

ISFSI MALFUNCTION

E-HU1

ECL: Notification of Unusual Event

Initiating Condition: Damage to a loaded cask CONFINEMENT BOUNDARY.

Operating Mode Applicability: All

Emergency Action Levels:

- (1) Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than (2 times the site-specific cask specific technical specification allowable radiation level) on the surface of the spent fuel cask ANY value listed on Table E1.

Commented [37]: V16 ISFSI TS/Dose Reading Calculation

Table E1	
Location of Dose Rate	Total Dose Rate (Neutron + Gamma mR/hr)
HI-TRAC 125	
Side - Mid- height	450
Top	110
HI-STAR 100 or HI-STORM 100	
Side - 60 inches below mid- height	80
Side - Mid- height	80
Side - 60 inches above mid- height	30
Center of lid	10
Middle of top lid	20
Top (outlet) duct	40
Bottom (inlet) duct	140

Commented [38]: V16 ISFSI TS/Dose Reading Calculation

Basis:

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

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 dry storage beginning at the point that the loaded storage cask is sealed. 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 that could cause challenges in removing the cask or fuel from storage.

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The existence of "damage" is determined by radiological survey. The radiation reading values listed in the table represent 2 times the site-specific cask-specific technical specification allowable radiation level on the designated surface of the spent fuel cask. 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~~ determining if 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.

Developer Notes:

~~The results of the ISFSI Safety Analysis Report (SAR) [per NUREG-1536], or a SAR referenced in the cask Certificate of Compliance and the related NRC Safety Evaluation Report, identify the natural phenomena events and accident conditions that could potentially affect the CONFINEMENT BOUNDARY. This EAL addresses damage that could result from the range of identified natural or man-made events (e.g., a dropped or tipped over cask, EXPLOSION, FIRE, EARTHQUAKE, etc.).~~

~~The allowable radiation level for a spent fuel cask can be found in the cask's technical specification located in the Certificate of Compliance.~~

~~—— ECL Assignment Attributes: 3.1.1.B~~

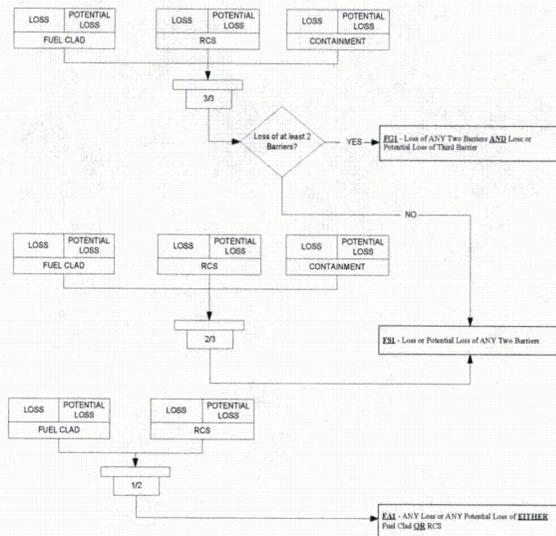
96 FISSION PRODUCT BARRIER ICS/EALS

Table 9-F-1: Recognition Category "F" Initiating Condition Matrix

GENERAL EMERGENCY	
FGI	Loss of any two barriers and Loss or Potential Loss of the third barrier. <i>Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown</i>
SITE AREA EMERGENCY	
FSI	Loss or Potential Loss of any two barriers. <i>Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown</i>
ALERT	
FAI	Any Loss or any Potential Loss of either the Fuel Clad or RCS barrier. <i>Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown</i>

See Table 9-F-2 for BWR EALS

Developer Note: The adjacent logic flow diagram is for use by developers and is not required for site specific implementation; however, a site specific scheme must include some type of user aid to facilitate timely and accurate classification of fission product barrier losses and/or potential losses. Such aids are typically comprised of logic flow diagrams, "scoring" criteria or checkbox-type matrices. The user aid logic must be consistent with that of the adjacent diagram.



Developer Notes

1. The logic used for these initiating conditions reflects the following considerations:
 - The Fuel Clad Barrier and the RCS Barrier are weighted more heavily than the Containment Barrier.
 - Unusual Event ICs associated with fission product barriers are addressed in Recognition Category S.
2. For accident conditions involving a radiological release, evaluation of the fission product barrier thresholds will need to be performed in conjunction with dose assessments to ensure correct and timely escalation of the emergency classification. For example, an evaluation of the fission product barrier thresholds may result in a Site Area Emergency classification while a dose assessment may indicate that an EAL for General Emergency IC RGI has been exceeded.
3. The fission product barrier thresholds specified within a scheme are expected to reflect plant specific design and operating characteristics. This may require that developers create different thresholds than those provided in the generic guidance.
4. Alternative presentation methods for the Recognition Category F ICs and fission product barrier thresholds are acceptable and include flow charts, block diagrams, and checklist type tables. Developers must ensure that the site specific method addresses all possible threshold combinations and classification outcomes shown in the BWR or PWR EAL fission product barrier tables. The NRC staff considers the presentation method of the Recognition Category F information to be an important user aid and may request a change to a particular proposed method if, among other reasons, the change is necessary to promote consistency across the industry.
5. As used in this Recognition Category, the term RCS leakage encompasses not just those types defined in Technical Specifications but also includes the loss of RCS mass to any location—inside containment, a secondary side system (i.e., PWR steam generator tube leakage), an interfacing system, or outside of containment. The release of liquid or steam mass from the RCS due to the as designed/expected operation of a relief valve is not considered to be RCS leakage.
6. At the Site Area Emergency level, classification decision makers should maintain cognizance of how far present conditions are from meeting a threshold that would require a General Emergency declaration. For example, if the Fuel Clad and RCS fission product barriers were both lost, then there should be frequent assessments of containment radioactive inventory and integrity. Alternatively, if both the Fuel Clad and RCS fission product barriers were potentially lost, the Emergency Director would have more assurance that there was no immediate need to escalate to a General Emergency.
7. The ability to escalate to a higher emergency classification level in response to degrading conditions should be maintained. For example, a steady increase in RCS leakage would represent an increasing risk to public health and safety.

