SG1

ECL: General Emergency

Initiating Condition: Prolonged loss of all offsite and all onsite AC power to ~~emergency~~essential buses.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

Note:	The emergency director ~~should~~ will declare the General Emergency promptly upon determining that ~~(site-specific~~ 4 hours~~)~~ has been exceeded, or will likely be exceeded.

(1) a. Loss of **ALL** offsite and **ALL** onsite AC power to 4160 VAC Essential Buses 1/2E, 1/2F, **AND** 1/2G~~(site-specific emergency buses)~~.

AND

b. **EITHER** of the following:

- Restoration of at least one AC ~~emergency~~essential bus in less than ~~(site-specific~~4 hours~~)~~ is not likely.
- Reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level. ~~(Site-specific indication of an inability to adequately remove heat from the core)~~

Commented [63]: V13 4160 VAC Essential Buses Information

Commented [64]: V21 Minimum Steam Cooling RPV Water Level

Basis:

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

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

Escalation of the emergency classification from Site Area Emergency will occur if it is projected that power cannot be restored to at least one AC ~~emergency~~essential bus by the end of the analyzed station blackout coping period. Beyond this time, plant responses and event trajectory are subject to greater uncertainty, and there is an increased likelihood of challenges to multiple fission product barriers.

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

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

~~**Developer Notes:**~~

~~Although this IC and EAL may be viewed as redundant to the Fission Product Barrier ICs, it is included to provide for a more timely escalation of the emergency classification level.~~

~~The "site-specific emergency buses" are the buses fed by offsite or emergency AC power sources that supply power to the electrical distribution system that powers SAFETY SYSTEMS. There is typically 1 emergency bus per train of SAFETY SYSTEMS.~~

~~The "site-specific hours" to restore AC power to an emergency bus should be based on the station blackout coping analysis performed in accordance with 10 CFR § 50.63 and Regulatory Guide 1.155, *Station Blackout*.~~

~~Site-specific indication of an inability to adequately remove heat from the core:~~

~~[*BWR*] Reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level (as described in the EOP bases).~~

~~[*PWR*] Insert site-specific values for an incore/core exit thermocouple temperature and/or reactor vessel water level that drive entry into a core cooling restoration procedure (or otherwise requires implementation of prompt restoration actions). Alternately, a site may use incore/core exit thermocouple temperatures greater than 1,200°F and/or a reactor vessel water level that corresponds to approximately the middle of active fuel. Plants with reactor vessel level instrumentation that cannot measure down to approximately the middle of active fuel should use the lowest on-scale reading that is not above the top of active fuel. If the lowest on-scale reading is above the top of active fuel, then a reactor vessel level value should not be included.~~

~~For plants that have implemented Westinghouse Owners Group Emergency Response Guidelines, enter the parameters used in the Core Cooling Red Path.~~

~~ECL Assignment Attributes: 3.1.4.B~~

SG8

ECL: General Emergency

Initiating Condition: Loss of all AC and vital DC power sources for 15 minutes or longer.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

Note: The emergency director ~~should~~ will declare the General Emergency promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.

(1) a. Loss of **ALL** offsite and **ALL** onsite AC power to 4160 VAC Essential Buses 1/2E, 1/2F, **AND** 1/2G~~(site-specific emergency buses)~~ for 15 minutes or longer.

AND

b. Indicated voltage is less than 105/210 VDC~~(site-specific bus voltage value)~~ on **ALL** 125/250 VDC Bus 1/2R22-S016 **AND** 1/2R22-S017~~(site-specific Vital DC busses)~~ for 15 minutes or longer.

