  OR
- SE-10, Plant Shutdown from the Alternative Shutdown Panels – Procedure

Basis:

This IC addresses an evacuation of the Control Room that results in transfer of plant control to alternate locations outside the Control Room. The loss of the ability to control the plant from the Control Room is considered to be a potential substantial degradation in the level of plant safety.

Following a Control Room evacuation, control of the plant will be transferred to alternate shutdown locations. The necessity to control a plant shutdown from outside the Control Room, in addition to responding to the event that required the evacuation of the Control Room, will present challenges to plant operators and other on-shift personnel. Activation of the ERO and emergency response facilities will assist in responding to these challenges.

Escalation of the emergency classification level would be via IC HS2.

Basis Reference(s):

1. NEI 99-01, Rev 6 HA6
2. SE-1, Plant Shutdown from the Remote Shutdown Panel – Procedure
3. SE-10, Plant Shutdown from the Alternative Shutdown Panels – Procedure

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU3

Initiating Condition:

FIRE potentially degrading the level of safety of the plant.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- Escalation of the emergency classification level would be via IC CA2 or MA5

1. A FIRE in **ANY** Table H2 area is **not** extinguished in **< 15-minutes** of **ANY** of the following FIRE detection indications:
   - Report from the field (i.e., visual observation)
   - Receipt of multiple (more than 1) fire alarms or indications
   - Field verification of a single fire alarm

Table H2 – Vital Areas
• Reactor Building (when inerted the Drywell is exempt) • Control Room • Diesel Generator Building • Emergency Pump Structure • Inner Screen Structure • Emergency Cooling Tower • Emergency Switchgear/Battery Rooms • Cable Spread Room

OR

2. a. Receipt of a single fire alarm in **ANY** Table H2 area (i.e. no other indications of a FIRE).

   AND

   b. The existence of a FIRE is **not** verified in **< 30 minutes** of alarm receipt.

   OR

3. A FIRE within the plant PROTECTED AREA or ISFSI PROTECTED AREA **not** extinguished in **< 60-minutes** of the initial report, alarm or indication.

   OR

4. A FIRE within the plant PROTECTED AREA or ISFSI PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY
HU3 (cont)

Basis:

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

PROTECTED AREA: An area that normally encompasses all controlled areas within the security protected area fence.

INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI): A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.

This IC addresses the magnitude and extent of FIRES that may be indicative of a potential degradation of the level of safety of the plant.

EAL #1Basis

The intent of the 15-minute duration is to size the FIRE and to discriminate against small FIRES that are readily extinguished (e.g., smoldering waste paper basket). In addition to alarms, other indications of a FIRE could be a drop in fire main pressure, automatic activation of a suppression system, etc.

Upon receipt, operators will take prompt actions to confirm the validity of an initial fire alarm, indication, or report. For EAL assessment purposes, the emergency declaration clock starts at the time that the initial alarm, indication, or report was received, and not the time that a subsequent verification action was performed. Similarly, the fire duration clock also starts at the time of receipt of the initial alarms, indication or report.

EAL #2 Basis

This EAL addresses receipt of a single fire alarm, and the existence of a FIRE is not verified (i.e., proved or disproved) within 30-minutes of the alarm. Upon receipt, operators will take prompt actions to confirm the validity of a single fire alarm. For EAL assessment purposes, the 30-minute clock starts at the time that the initial alarm was received, and not the time that a subsequent verification action was performed.

A single fire alarm, absent other indication(s) of a FIRE, may be indicative of equipment failure or a spurious activation, and not an actual FIRE. For this reason, additional time is allowed to verify the validity of the alarm. The 30-minute period is a reasonable amount of time to determine if an actual FIRE exists; however, after that time, and absent information to the contrary, it is assumed that an actual FIRE is in progress.

Basis (cont):

If an actual FIRE is verified by a report from the field, then EAL #1 is immediately applicable, and the emergency must be declared if the FIRE is not extinguished within 15-minutes of the report. If the alarm is verified to be due to an equipment failure or a spurious activation, and this verification occurs within 30-minutes of the receipt of the alarm, then this EAL is not applicable and no emergency declaration is warranted.