Fission Product Barrier Table
Thresholds for LOSS or POTENTIAL LOSS of Barriers

FGI GENERAL EMERGENCY	FSI SITE AREA EMERGENCY	FAI ALERT
Loss of any two barriers and Loss or Potential Loss of the third barrier.	Loss or Potential Loss of any two barriers.	Any Loss or any Potential Loss of either the Fuel Clad or RCS barrier.

Fuel Clad Barrier		RCS Barrier		Containment Barrier	
LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS
1. RCS Activity		1. Primary Containment Pressure		1. Primary Containment Conditions	
A. (Site-specific indications that reactor coolant activity is greater than 300 µCi/gm dose equivalent I-131) Activity of 300 µCi/gm DEI ₁₃₁	Not Applicable	A. Primary containment pressure greater than 1.85 psig (site-specific value) due to RCS leakage.	Not Applicable	A. UNPLANNED rapid drop in primary containment pressure following primary containment pressure rise OR B. Primary containment pressure response not consistent with LOCA conditions.	A. Primary containment pressure greater than (site-specific value) 56 psig OR B. Greater than or equal to 6% H ₂ AND 5% O ₂ (site-specific explosive mixture) exists inside primary containment OR C. HCTL exceeded.
2. RPV Water Level		2. RPV Water Level		2. RPV Water Level	
A. Primary containment flooding required SAG	A. RPV water level cannot be restored and maintained above	A. RPV water level cannot be restored and maintained above -155 inches	Not Applicable	Not Applicable	A. Primary containment flooding required SAG

Commented [39]: V17 Primary Containment Pressure Reference (1.85 psig)

Commented [40]: V11 Primary Containment Pressure Reference (> 56 psig)

Commented [41]: V10 H₂ and O₂ Concentration calculation/reference

Commented [44]: V7 RPV Level Indications/Display

Fuel Clad Barrier		RCS Barrier		Containment Barrier	
LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS
entry is required.	-155 inches (site-specific RPV water level corresponding to the top of active fuel) or cannot be determined.	(site-specific RPV water level corresponding to the top of active fuel) or cannot be determined.			entry is required.
3. Not Applicable		3. RCS Leak Rate		3. Primary Containment Isolation Failure	
Not Applicable	Not Applicable	A. UNISOLABLE break in Main Steamline, HPCI, Feedwater, RWCU, or RCIC ANY of the following: (site-specific systems with potential for high-energy line breaks) OR B. Emergency RPV Depressurization.	A. UNISOLABLE primary system leakage that results in exceeding EITHER of the following: 1. Max Normal Operating Temperature OR 2. Max Normal Operating Area Radiation Level.	A. UNISOLABLE direct downstream pathway to the environment exists after primary containment isolation signal OR B. Intentional primary containment venting per EOPs OR C. UNISOLABLE primary system leakage that results in exceeding EITHER of the following: 1. Max Safe Operating Temperature OR 2. Max Safe	Not Applicable

Commented [42]: Incorporates FAQ 2015-004

Commented [43]: V7 RPV Level Indications/Display

Commented [45]: Incorporates FAQ 2015-004

Commented [46]: V18 Secondary Containment Temperatures

Commented [47]: V12 Secondary Containment Rad Monitors

Commented [48]: V18 Secondary Containment Temperatures

Fuel Clad Barrier		RCS Barrier		Containment Barrier	
LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS
				Operating Area Radiation Level.	
4. Primary Containment Radiation		4. Primary Containment Radiation		4. Primary Containment Radiation	
A. DWRRM greater than 1,400 R/h. Primary containment radiation monitor reading greater than (site-specific value).	Not Applicable	A. DWRRM greater than 40 R/h. Primary containment radiation monitor reading greater than (site-specific value).	Not Applicable	Not Applicable	A. DWRRM greater than 26,000 R/hr. Primary containment radiation monitor reading greater than (site-specific value).
5. Other Indications		5. Other Indications		5. Other Indications	
A. (site-specific as applicable) Offgas Pre- and Post-Treatment Monitors Offscale High.	Not Applicable. A. (site-specific as applicable).	A. (site-specific as applicable) Drywell Fission Product Monitor reading 5.0×10^5 cpm.	Not Applicable. A. (site-specific as applicable).	Not Applicable. A. (site-specific as applicable).	Not Applicable. A. (site-specific as applicable).
6. Emergency Director Judgment		6. Emergency Director Judgment		6. Emergency Director Judgment	
A. ANY condition in the opinion of the emergency director that indicates loss of the fuel clad barrier.	A. ANY condition in the opinion of the emergency director that indicates potential loss of the fuel clad barrier.	A. ANY condition in the opinion of the emergency director that indicates loss of the RCS Barrier.	A. ANY condition in the opinion of the emergency director that indicates potential loss of the RCS Barrier.	A. ANY condition in the opinion of the emergency director that indicates loss of the Containment Barrier.	A. ANY condition in the opinion of the emergency director that indicates potential loss of the Containment Barrier.

Commented [49]: V12 Secondary Containment Rad Monitors

Commented [50]: V2 Rad Monitor Calculation

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Basis Information For ~~BWR EAL~~ Fission Product Barrier ~~EALs~~ Table 9-F-2

~~BWR~~-FUEL CLAD BARRIER THRESHOLDS:

The fuel clad barrier consists of the zircalloy or stainless steel fuel bundle tubes that contain the fuel pellets.

1. **RCS Activity**

Loss 1.A

This threshold indicates that RCS radioactivity concentration is greater than 300 $\mu\text{Ci/gm}$ 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% percent 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.