Commented [65]: V13 4160 VAC Essential Buses Information

Commented [66]: V15 DC System Information

Commented [67]: V15 DC System Information

Basis:

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

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

~~**Developer Notes:**~~

~~The "site-specific emergency buses" are the buses fed by offsite or emergency AC power sources that supply power to the electrical distribution system that powers SAFETY SYSTEMS. There is typically 1 emergency bus per train of SAFETY SYSTEMS.~~

~~The "site-specific bus voltage value" should be based on the minimum bus voltage necessary for adequate operation of SAFETY SYSTEM equipment. This voltage value should incorporate a margin of at least 15 minutes of operation before the onset of inability to operate those loads. This voltage is usually near the minimum voltage selected when battery sizing is performed.~~

~~The typical value for an entire battery set is approximately 105 VDC. For a 60 cell string of batteries, the cell voltage is approximately 1.75 Volts per cell. For a 58 string battery set, the minimum voltage is approximately 1.81 Volts per cell.~~

~~The "site-specific Vital DC busses" are the DC busses that provide monitoring and control capabilities for SAFETY SYSTEMS.~~

~~This IC and EAL were added to Revision 6 to address operating experience from the March, 2011 accident at Fukushima Daiichi.~~

~~ECL Assignment Attributes: 3.1.4.B~~

SS1

ECL: Site Area Emergency

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

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

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

(1) Loss of **ALL** offsite and **ALL** onsite AC power to 4160 VAC Essential Buses 1/2E, 1/2F, AND 1/2G~~(site-specific emergency buses)~~ for 15 minutes or longer.

Commented [68]: V13 4160 VAC Essential Buses Information

Basis:

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

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

Escalation of the emergency classification level ~~would be via~~uses ICs RG1, FG1 or SG1.

~~**Developer Notes:**~~

~~For a power source that has multiple generators, the EAL and/or Basis section should reflect the minimum number of operating generators necessary for that source to provide adequate power to an AC emergency bus. For example, if a backup power source is comprised of two generators (i.e., two 50% capacity generators sized to feed 1 AC emergency bus), the EAL and Basis section must specify that both generators for that source are operating.~~

~~The "site-specific emergency buses" are the buses fed by offsite or emergency AC power sources that supply power to the electrical distribution system that powers SAFETY SYSTEMS. There is typically 1 emergency bus per train of SAFETY SYSTEMS.~~

~~The EAL and/or Basis section may specify use of a non-safety-related power source provided that operation of this source is controlled in accordance with abnormal or emergency operating procedures, or beyond design basis accident response guidelines (e.g., FLEX support guidelines). Such power sources should generally meet the "Alternate ac source" definition provided in 10 CFR 50.2.~~

~~At multi-unit stations, the EALs may credit compensatory measures that are proceduralized and can be implemented within 15 minutes. Consider capabilities such as power source cross-ties, "swing" generators, other power sources described in abnormal or emergency operating procedures, etc. Plants that have a proceduralized capability to supply offsite AC power to an~~

~~affected unit via a cross-tie to a companion unit may credit this power source in the EAL provided that the planned cross-tie strategy meets the requirements of 10 CFR 50.63.~~

~~ECL Assignment Attributes: 3.1.3.B~~

ECL: Site Area Emergency

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

Operating Mode Applicability: Power Operation

Emergency Action Levels:

(1) a. An automatic or manual scram did not shutdown the reactor.

AND

b. All manual actions to shutdown the reactor have been unsuccessful.

AND

c. **EITHER** of the following conditions exist:

- Reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level~~(Site-specific indication of an inability to adequately remove heat from the core)~~
- Exceeding the Heat Capacity Temperature Limit (HCTL) Curve (EOP Graph 2)~~(Site-specific indication of an inability to adequately remove heat from the RCS)~~

Commented [69]: V21 Minimum Steam Cooling RPV Water Level

Commented [70]: V22 Heat Capacity Temperature Limit (HCTL) Curve

Basis:

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

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

A reactor shutdown is determined in accordance with applicable Emergency Operating Procedure criteria.