EAL #3 Basis

In addition to a FIRE addressed by EAL #1 or EAL #2, a FIRE within the plant PROTECTED AREA not extinguished within 60-minutes may also potentially degrade the level of plant safety. This basis extends to a FIRE occurring within the PROTECTED AREA of an ISFSI located outside the plant PROTECTED AREA.

EAL #4 Basis

If a FIRE within the plant or ISFSI PROTECTED AREA is of sufficient size to require a response by an offsite firefighting agency (e.g., a local town Fire Department), then the level of plant safety is potentially degraded. The dispatch of an offsite firefighting agency to the site requires an emergency declaration only if it is needed to actively support firefighting efforts because the fire is beyond the capability of the Fire Brigade to extinguish. Declaration is not necessary if the agency resources are placed on stand-by, or supporting post-extinguishment recovery or investigation actions.

Basis-Related Requirements from Appendix R

Appendix R to 10 CFR 50, states in part:

> Criterion 3 of Appendix A to this part specifies that "Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions."
>
> When considering the effects of fire, those systems associated with achieving and maintaining safe shutdown conditions assume major importance to safety because damage to them can lead to core damage resulting from loss of coolant through boil-off.
>
> Because fire may affect safe shutdown systems and because the loss of function of systems used to mitigate the consequences of design basis accidents under post-fire conditions does not per se impact public safety, the need to limit fire damage to systems required to achieve and maintain safe shutdown conditions is greater than the need to limit fire damage to those systems required to mitigate the consequences of design basis accidents.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU3 (cont)

Basis (cont):

In addition, Appendix R to 10 CFR 50, requires, among other considerations, the use of 1-hour fire barriers for the enclosure of cable and equipment and associated non-safety circuits of one redundant train (G.2.c). As used in EAL #2, the 30-minutes to verify a single alarm is well within this worst-case 1-hour time period.

Depending upon the plant mode at the time of the event, escalation of the emergency classification level would be via IC CA2 or MA5.

Basis Reference(s):

1. NEI 99-01, Rev 6 HU4
2. T-300 Bases, Fire Guides
3. ON-114, Actual Fire Reported in the Power Block, Diesel Generator Building, Emergency Pump, Inner Screen or Emergency Cooling Tower Structures

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU4

Initiating Condition:

Seismic event greater than OBE levels.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

- Escalation of the emergency classification level would be via IC CA2 or MA5
- For emergency classification if EAL 2.b is not able to be confirmed, then the occurrence of a seismic event is confirmed in manner deemed appropriate by the Shift Manager or Emergency Director in **≤ 15 mins** of the event.

1. Seismic event **> Operating Basis Earthquake (OBE)** as indicated by the Alarm on Panel 316 A-5."OPERATING BASIS EARTHQUAKE EXCEEDED"

   OR

2. When Seismic Monitoring Equipment is **not** available:

   a. Control Room personnel feel an actual or potential seismic event.

   AND

   b. **ANY** one of the following confirmed in **≤ 15 mins** of the event:

   - The earthquake resulted in Modified Mercalli Intensity (MMI) **≥ VI** and occurred **≤ 3.5 miles** of the plant.
   - The earthquake was magnitude **≥ 6.0**
   - The earthquake was magnitude **≥ 5.0** and occurred **≤ 125 miles** of the plant.

Basis:

This IC addresses a seismic event that results in accelerations at the plant site greater than those specified for an Operating Basis Earthquake (OBE)[1]. An earthquake greater than an OBE but less than a Safe Shutdown Earthquake (SSE)[2] should have no significant impact on safety-related systems, structures and components; however, some time may be required for the plant staff to ascertain the actual post-event condition of the plant (e.g., performs walk-downs and post-event inspections).

---

[1] An OBE is vibratory ground motion for which those features of a nuclear power plant necessary for continued operation without undue risk to the health and safety of the public will remain functional.

[2] An SSE is vibratory ground motion for which certain (generally, safety-related) structures, systems, and components must be designed to remain functional.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU4 (cont)

Basis (cont):

Given the time necessary to perform walk-downs and inspections, and fully understand any impacts, this event represents a potential degradation of the level of safety of the plant.