~~Developer Notes:~~

~~Threshold values should be determined assuming RCS radioactivity concentration equals 300 $\mu\text{Ci/gm}$ dose equivalent I-131. Other site specific units may be used (e.g., $\mu\text{Ci/cc}$).~~

~~Depending upon site specific capabilities, this threshold may have a sample analysis component and/or a radiation monitor reading component.~~

~~Add this paragraph (or similar wording) to the Basis if the threshold includes a sample analysis component, "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."~~

2. **RPV Water Level**

Loss 2.A

The Loss threshold represents ~~the any~~ EOP requirement for ~~primary containment flooding~~ entry into the Severe Accident Guidelines. This is identified in the BWROG EPGs/SAGs 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 ~~adequate core cooling cannot be assured.~~

Commented [55]: Incorporates FAQ 2015-004 Guidance

Potential Loss 2.A

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 Loss threshold 2.A. ~~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 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 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.

In high-power ATWS/failure to scram events, EOPs may direct the operator to deliberately lower RPV water level to the top of active fuel in order to reduce reactor power. RPV water level is then controlled between the top of active fuel and the Minimum Steam Cooling RPV Water Level (MSCRWL). 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 SA5 or SS5 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.

Developer Notes:

Loss 2.A

The phrase, "Primary containment flooding required," should be modified to agree with the site specific EOP phrase indicating exit from all EOPs and entry to the SAGs (e.g., drywell flooding required, etc.).

Potential Loss 2.A

The decision that "RPV water level cannot be determined" is directed by guidance given in the RPV water level control sections of the EOPs.

3. **Not Applicable** (included for numbering consistency between barrier tables)

4. **Primary Containment Radiation**

Loss 4.A

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 $\mu\text{Ci/gm}$ 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% percent 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 loss threshold 4.A 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 potential loss threshold associated with primary containment radiation.

Developer Notes:

The reading should be determined assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory, with RCS radioactivity concentration equal to 300 $\mu\text{Ci/gm}$ dose equivalent I-131, into the primary containment atmosphere.

5. **Other Indications**

Loss 5A

Readings from Offgas pre- and post-treatment monitors that indicate Offscale High are used to detect the effluent of the Offgas system and therefore indicate fission products escaping the clad. Calculated readings for 300 $\mu\text{Ci/gm}$ are $4.82 \times e+8$ cps and the instruments to of scale is $1 e+6$ cps. These instruments going high offscale provide an indication that there is clad damage to aid in classification of an event. Sample results are still needed to establish that the 300 $\mu\text{Ci/gm}$ threshold is being exceeded.

There is no potential loss threshold associated with Other Indications.

Loss and/or Potential Loss 5.A

This subcategory addresses other site-specific thresholds that may be included to indicate loss or potential loss of the Fuel-Clad barrier based on plant-specific design characteristics not considered in the generic guidance.

Developer Notes:

Loss and/or Potential Loss 5.A

Developers should determine if other reliable indicators exist to evaluate the status of this fission product barrier (e.g., review accident analyses described in the site Final Safety Analysis Report, as updated). The goal is to identify any unique or site-specific indications that will promote timely and accurate assessment of barrier status.

Any added thresholds should represent approximately the same relative threat to the barrier as the other thresholds in this column. Basis information for the other thresholds may be used to gauge the relative barrier threat level.

6. Emergency Director Judgment

Loss 6.A

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 6.A

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~~ will also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

Developer Notes:

None

BWR-RCS BARRIER THRESHOLDS:

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

1. Primary Containment Pressure

Loss 1.A

The ~~(site specific value)~~ greater than 1.85 psig primary containment pressure is the drywell high pressure setpoint which indicates a LOCA by automatically initiating the ECCS or equivalent makeup system.

There is no potential loss threshold associated with primary containment pressure.

Developer Notes:

None

2. RPV Water Level

Loss 2.A

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

The RPV water level threshold is the same as fuel clad barrier potential loss threshold 2.A. ~~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 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.

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

Commented [56]: V17 Primary Containment Pressure Reference (1.85 psig)

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.

In high-power ATWS/failure to scram events, EOPs may direct the operator to deliberately lower RPV water level to the top of active fuel in order to reduce reactor power. RPV water level is then controlled between the top of active fuel and the Minimum Steam Cooling RPV Water Level (MSCRWL). 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 SA5 or SS5 will dictate the need for emergency classification.

There is no RCS potential loss threshold associated with RPV water level.

3. RCS Leak Rate

Loss Threshold 3.A

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 from the control room, the RCS barrier loss threshold is met.

Loss Threshold 3.B

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 suppression pool, a loss of the RCS barrier exists due to the diminished effectiveness of the RCS to retain fission products within its boundary.

Commented [57]: Incorporates FAQ 2015-003 Guidance

Potential Loss Threshold 3.A

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~~ that 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.

An UNISOLABLE leak which is indicated by Max Normal Operating values escalates to a Site Area Emergency when combined with containment barrier loss threshold 3.A (after

a containment isolation) and a General Emergency when the fuel clad barrier criteria is also exceeded.

Developer Notes:

Loss Threshold 3.A

The list of systems included in this threshold should be the high energy lines which, if ruptured and remain unisolated, can rapidly depressurize the RPV. These lines are typically isolated by actuation of the Leak Detection system.

Large high energy line breaks such as Main Steam Line (MSL), High Pressure Coolant Injection (HPCI), Feedwater, Reactor Water Cleanup (RWCU), Isolation Condenser (IC) or Reactor Core Isolation Cooling (RCIC) that are UNISOLABLE represent a significant loss of the RCS barrier.

4. Primary Containment Radiation

Loss 4.A

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 loss threshold 4.A since it indicates a loss of the RCS barrier only.

There is no potential loss threshold associated with primary containment radiation.

Developer Notes:

The reading should be determined assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory, with RCS activity at Technical Specification allowable limits, into the primary containment atmosphere. Using RCS activity at Technical Specification allowable limits aligns this threshold with IC SU3. Also, RCS activity at this level will typically result in primary containment radiation levels that can be more readily detected by primary containment radiation monitors, and more readily differentiated from those caused by piping or component "shine" sources. If desired, a plant may use a lesser value of RCS activity for determining this value.