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

~~**Developer Notes:**~~

~~This IC is applicable in any Mode in which the actual reactor power level could exceed the power level at which the reactor is considered shutdown. A PWR with a shutdown reactor power level that is less than or equal to the reactor power level which defines the lower bound of Power Operation (Mode 1) will need to include Startup (Mode 2) in the Operating Mode Applicability. For example, if the reactor is considered to be shutdown at 3% and Power Operation starts at >5%, then the IC is also applicable in Startup Mode.~~

~~Developers may include site-specific EOP criteria indicative of a successful reactor shutdown in an EAL statement, the Basis or both (e.g., a reactor power level).~~

~~Site-specific indication of an inability to adequately remove heat from the core:~~

~~[*BWR*] - Reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level (as described in the EOP bases).~~

~~[*PWR*] - Insert site-specific values for an incore/core exit thermocouple temperature and/or reactor vessel water level that drives entry into a core cooling restoration procedure (or otherwise requires implementation of prompt restoration actions). Alternately, a site may use incore/core exit thermocouple temperatures greater than 1,200°F and/or a reactor vessel water level that corresponds to approximately the middle of active fuel. Plants with reactor vessel level instrumentation that cannot measure down to approximately the middle of active fuel should use the lowest on-scale reading that is not above the top of active fuel. If the lowest on-scale reading is above the top of active fuel, then a reactor vessel level value should not be included.~~

~~For plants that have implemented Westinghouse Owners Group Emergency Response Guidelines, enter the parameters used in the Core Cooling Red Path.~~

~~Site-specific indication of an inability to adequately remove heat from the RCS:~~

~~[*BWR*] - Use the Heat Capacity Temperature Limit. This addresses the inability to remove heat via the main condenser and the suppression pool due to high pool water temperature.~~

~~[*PWR*] - Insert site-specific parameters associated with inadequate RCS heat removal via the steam generators. These parameters should be identical to those used for the Inadequate Heat Removal threshold Fuel Clad Barrier Potential Loss 2.B and threshold RCS Barrier Potential Loss 2.A in the PWR EAL Fission Product Barrier Table.~~

~~ECL Assignment Attributes: 3.1.3.B~~

ECL: Site Area Emergency

Initiating Condition: Loss of all ~~Vital~~ vital DC power for 15 minutes or longer.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

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

(1) Indicated voltage is less than 105/210 VDC~~(site-specific bus voltage value)~~ on **ALL** 125/250 VDC Bus 1/2R22-S016 **AND** 1/2R22-S017~~(site-specific Vital DC busses)~~ for 15 minutes or longer.

Commented [71]: V15 DC System Information

Commented [72]: V15 DC System Information

Basis:

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

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

Escalation of the emergency classification level ~~would be via~~uses ICs RG1, FG1 or SG8.

~~**Developer Notes:**~~

~~The "site-specific bus voltage value" should be based on the minimum bus voltage necessary for adequate operation of SAFETY SYSTEM equipment. This voltage value should incorporate a margin of at least 15 minutes of operation before the onset of inability to operate those loads. This voltage is usually near the minimum voltage selected when battery sizing is performed.~~

~~The typical value for an entire battery set is approximately 105 VDC. For a 60 cell string of batteries, the cell voltage is approximately 1.75 Volts per cell. For a 58 string battery set, the minimum voltage is approximately 1.81 Volts per cell.~~

~~The "site-specific Vital DC busses" are the DC busses that provide monitoring and control capabilities for SAFETY SYSTEMS.~~

~~ECL Assignment Attributes: 3.1.3.B~~

SA1

ECL: Alert

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

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

Note: The emergency director ~~should~~ will declare the Alert promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.

(1) a. AC power capability to 4160 VAC Essential Buses 1/2E, 1/2F, **AND** 1/2G ~~(site-specific emergency buses)~~ is reduced to a single power source for 15 minutes or longer.

AND

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

Table S1	
Unit 1	**Unit 2**
Start-up Aux XFMR 1C	Start-up Aux XFMR 2C
Start-up Aux XFMR 1D	Start-up Aux XFMR 2D
Diesel Generator 1A	Diesel Generator 2A
Diesel Generator 1B	Diesel Generator 1B
Diesel Generator 1C	Diesel Generator 2C

Commented [73]: V13 4160 VAC Essential Buses Information

Commented [74]: V13 4160 VAC Essential Buses Information

Basis:

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

This IC describes a significant degradation of offsite and onsite AC power sources (see Table S1) such that any additional single failure would result in a loss of all AC power to SAFETY SYSTEMS. In this condition, the sole AC power source may be powering one, or more than one, train of safety-related equipment. This IC provides an escalation path from IC SU1.