Event verification with external sources should not be necessary during or following an OBE. Earthquakes of this magnitude should be readily felt by on-site personnel and recognized as a seismic event (e.g., typical lateral accelerations are in excess of 0.08g). The Shift Manager or Emergency Director may seek external verification if deemed appropriate (e.g., a call to the USGS, check internet news sources, etc.); however, the verification action must not preclude a timely emergency declaration.

EAL #2.b and the accompanying note is included to ensure that a declaration does not result from felt vibrations caused by a non-seismic source (e.g., a dropped load). The Shift Manager or Emergency Director may seek external verification if deemed appropriate (e.g., call to USGS, check internet source, etc.) however, the verification action must not preclude a timely emergency declaration. This guidance recognizes that it may cause the site to declare an Unusual Event while another site, similarly affected but with readily available OBE indications in the Control Room, may not.

Depending upon the plant mode at the time of the event, escalation of the emergency classification level would be via IC CA2 or MA5.

Basis Reference(s):

1. NEI 99-01, Rev 6 HU2
2. SE-5, Earthquake – Bases
3. US NRC Reg. Guide 1.166, Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Earthquake Actions.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA5

Initiating Condition:

Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown.

Operatng Mode Applicability:

1, 2, 3, 4, 5

Emergency Action Level (EAL):

Note:

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

1. Release of a toxic, corrosive, asphyxiant or flammable gas in a Table H3 area:

Table H3 Areas with Entry Related Mode Applicability	
Area of concern	**Entry Related Mode Applicability**
Reactor Building 135' all areas	Modes 3, 4 and 5
Control Room	Modes 1, 2, 3, 4, and 5

AND

2. Entry into the room or area is prohibited or impeded

Basis:

This IC addresses an event involving a release of a hazardous gas that precludes or impedes access to equipment necessary to maintain normal plant operation, or required for a normal plant cooldown and shutdown. This condition represents an actual or potential substantial degradation of the level of safety of the plant.

Basis (cont):

Assuming all plant equipment is operating as designed, normal operation is capable from the Main Control Room (MCR). The plant is also able to transition into a hot shutdown condition from the MCR, therefore Table H3 is a list of plant rooms or areas, in addition to the main control room, with entry-related mode applicability that contain equipment which require a manual/local action necessary to transition the plant from normal plant operation, cooldown and shutdown as specified in normal operating procedures (establish shutdown cooling), where if this action is not completed the plant would not be able to attain and maintain cold shutdown.

This Table does not include rooms or areas for which entry is required solely to perform actions of an administrative or record keeping nature (e.g., normal rounds or routine inspections).

An Alert declaration is warranted if entry into the affected room/area is, or may be, procedurally required during the plant operating mode in effect and the gaseous release preclude the ability to place shutdown cooling in service. The emergency classification is not contingent upon whether entry is actually necessary at the time of the release.

Evaluation of the IC and EAL do not require atmospheric sampling; it only requires the Emergency Director's judgment that the gas concentration in the affected room/area is sufficient to preclude or significantly impede procedurally required access. This judgment may be based on a variety of factors including an existing job hazard analysis, report of ill effects on personnel, advice from a subject matter expert or operating experience with the same or similar hazards. Access should be considered as impeded if extraordinary measures are necessary to facilitate entry of personnel into the affected room/area (e.g., requiring use of protective equipment, such as SCBAs, that is not routinely employed).

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

- The plant is in an operating mode different than the mode specified for the affected room/area (i.e., entry is not required during the operating mode in effect at the time of the gaseous release). For example, the plant is in Mode 1 when the gaseous release occurs, and the procedures used for normal operation, cooldown and shutdown do not require entry into the affected room until Mode 4.
- The gas release is a planned activity that includes compensatory measures which address the temporary inaccessibility of a room or area (e.g., fire suppression system testing).
- The action for which room/area entry is required is of an administrative or record keeping nature (e.g., normal rounds or routine inspections).
- The access control measures are of a conservative or precautionary nature, and would not actually prevent or impede a required action.

An asphyxiant is a gas capable of reducing the level of oxygen in the body to dangerous levels. Most commonly, asphyxiants work by merely displacing air in an enclosed

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA5 (cont)

Basis (cont):

environment. This reduces the concentration of oxygen below the normal level of around 19%, which can lead to breathing difficulties, unconsciousness or even death.