In some cases, the site specific physical location and sensitivity of the primary containment radiation monitor(s) may be such that radiation from a cloud of released RCS gases cannot be distinguished from radiation emanating from piping and components containing elevated reactor coolant activity. If so, refer to the Developer Guidance for Loss/Potential Loss 5.A and determine if an alternate indication is available.

5. Other Indications

Loss 5A

A Drywell Fission Products Monitor reading 5.0×10^5 cpm indicates a breach of the RCS as an effluent. The monitor value calculated in Calculation SMNH-13-021, Rev 1, was 1.008×10^6 cpm; however, the top of the scale for the monitor is 1×10^6 cpm. Therefore,

the EAL threshold value has been established at one half decade below top of scale to aid the operator in distinguishing between a loss of RCS event and an instrument failure resulting in the monitor reading high off scale. No radiation monitors capable of indicating a potential loss of the RCS barrier were identified.

There is no Potential Loss Threshold associated with Other Indications.

Loss and/or Potential Loss 5.A

~~This subcategory addresses other site-specific thresholds that may be included to indicate loss or potential loss of the RCS barrier based on plant-specific design characteristics not considered in the generic guidance.~~

~~**Developer Notes:**~~

~~Loss and/or Potential Loss 5.A~~

~~Developers should determine if other reliable indicators exist to evaluate the status of this fission product barrier (e.g., review accident analyses described in the site Final Safety Analysis Report, as updated). The goal is to identify any unique or site-specific indications that will promote timely and accurate assessment of barrier status.~~

~~Any added thresholds should represent approximately the same relative threat to the barrier as the other thresholds in this column. Basis information for the other thresholds may be used to gauge the relative barrier threat level.~~

6. Emergency Director Judgment

Loss 6.A

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 6.A

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~~ will also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

~~**Developer Notes:**~~

~~None~~

BWR-CONTAINMENT BARRIER THRESHOLDS:

The primary containment barrier includes the drywell, the wetwell, their respective interconnecting paths, and other connections up to and including the outermost containment isolation valves. Containment barrier thresholds are used as criteria for escalation of the ECL from Alert to a Site Area Emergency or a General Emergency.

1. Primary Containment Conditions

Loss 1.A and 1.B

Rapid UNPLANNED loss of primary containment pressure (i.e., not attributable to drywell spray or condensation effects) following an initial pressure increase indicates a loss of primary containment integrity. Primary containment pressure should increase 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.

Potential Loss 1.A

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,~~ represents a potential loss of the containment barrier.

Potential Loss 1.B

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 1.C

The heat capacity temperature limit (HCTL) is the highest suppression pool temperature from which emergency RPV depressurization will not raise:

Suppression chamber temperature above the maximum temperature capability of the suppression chamber and equipment within the suppression chamber which may be required to operate when the RPV is pressurized,

OR

Suppression chamber pressure above Primary Containment Pressure Limit A, while the rate of energy transfer from the RPV to the containment is greater than the capacity of the containment vent.

The HCTL is a function of RPV pressure, suppression pool temperature and suppression pool water level. It is ~~utilized~~ used 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.

Developer Notes:

Potential Loss 1.B

BWR EPGs/SAGs specifically define the limits associated with explosive mixtures in terms of deflagration concentrations of hydrogen and oxygen. For Mk I/II containments the deflagration limits are “6% hydrogen and 5% oxygen in the drywell or suppression chamber”. For Mk III containments, the limit is the “Hydrogen Deflagration Overpressure Limit”. The threshold term “explosive mixture” is synonymous with the EPG/SAG “deflagration limits”.

Potential Loss 1.C

Since the HCTL is defined assuming a range of suppression pool water levels as low as the elevation of the downcomer openings in Mk I/II containments, or 2 feet above the elevation of the horizontal vents in a Mk III containment, it is unnecessary to consider separate Containment barrier Loss or Potential Loss thresholds for abnormal suppression pool water level conditions. If desired, developers may include a separate Containment Potential Loss threshold based on the inability to maintain suppression pool water level above the downcomer openings in Mk I/II containments, or 2 feet above the elevation of the horizontal vents in a Mk III containment with RPV pressure above the minimum decay heat removal pressure, if it will simplify the assessment of the suppression pool level component of the HCTL.

2. RPV Water Level

There is no loss threshold associated with RPV water level.

Potential Loss 2.A

The potential loss threshold is identical to the Fuel Clad Loss RPV Water Level threshold 2.A. The potential loss requirement for ~~Primary Containment Flooding~~ entry into the Severe Accident Guidelines indicates adequate core cooling cannot be ~~restored and maintained~~ assured and that core damage is possible. BWR EPGs/SAGs specify the conditions ~~that require primary containment flooding. When primary containment flooding is required,~~ when the EPGs are exited and SAGs are entered. Entry into SAGs is a logical escalation in response to the inability to ~~restore and maintain~~ assure adequate core cooling.

PRA studies indicate that the condition of this potential loss threshold ~~could be~~ is a core melt sequence ~~which~~ that, 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.

Commented [58]: Incorporates FAQ 2015-004 Guidance

Developer Notes:

The phrase, "Primary containment flooding required," should be modified to agree with the site-specific EOP phrase indicating exit from all EOPs and entry to the SAGs (e.g., drywell flooding required, etc.).

3. Primary Containment Isolation Failure

These thresholds address incomplete containment isolation (automatic or manual) that allows an UNISOLABLE direct release to the environment. A release path is 'direct' if it allows for the migration of radioactive material from the containment to the environment in a generally uninterrupted manner (e.g., little or no holdup time); therefore, within the context of a containment barrier loss or potential loss threshold, a release path to the wetwell is a direct release path.

Commented [59]: Incorporates FAQ 2015-006 Guidance

Loss 3.A

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).