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

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

- A loss of ~~emergency~~essential power sources (e.g., onsite diesel generators) with a single train of ~~emergency~~essential buses being back-fed from an offsite power source.

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

Escalation of the emergency classification level ~~would be via~~uses IC SS1.

~~**Developer Notes:**~~

~~For a power source that has multiple generators, the EAL and/or Basis section should reflect the minimum number of operating generators necessary for that source to provide required power to an AC emergency bus. For example, if a backup power source is comprised of two generators (i.e., two 50%-capacity generators sized to feed 1 AC emergency bus), the EAL and Basis section must specify that both generators for that source are operating.~~

~~The "site-specific emergency buses" are the buses fed by offsite or emergency AC power sources that supply power to the electrical distribution system that powers SAFETY SYSTEMS. There is typically 1 emergency bus per train of SAFETY SYSTEMS.~~

~~Developers should modify the bulleted examples provided in the basis section, above, as needed to reflect their site-specific plant designs and capabilities.~~

~~The EALs and Basis should reflect that each independent offsite power circuit constitutes a single power source. For example, three independent 345kV offsite power circuits (i.e., incoming power lines) comprise three separate power sources. Independence may be determined from a review of the site-specific UFSAR, SBO analysis or related loss of electrical power studies.~~

~~The EAL and/or Basis section may specify use of a non-safety-related power source provided that operation of this source is recognized in AOPs and EOPs, or beyond design basis accident response guidelines (e.g., FLEX support guidelines). Such power sources should generally meet the "Alternate ac source" definition provided in 10 CFR 50.2.~~

~~At multi-unit stations, the EALs may credit compensatory measures that are proceduralized and can be implemented within 15 minutes. Consider capabilities such as power source cross-ties, "swing" generators, other power sources described in abnormal or emergency operating procedures, etc. Plants that have a proceduralized capability to supply offsite AC power to an affected unit via a cross-tie to a companion unit may credit this power source in the EAL provided that the planned cross-tie strategy meets the requirements of 10 CFR 50.63.~~

~~ECL Assignment Attributes: 3.1.2.B~~

SA2

ECL: Alert

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

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

Note:	The emergency director ~~should~~ will declare the Alert promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.

(1) a. An UNPLANNED event results in the inability to monitor one or more of the following parameters from within the Control Room for 15 minutes or longer.

Reactor Power
RPV Water Level
RPV Pressure
Primary Containment Pressure
Suppression Pool Level
Suppression Pool Temperature

AND

b. **ANY** of the following transient events in progress.

- Automatic or manual runback greater than 25% thermal reactor power
- Electrical load rejection greater than 25% full electrical load
- Reactor scram
- ECCS ~~(SI)~~ actuation
- Thermal power oscillations greater than 10%

Basis:

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

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

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

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

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

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

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

~~**Developer Notes:**~~

~~In the PWR parameter list column, the "site-specific number" should reflect the minimum number of steam generators necessary for plant cooldown and shutdown. This criterion may also specify whether the level value should be wide-range, narrow-range or both, depending upon the monitoring requirements in emergency operating procedures.~~

~~Developers may specify either pressurizer or reactor vessel level in the PWR parameter column entry for RCS Level.~~

~~Developers should consider if the "transient events" list needs to be modified to better reflect site-specific plant operating characteristics and expected responses.~~

~~The number, type, location and layout of Control Room indications, and the range of possible failure modes, can challenge the ability of an operator to accurately determine, within the time period available for emergency classification assessments, if a specific percentage of indications have been lost. The approach used in this EAL facilitates prompt and accurate emergency classification assessments by focusing on the indications for a selected subset of parameters.~~