This EAL does not apply to firefighting activities that generate smoke, that automatically or manually activate a fire suppression system in an area, or to intentional inerting of containment.

The Operating Mode Applicability of this EAL has been revised from All Modes to modes 1, 2, 3 4, and 5 due to the mode applicability of the areas of concern in Table H-3. In the future should the areas of concern in Table H-3 be revised then the Operating Mode Applicability of this EAL should be reevaluated.

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

Basis Reference(s):

1. NEI 99-01, Rev 6 HA5
2. T-300 Bases
3. AR 660892, Station Halon and IDLH Evaluations
4. 29CFR1910.134(b) and 29CFR1910.134(d)(2)(iii)
5. ON-114, Actual Fire Reported in the Power Block, Diesel Generator Building, Emergency Pump, Inner Screen or Emergency Cooling Tower Structures
6. SO 10.1.B-2(3), "Residual Heat Removal System Shutdown Cooling Mode Manual Start"

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU6

Initiating Condition:

Hazardous Event

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

- EAL #4 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents.
- Escalation of the emergency classification level would be via IC CA2 or MA5

1. Tornado strike within the PROTECTED AREA.

   OR

2. Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component required by Technical Specifications for the current operating mode.

   OR

3. Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release).

   OR

4. A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles.

   OR

5. Abnormal River level, as indicated by **EITHER**:
   - **> 112 ft.** (high level)

     OR

   - **< 98.5 ft.** (low level)

Basis:

PROTECTED AREA: An area that normally encompasses all controlled areas within the security protected area fence.

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

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU6 (cont)

Basis (cont):

This IC addresses hazardous events that are considered to represent a potential degradation of the level of safety of the plant.

EAL #1 Basis

Addresses a tornado striking (touching down) within the Protected Area.

EAL #2 Basis

Addresses flooding of a building room or area that results in operators isolating power to a SAFETY SYSTEM component due to water level or other wetting concerns. Classification is also required if the water level or related wetting causes an automatic isolation of a SAFETY SYSTEM component from its power source (e.g., a breaker or relay trip). To warrant classification, operability of the affected component must be required by Technical Specifications for the current operating mode.

EAL #3 Basis

Addresses a hazardous materials event originating at an offsite location and of sufficient magnitude to impede the movement of personnel within the PROTECTED AREA.

EAL #4 Basis

Addresses a hazardous event that causes an on-site impediment to vehicle movement and significant enough to prohibit the plant staff from accessing the site using personal vehicles. Examples of such an event include site flooding caused by a hurricane, heavy rains, up-river water releases, dam failure, etc., or an on-site train derailment blocking the access road.

This EAL is not intended to apply to routine impediments such as fog, snow, ice, or vehicle breakdowns or accidents, but rather to more significant conditions such as the Hurricane Andrew strike on Turkey Point in 1992, the flooding around the Cooper Station during the Midwest floods of 1993, or the flooding around Ft. Calhoun Station in 2011.

Basis (cont):

EAL #5 Basis

Cooling water is pumped from the normal heat sink (Conowingo Pond) via the pump structure.

High River level of greater than 112 feet: At this level open grating in the operating floor of the Circulating Water Pump Structure will allow water from the circulating water bays to rise into the structure during postulated external flooding conditions. Per the UFSAR, "The configuration of the circulating water system would likely trip at a flood elevation of about 113 feet. Therefore, a river elevation of 111 feet was chosen as the elevation at which a "flood-related shutdown is initiated." The use of a threshold of 112 feet for the Unusual Event would represent a condition prior to the postulated loss of circulating water.

Low River level of less than 98.5 feet: This is the plant low water design level and consistent with T.S. 3.7.2 (Minimum Water Level in Pump Bay). Per the UFSAR, with river level at 104 feet, when an uncontrolled release of about 350,000 cfs is passed through the Conowingo Dam and there is no in flow into pond, it will require about 1-1/2 hours to drop level to 98.5 feet.

Escalation of the emergency classification level would be based on ICs in Recognition Categories R, F, M, H or C.