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 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 3.B

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~~ will 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 3.C

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~~-use these temperatures and radiation levels to establish conditions under which RPV depressurization is required.

The temperatures and radiation levels ~~should~~-will 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~~-that connect directly to the RPV ~~such that~~-ensuring a reduction in RPV pressure will effect a decrease in the steam or water being discharged through an unisolated break in the system.

In combination with RCS potential loss 3.A this threshold would result in a Site Area Emergency.

There is no potential loss threshold associated with Primary Containment Isolation Failure.

Developer Notes:

Loss 3.B

~~Consideration may be given to specifying the specific procedural step within the Primary Containment Control EOP that defines intentional venting of the Primary Containment regardless of offsite radioactivity release rate.~~

4. Primary Containment Radiation

There is no loss threshold associated with primary containment radiation.

Potential Loss 4.A

The radiation monitor reading corresponds to an instantaneous release of all reactor coolant mass into the primary containment, assuming that ~~20%~~-percent 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%~~-percent 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~~-that would then escalate the emergency classification level to a General Emergency.

Developer Notes:

~~NUREG-1228, *Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents*, provides the basis for using the 20% fuel cladding failure value. Unless there is a site-specific analysis justifying a different value, the reading should be determined assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with 20% fuel clad failure into the primary containment atmosphere.~~

5. **Other Indications**

Not Applicable (included for numbering consistency between barrier tables)

~~Loss and/or Potential Loss 5.A~~

~~This subcategory addresses other site-specific thresholds that may be included to indicate loss or potential loss of the Containment barrier based on plant-specific design characteristics not considered in the generic guidance.~~

~~Developer Notes:~~

~~Loss and/or Potential Loss 5.A~~

~~Developers should determine if other reliable indicators exist to evaluate the status of this fission product barrier (e.g., review accident analyses described in the site Final Safety Analysis Report, as updated). The goal is to identify any unique or site-specific indications that will promote timely and accurate assessment of barrier status.~~

~~Any added thresholds should represent approximately the same relative threat to the barrier as the other thresholds in this column. Basis information for the other thresholds may be used to gauge the relative barrier threat level.~~

6. **Emergency Director Judgment**

Loss 6.A

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 6.A

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~~ will also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

~~Developer Notes:~~

~~None~~

**107 HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY
ICS/EALS**

Table H-1: Recognition Category "H" Initiating Condition Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
HG1 HOSTILE ACTION resulting in loss of physical control of the facility. <i>Op. Modes: All</i>	HS1 HOSTILE ACTION within the PROTECTED AREA. <i>Op. Modes: All</i>	HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes. <i>Op. Modes: All</i>	HU1 Confirmed SECURITY CONDITION or threat. <i>Op. Modes: All</i>
			HU2 Seismic event greater than OBE levels. <i>Op. Modes: All</i>
			HU3 Hazardous event. <i>Op. Modes: All</i>
			HU4 FIRE potentially degrading the level of safety of the plant. <i>Op. Modes: All</i>
		HA5 Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown. <i>Op. Modes: All</i>	
	HS6 Inability to control a key safety function from outside the Control Room. <i>Op. Modes: All</i>	HA6 Control Room evacuation resulting in transfer of plant control to alternate locations. <i>Op. Modes: All</i>	

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
<p>HG7 Other conditions exist which in the judgment of the emergency director warrant declaration of a General Emergency. <i>Op. Modes: All</i></p>	<p>HS7 Other conditions exist which in the judgment of the emergency director warrant declaration of a Site Area Emergency. <i>Op. Modes: All</i></p>	<p>HA7 Other conditions exist which in the judgment of the emergency director warrant declaration of an Alert. <i>Op. Modes: All</i></p>	<p>HU7 Other conditions exist which in the judgment of the emergency director warrant declaration of a (NO)UE. <i>Op. Modes: All</i></p>

HG1

ECL: General Emergency

Initiating Condition: HOSTILE ACTION resulting in loss of physical control of the facility.

Operating Mode Applicability: All

Emergency Action Levels:

- (1) a. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA (PA) as reported by the Security Shift Captain or designee (~~site-specific security shift supervision~~).
- AND**
- b. **EITHER** of the following has occurred:
1. **ANY** of the following safety functions cannot be controlled or maintained.
 - Reactivity control
 - RPV water level ~~[BWR]~~
 - RCS heat removal
- OR**
2. Damage to spent fuel has occurred or is IMMINENT.

Basis:

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 (OCA)).

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.

PROTECTED AREA (PA): The area that encompasses all controlled areas within the security protected area fence.

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~~ so 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]*.

Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.

Developer Notes:

~~The (site-specific security shift supervision) is the title of the on-shift individual responsible for supervision of the on-shift security force.~~

~~Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate Security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.~~

~~With due consideration given to the above developer note, EALs may contain alpha or numbered references to selected events described in the Security Plan and associated implementing procedures. Such references should not contain a recognizable description of the event. For example, an EAL may be worded as "Security event #2, #5 or #9 is reported by the (site-specific security shift supervision)."~~

~~See the related Developer Note in Appendix B, Definitions, for guidance on the development of a scheme definition for the PROTECTED AREA.~~

~~ECL Assignment Attributes: 3.1.4.D~~

HG7

ECL: General Emergency

Initiating Condition: Other conditions exist which in the judgment of the emergency director warrant declaration of a General Emergency.

Operating Mode Applicability: All

Emergency Action Levels:

- (1) Other conditions exist which in the judgment of the emergency director indicate that events are in progress or have occurred which involve actual or IMMEDIATE 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:

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 (OCA)).

IMMEDIATE: 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.

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist ~~which~~ that are believed by the emergency director to fall under the emergency classification level description for a General Emergency.

HS1

ECL: Site Area Emergency

Initiating Condition: HOSTILE ACTION within the PROTECTED AREA.

Operating Mode Applicability: All

Emergency Action Levels:

- (1) A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA (PA) as reported by the Security Shift Captain or designee (~~site-specific security shift supervision~~).