~~By focusing on the availability of the specified parameter values, instead of the sources of those values, the EAL recognizes and accommodates the wide variety of indications in nuclear power plant Control Rooms. Indication types and sources may be analog or digital, safety-related or not, primary or alternate, individual meter value or computer group display, etc.~~

~~A loss of plant annunciators will be evaluated for reportability in accordance with 10 CFR 50.72 (and the associated guidance in NUREG-1022), and reported if it significantly impairs the capability to perform emergency assessments. Compensatory measures for a loss of~~

~~annunciation can be readily implemented and may include increased monitoring of main control boards and more frequent plant rounds by non-licensed operators. Their alerting function notwithstanding, annunciators do not provide the parameter values or specific component status information used to operate the plant, or process through AOPs or EOPs. Based on these considerations, a loss of annunciation is considered to be adequately addressed by reportability criteria, and therefore not included in this IC and EAL.~~

~~With respect to establishing event severity, the response to a loss of radiation monitoring data (e.g., process or effluent monitor values) is considered to be adequately bounded by the requirements of 10 CFR 50.72 (and associated guidance in NUREG-1022). The reporting of this event will ensure adequate plant staff and NRC awareness, and drive the establishment of appropriate compensatory measures and corrective actions. In addition, a loss of radiation monitoring data, by itself, is not a precursor to a more significant event.~~

~~Personnel at sites that have a Failure Modes and Effects Analysis (FMEA) included within the design basis of a digital I&C system should consider the FMEA information when developing their site-specific EALs.~~

~~Due to changes in the configurations of SAFETY SYSTEMS, including associated instrumentation and indications, during the cold shutdown, refueling, and defueled modes, no analogous IC is included for these modes of operation.~~

~~ECL Assignment Attributes: 3.1.2.B~~

SA5

ECL: Alert

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

Operating Mode Applicability: Power Operation

Emergency Action Levels:

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

(1) a. An automatic or manual scram did not shutdown the reactor.

AND

b. Manual actions taken at the reactor control consoles are not successful in shutting down the reactor.

Basis:

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

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

Taking the Reactor Mode Switch to SHUTDOWN is considered to be a manual scram action. ~~[*BWR*]~~

The plant response to the failure of an automatic or manual reactor scram will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, other concurrent plant conditions, etc. If the failure to shutdown the reactor is prolonged enough to cause a challenge to the RPV water level or RCS heat removal safety functions, the emergency classification level will escalate to a Site Area Emergency via IC SS5. Depending upon plant responses and symptoms, escalation is also possible via IC FS1. Absent the plant conditions needed to meet either IC SS5 or FS1, an Alert declaration is appropriate for this event.

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

A reactor shutdown is determined in accordance with applicable Emergency Operating Procedure criteria.

~~**Developer Notes:**~~

~~This IC is applicable in any Mode in which the actual reactor power level could exceed the power level at which the reactor is considered shutdown. A PWR with a shutdown reactor power level that is less than or equal to the reactor power level which defines the lower bound of Power Operation (Mode 1) will need to include Startup (Mode 2) in the Operating Mode Applicability. For example, if the reactor is considered to be shutdown at 3% and Power Operation starts at >5%, then the IC is also applicable in Startup Mode.~~

~~Developers may include site-specific EOP criteria indicative of a successful reactor shutdown in an EAL statement, the Basis or both (e.g., a reactor power level).~~

~~The term "reactor control consoles" may be replaced with the appropriate site-specific term (e.g., main control boards).~~

~~ECL Assignment Attributes: 3.1.2.B~~

ECL: Alert

Initiating Condition: Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

(1) a. The occurrence of **ANY** of the following hazardous events:

- Seismic event (earthquake)
- Internal or external flooding event
- High winds or tornado strike
- FIRE
- EXPLOSION
- ~~(site specific hazards)~~
- Other events with similar hazard characteristics as determined by the Shift Manager

AND

b. **EITHER** of the following:

- Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode.
- The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode.