Basis Reference(s):

1. NEI 99-01, Rev 6 HU3
2. SE-4, Flood – Bases
3. DBD P-T-09, Internal Hazards
4. UFSAR Section 2.4.3.5.5, Emergency Shutdown due to High or Low Water Level in Conowingo Pond

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HG7

Initiating Condition:

Other conditions exist which in the judgment of the Emergency Director warrant declaration of a GENERAL EMERGENCY.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Basis:

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

HOSTILE ACTION: An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILEs, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on 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).

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

PROJECTILE: An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for a General Emergency.

Basis Reference(s):

1. NEI 99-01, Rev 6 HG7

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HS7

Initiating Condition:

Other conditions exist which in the judgment of the Emergency Director warrant declaration of a SITE AREA EMERGENCY.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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.

Basis:

HOSTILE ACTION: An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILEs, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on 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).

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

PROJECTILE: An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for a Site Area Emergency.

Basis Reference(s):

1. NEI 99-01, Rev 6 HS7

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HA7

Initiating Condition:

Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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.

Basis:

HOSTILE ACTION: An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILEs, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on 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).

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

PROJECTILE: An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for an Alert.

Basis Reference(s):

1. NEI 99-01, Rev 6 HA7

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

HU7

Initiating Condition:

Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Basis:

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for an UNUSUAL EVENT.

Basis Reference(s):

1. NEI 99-01, Rev 6 HU7

RECOGNITION CATEGORY
ISFSI MALFUNCTIONS

E-HU1

Initiating Condition

Damage to a loaded cask CONFINEMENT BOUNDARY.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading:

1. Cask numbers 45, 46, and 47 only:
   - **> 240 mrem/hr gamma or > 20 mrem/hr neutron** on the top (protective cover).
     OR
   - **> 150 mrem/hr gamma or > 20 mrem/hr neutron** on the sides of the radial neutron shield.
     OR
   - **> 720 mrem/hr gamma or > 90 mrem/hr neutron** on the side surfaces of the cask above the radial neutron shield.
     OR
   - **> 420 mrem/hr gamma or > 140 mrem/hr neutron** on the side surfaces of the cask below the radial neutron shield.

OR

2. All casks except for cask numbers 45, 46, and 47:
   - **> 350 mrem/hr gamma or > 30 mrem/hr neutron** on the top (protective cover).
     OR
   - **> 250 mrem/hr gamma or > 60 mrem/hr neutron** on the sides of the radial neutron shield.
     OR
   - **> 1100 mrem/hr gamma or > 250 mrem/hr neutron** on the side surfaces of the cask above the radial neutron shield.
     OR
   - **> 800 mrem/hr gamma or >600 mrem/hr neutron** on the side surfaces of the cask below the radial neutron shield.

Basis:

CONFINEMENT BOUNDARY: The irradiated fuel dry storage cask barrier(s) between areas containing radioactive substances and the environment.

INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) : A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.

This IC addresses an event that results in damage to the CONFINEMENT BOUNDARY of a storage cask containing spent fuel. It applies to irradiated fuel that is licensed for

RECOGNITION CATEGORY
ISFSI MALFUNCTIONS

E-HU1 (cont)

Basis (cont):

dry storage beginning at the point that the loaded storage cask is sealed. The word cask, as used in this EAL, refers to the storage container in use at the site for dry storage of irradiated fuel. The issues of concern are the creation of a potential or actual release path to the environment, degradation of one or more fuel assemblies due to environmental factors, and configuration changes which could cause challenges in removing the cask or fuel from storage.

The existence of "damage" is determined by radiological survey. The technical specification multiple of "2 times", which is also used in Recognition Category R IC RU1, is used here to distinguish between non-emergency and emergency conditions. The emphasis for this classification is the degradation in the level of safety of the spent fuel cask and not the magnitude of the associated dose or dose rate. It is recognized that in the case of extreme damage to a loaded cask, the fact that the "on-contact" dose rate limit is exceeded may be determined based on measurement of a dose rate at some distance from the cask.

Security-related events for ISFSIs are covered under ICs HU1 and HA1.

Basis Reference(s):

1. NEI 99-01, Rev 6 E-HU1
2. Certificate of Compliance No.1027, TN-68 Technical Specifications Amendments 0, and 1