Basis:

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 (OCA)).

PROTECTED AREA (PA): The area that encompasses all controlled areas within the security protected area fence.

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]*.

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 HA 1. 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, or 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.

Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.

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

Developer Notes:

~~The (site specific security shift supervision) is the title of the on-shift individual responsible for supervision of the on-shift security force.~~

~~Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate Security sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security sensitive information should be contained in non-public documents such as the Security Plan.~~

~~With due consideration given to the above developer note, EALs may contain alpha or numbered references to selected events described in the Security Plan and associated implementing procedures. Such references should not contain a recognizable description of the event. For example, an EAL may be worded as "Security event #2, #5 or #9 is reported by the (site specific security shift supervision)."~~

~~See the related Developer Note in Appendix B, Definitions, for guidance on the development of a scheme definition for the PROTECTED AREA.~~

~~—— ECL Assignment Attributes: 3.1.3.D~~

HS6

ECL: Site Area Emergency

Initiating Condition: Inability to control a key safety function from outside the Control Room.

Operating Mode Applicability: All

Emergency Action Levels:

Note: The emergency director ~~should will~~ declare the Site Area Emergency promptly upon determining that ~~(site specific number of 15 minutes)~~ has been exceeded, or will likely be exceeded.

- (1) a. An event has resulted in plant control being transferred from the control room to ~~remote shutdown panels (site specific remote shutdown panels and local control stations)~~.
- AND**
- b. Control of **ANY** of the following key safety functions is not reestablished within ~~(site specific number of 15 minutes)~~.
- Reactivity control
 - RPV water level ~~{BWR}~~
 - RCS heat removal

Basis:

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 plant control to alternate locations is a precursor to a challenge to one or more fission product barriers within a relatively short period of time.

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 within ~~(the site specific time for transfer)~~ 15 minutes as to 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~~ uses IC FG1 or CG1.

Developer Notes:

~~The "site specific remote shutdown panels and local control stations" are the panels and control stations referenced in plant procedures used to cooldown and shutdown the plant from a location(s) outside the Control Room.~~

~~The "site specific number of minutes" is the time in which plant control must be (or is expected to be) reestablished at an alternate location as described in the site specific fire response analyses. Absent a basis in the site specific analyses, 15 minutes should be used. Another time~~

period may be used with appropriate basis/justification.

ECL Assignment Attributes: 3.1.3.B

HS7

ECL: Site Area Emergency

Initiating Condition: Other conditions exist which in the judgment of the emergency director warrant declaration of a Site Area Emergency.

Operating Mode Applicability: All

Emergency Action Levels:

- (1) Other conditions exist which in the judgment of the emergency director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts, (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

Basis:

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 (OCA)).

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist ~~which~~ that are believed by the emergency director to fall under the emergency classification level description for a Site Area Emergency.

HA1

ECL: Alert

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

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2)

- (1) A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA (OCA) as reported by the Security Shift Captain or designee (~~site-specific security shift supervision~~).
- (2) A validated notification from NRC of an aircraft attack threat within 30 minutes of the site.

Basis:

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 (OCA)).

OWNER CONTROLLED AREA (OCA): The site property owned by or otherwise under the control of HNP Security

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 (PA), or the need to prepare the plant and staff for a potential aircraft impact.

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]*.

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, or 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 is 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.

EAL #2 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 station procedures (site-specific procedure).

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.

Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.

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

Developer Notes:

~~The (site-specific security shift supervision) is the title of the on-shift individual responsible for supervision of the on-shift security force.~~

~~Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate Security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.~~

~~With due consideration given to the above developer note, EALs may contain alpha or numbered references to selected events described in the Security Plan and associated implementing procedures. Such references should not contain a recognizable description of the event. For example, an EAL may be worded as "Security event #2, #5 or #9 is reported by the (site-specific security shift supervision)."~~

~~See the related Developer Note in Appendix B, Definitions, for guidance on the development of a scheme definition for the OWNER CONTROLLED AREA.~~

~~ECL Assignment Attributes: 3.1.2.D~~

HA5

ECL: Alert

Initiating Condition: Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown.

Operating Mode Applicability: All

Emergency Action Levels:

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) a. Release of a toxic, corrosive, asphyxiant or flammable gas into any ~~of the following~~ Table H1 plant rooms or areas:

Table H1		
Building	Rooms	Applicable Modes
Diesel generator building	All	All
	Unit 1/2 130'	All
Reactor building	Unit 1/2 SE Diagonals (RHR)	All
	Unit 1/2 NE Diagonals (RHR)	All

~~———— (site-specific list of plant rooms or areas with entry-related mode applicability identified)~~

AND

- b. Entry into the room or area is prohibited or impeded.

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 ~~plant safety of the plant~~.

An Alert declaration is warranted if entry into the affected room/area is, or may be, procedurally required during the plant operating mode in effect at the time of the gaseous release. 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 environment. This reduces the concentration of oxygen below the normal level of around 19% ~~percent~~, which can lead to breathing difficulties, unconsciousness, or even death.

This EAL does not apply to firefighting activities that automatically or manually activate a fire suppression system in an area, or to intentional inerting of containment ~~(BWR only)~~.

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

Developer Notes:

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

~~The list should 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).~~

~~The list need not include the Control Room if adequate engineered safety/design features are in place to preclude a Control Room evacuation due to the release of a hazardous gas. Such features may include, but are not limited to, capability to draw air from multiple air intakes at different and separate locations, inner and outer atmospheric boundaries, or the capability to acquire and maintain positive pressure within the Control Room envelope.~~

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

~~———— ECL Assignment Attributes: 3.1.2.B~~

HA6

ECL: Alert

Initiating Condition: Control Room evacuation resulting in transfer of plant control to alternate locations.

Operating Mode Applicability: All

Emergency Action Levels:

- (1) An event has resulted in plant control being transferred from the control room to remote shutdown panels ~~(site-specific remote shutdown panels and local control stations)~~.

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 HS6.

Developer Notes:

~~The "site-specific remote shutdown panels and local control stations" are the panels and control stations referenced in plant procedures used to cooldown and shutdown the plant from a location(s) outside the Control Room.~~

—— ECL Assignment Attributes: 3.1.2.B

HA7

ECL: Alert

Initiating Condition: Other conditions exist which in the judgment of the emergency director warrant declaration of an Alert.

Operating Mode Applicability: All

Emergency Action Levels:

- (1) Other conditions exist which, in the judgment of the emergency director, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

Basis:

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 (OCA)).

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist ~~which~~ that are believed by the emergency director to fall under the emergency classification level description for an Alert.

ECL: Notification of Unusual Event

Initiating Condition: Confirmed SECURITY CONDITION or threat.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3)

- (1) A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the Security Shift Captain or designee (~~site-specific security shift supervision~~).
- (2) Notification of a credible security threat directed at ~~the site~~ HNP.
- (3) A validated notification from the NRC providing information of an aircraft threat.

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.

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 (OCA)).

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~~ that 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.

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 references the Security Shift Captain or designee (~~site-specific security shift supervision~~) 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.

EAL #2 addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with ~~station procedures~~(~~site specific procedure~~).

EAL #3 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 ~~station procedures~~(~~site specific procedure~~).

Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.

Escalation of the emergency classification level ~~would be via~~uses IC HA1.

~~Developer Notes:~~

~~The (site specific security shift supervision) is the title of the on-shift individual responsible for supervision of the on-shift security force.~~

~~The (site specific procedure) is the procedure(s) used by Control Room and/or Security personnel to determine if a security threat is credible, and to validate receipt of aircraft threat information.~~

~~Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate Security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.~~

~~With due consideration given to the above developer note, EALs may contain alpha or numbered references to selected events described in the Security Plan and associated implementing procedures. Such references should not contain a recognizable description of the event. For example, an EAL may be worded as "Security event #2, #5 or #9 is reported by the (site specific security shift supervision)."~~

~~———— ECL Assignment Attributes: 3.1.1.A~~

HU2

ECL: Notification of Unusual Event

Initiating Condition: Seismic event greater than OBE levels.

Operating Mode Applicability: All

Emergency Action Levels:

- (1) Seismic event greater than Operating Basis Earthquake (OBE) as indicated by: **ANY** of the following
- Unit One "Seismic Peak Shock Recorder High G Level" (657-066) alarm
 - Unit Two "Seismic Instrumentation Triggered" (657-048) alarm
 - A 12.7 Hz amber light illuminated in the N/S OR E/W column on panel 1H11-P701
 - A 12.7 Hz red light illuminated in the N/S OR E/W column on panel 1H11-P701

—— (site-specific indication that a seismic event met or exceeded OBE limits)

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)⁷. An earthquake greater than an OBE but less than a Safe Shutdown Earthquake (SSE)⁸ 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). 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** plant safety.

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, or check internet news sources, etc.); however, the verification action must not preclude a timely emergency declaration.

Depending upon the plant mode at the time of the event, escalation of the emergency classification level ~~would be via~~ uses IC CA6 or SA9.

Developer Notes:

This "site-specific indication that a seismic event met or exceeded OBE limits" should be based on the indications, alarms and displays of site-specific seismic monitoring equipment.

Indications described in the EAL should be limited to those that are immediately available to Control Room personnel and which can be readily assessed. Indications available outside the

⁷An 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.

⁸An SSE is vibratory ground motion for which certain (generally, safety-related) structures, systems, and components must be designed to remain functional.

Commented [60]: V19 Seismic Indications

Control Room and/or which require lengthy times to assess (e.g., processing of scratch plates or recorded data) should not be used. The goal is to specify indications that can be assessed within 15 minutes of the actual or suspected seismic event.

For sites that do not have readily assessable OBE indications within the Control Room, developers should use the following alternate EAL (or similar wording):

(1) a. Control Room personnel feel an actual or potential seismic event.

————— **AND**

————— b. The occurrence of a seismic event is confirmed in manner deemed appropriate by the Shift Manager or Emergency Director.

The EAL 1.b statement is included to ensure that a declaration does not result from felt vibrations caused by a non-seismic source (e.g., a dropped heavy load). 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. It is recognized that this alternate EAL wording may cause a site to declare an Unusual Event while another site, similarly affected but with readily assessable OBE indications in the Control Room, may not.

The above alternate wording may also be used to develop a compensatory EAL for use during periods when a seismic monitoring system capable of detecting an OBE is out of service for maintenance or repair.

————— ECL Assignment Attributes: 3.1.1.A

HU3

ECL: Notification of Unusual Event

Initiating Condition: Hazardous event.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3 or 4 or 5)

Note: EAL #4 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents.

- (1) A tornado strike within the PROTECTED AREA (PA).
- (2) Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component needed for the current operating mode.
- (3) Movement of personnel within the PROTECTED AREA (PA) is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release).
- (4) A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site ~~via~~ in personal vehicles.
- (5) Sustained hurricane force winds greater than 74 mph forecast to be at the plant site in the next four hours. (~~Site-specific list of natural or technological hazard events~~)

Basis:

PROTECTED AREA (PA): The area which 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.

This IC addresses hazardous events that are considered to represent a potential degradation of the level of ~~plant safety~~ of the plant.

EAL #1 addresses a tornado striking (touching down) within the PROTECTED AREA (PA).

EAL #2 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 addresses a hazardous materials event originating at an offsite location and of sufficient magnitude to impede the movement of personnel within the PROTECTED AREA (PA).

EAL #4 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, ~~ete.~~, 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.

EAL #5 addresses ~~(site-specific description)~~the phenomena of the hurricane based on the severe weather mitigation procedure.;

Escalation of the emergency classification level ~~would be~~ based on ICs in Recognition Categories A, F, S or C.

Developer Notes:

~~The “Site-specific list of natural or technological hazard events” should include other events that may be a precursor to a more significant event or condition, and that are appropriate to the site location and characteristics.~~

~~Notwithstanding the events specifically included as EALs above, a “Site-specific list of natural or technological hazard events” need not include short-lived events for which the extent of the damage and the resulting consequences can be determined within a relatively short time frame. In these cases, a damage assessment can be performed soon after the event, and the plant staff will be able to identify potential or actual impacts to plant systems and structures. This will enable prompt definition and implementation of compensatory or corrective measures with no appreciable increase in risk to the public.~~

~~To the extent that a short-lived event does cause immediate and significant damage to plant systems and structures, it will be classifiable under the Recognition Category F, S and C ICs and EALs. Events of lesser impact would be expected to cause only small and localized damage. The consequences from these types of events are adequately assessed and addressed in accordance with Technical Specifications. In addition, the occurrence or effects of the event may be reportable under the requirements of 10 CFR 50.72.~~

~~—— ECL Assignment Attributes: 3.1.1.A and 3.1.1.C~~

HU4

ECL: Notification of Unusual Event

Initiating Condition: FIRE potentially degrading the level of safety of the plant.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3 or 4)

Note: The emergency director ~~should~~ will declare the Unusual Event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

- (1) a. A FIRE is NOT extinguished within 15-minutes of ANY of the following FIRE detection indications:
- Report from the field (i.e., visual observation)
 - Receipt of multiple (more than 1) fire alarms or indications
 - Field verification of a single fire alarm

AND

- b. The FIRE is located within ANY of the following plant Table H2 rooms or areas:

- (2) a. Receipt of a single fire alarm (i.e., no other indications of a FIRE);

AND

- b. The FIRE is located within ANY of the following plant Table H2 rooms or areas:
~~(site specific list of plant rooms or areas)~~

Commented [61]: V20 Table H2 Basis

AND

- c. The existence of a FIRE is not verified within 30-minutes of alarm receipt.

- (3) A FIRE within the plant PROTECTED AREA (PA) or ISFSI ~~for plants with an ISFSI outside the plant Protected Area~~ PROTECTED AREA not extinguished within 60-minutes of the initial report, alarm or indication.
- (4) A FIRE within the plant PROTECTED AREA (PA) or ISFSI ~~for plants with an ISFSI outside the plant Protected Area~~ PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish.

Table H2	
Building	Rooms
Control Building	CB 147 Cable Spreading Room
	U 1/2 CB 112 Station Battery Rooms A,B
Diesel generator building	All
Primary containment	All
Reactor building	Unit 1/2 130'
	Unit 1/2 SE Diagonals (RHR)
	Unit 1/2 NE Diagonals (RHR)
	Unit 1 SW Diagonals (RCIC)
	Unit 2 NW Diagonals (RCIC)

	Unit 1/2 HPCI Rooms
Intake structure	All

Commented [62]: V20 Table H2 Basis

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 (PA): The area that encompasses all controlled areas within the security protected area fence.

This IC addresses the magnitude and extent of FIRES that may be indicative of a potential degradation of the level of ~~plant safety-of the plant.~~

EAL #1

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, ~~or automatic activation of a suppression system,-ete.~~

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 alarm, indication, or report.

EAL #2

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.

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

In addition to a FIRE addressed by EAL #1 or EAL #2, a FIRE within the plant PROTECTED AREA (PA) 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 (PA). ~~[Sentence for plants with an ISFSI outside the plant Protected Area]~~

EAL #4

If a FIRE within the plant PROTECTED AREA (PA) or ISFSI ~~[for plants with an ISFSI outside the plant Protected Area]~~ 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.

~~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~~ uses IC CA6 or SA9.

Developer Notes:

~~The "site specific list of plant rooms or areas" should specify those rooms or areas that contain SAFETY SYSTEM equipment.~~

~~As noted in the EALs and Basis section, include the term ISFSI if the site has an ISFSI outside the plant Protected Area.~~

— ECL Assignment Attributes: 3.1.1.A

HU7

ECL: Notification of Unusual Event

Initiating Condition: Other conditions exist which in the judgment of the emergency director warrant declaration of a ~~(NO)UE~~ Notification of Unusual Event (NOUE).

Operating Mode Applicability: All

Emergency Action Levels:

- (1) Other conditions exist which in the judgment of the emergency director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

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 a NOUE.

118 SYSTEM MALFUNCTION ICS/EALS

Table S-1: Recognition Category "S" Initiating Condition Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
<p>SG1 Prolonged loss of all offsite and all onsite AC power to emergencyessential buses.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>	<p>SS1 Loss of all offsite and all onsite AC power to emergencyessential buses for 15 minutes or longer.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>	<p>SA1 Loss of all but one AC power source to emergencyessential buses for 15 minutes or longer.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>	<p>SU1 Loss of all offsite AC power capability to emergencyessential buses for 15 minutes or longer.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>
		<p>SA2 UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>	<p>SU2 UNPLANNED loss of Control Room indications for 15 minutes or longer.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>
			<p>SU3 Reactor coolant activity greater than Technical Specification allowable limits.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>
			<p>SU4 RCS leakage for 15 minutes or longer.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>
	<p>SS5 Inability to shutdown the reactor causing a challenge to RPV water level or RCS heat removal.</p> <p><i>Op. Modes: Power Operation</i></p>	<p>SA5 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.</p> <p><i>Op. Modes: Power Operation</i></p>	<p>SU5 Automatic or manual scram fails to shutdown the reactor.</p> <p><i>Op. Modes: Power Operation</i></p>

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
			<p>SU6 Loss of all onsite or offsite communications capabilities.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>
<p>SG8 Loss of all AC and vital DC power sources for 15 minutes or longer.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>	<p>SS8 Loss of all vital DC power for 15 minutes or longer.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>		
		<p>SA9 Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode.</p> <p><i>Op. Modes: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p>	