Basis:

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

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

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

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

This IC addresses a hazardous event that causes damage to a SAFETY SYSTEM, or a structure containing SAFETY SYSTEM components, needed for the current operating mode. This condition significantly reduces the margin to a loss or potential loss of a fission product barrier, and therefore represents an actual or potential substantial degradation of the level of plant safety ~~of the plant~~.

EAL 1.a identifies hazardous events that could result in damage to plant systems. A seismic event is indicated by entry into IC HU2. Flooding is indicated by a significant increase in water levels (external or internal). High winds are indicated by sustained winds at the site meteorological tower exceeding 35 mph.

The first threshold for EAL 1.b~~.1~~ addresses damage to a SAFETY SYSTEM train that is in service/operation since indications for it will be readily available. The indications of degraded performance should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

The second threshold for EAL 1.b~~.2~~ addresses damage to a SAFETY SYSTEM component that is not in service/operation or readily apparent through indications alone, or to a structure containing SAFETY SYSTEM components. Operators will make this determination based on the totality of available event and damage report information. This is intended to be a brief assessment not requiring lengthy analysis or quantification of the damage.

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

~~**Developer Notes:**~~

~~For (site-specific hazards), developers should consider including other significant, site-specific hazards to the bulleted list contained in EAL 1.a (e.g., a seiche).~~

~~Nuclear power plant SAFETY SYSTEMS are comprised of two or more separate and redundant trains of equipment in accordance with site-specific design criteria.~~

~~ECL Assignment Attributes: 3.1.2.B~~

SU1

ECL: Notification of Unusual Event

Initiating Condition: Loss of all offsite AC power capability to ~~emergency~~essential buses for 15 minutes or longer.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

Note:	The emergency director ~~should~~ will declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.

(1) Loss of **ALL** offsite AC power capability to 4160 VAC Essential Buses 1/2E, 1/2F, **AND** 1/2G~~(site-specific emergency buses)~~ for 15 minutes or longer.

Commented [75]: V13 4160 VAC Essential Buses Information

Table S2	
Unit 1	**Unit 2**
Start-up Aux XFMR 1C	Start-up Aux XFMR 2C
Start-up Aux XFMR 1D	Start-up Aux XFMR 2D

Commented [76]: V13 4160 VAC Essential Buses Information

Basis:

This IC addresses a prolonged loss of offsite power (see Table S2 above). The loss of offsite power sources renders the plant more vulnerable to a complete loss of power to AC ~~emergency~~essential buses. This condition represents a potential reduction in the level of plant safety~~ of the plant~~.

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

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

Escalation of the emergency classification level ~~would be via~~uses IC SA1.

~~**Developer Notes:**~~

~~The "site-specific emergency buses" are the buses fed by offsite or emergency AC power sources that supply power to the electrical distribution system that powers SAFETY SYSTEMS. There is typically 1 emergency bus per train of SAFETY SYSTEMS.~~

~~At multi-unit stations, the EALs may credit compensatory measures that are proceduralized and can be implemented within 15 minutes. Consider capabilities such as power source cross-ties, "swing" generators, other power sources described in abnormal or emergency operating procedures, etc. Plants that have a proceduralized capability to supply offsite AC power to an affected unit via a cross-tie to a companion unit may credit this power source in the EAL provided that the planned cross-tie strategy meets the requirements of 10 CFR 50.63.~~

~~ECL Assignment Attributes: 3.1.1.A~~

SU2

ECL: Notification of Unusual Event

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

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels:

Note:	The emergency director ~~should~~ will declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.

(1) a. An UNPLANNED event results in the inability to monitor one or more of the following parameters from within the Control Room for 15 minutes or longer.

Reactor Power
RPV Water Level
RPV Pressure
Primary Containment Pressure
Suppression Pool Level
Suppression Pool Temperature

Basis:

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

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

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

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

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

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

Escalation of the emergency classification level ~~would be via~~uses IC SA2.

~~**Developer Notes:**~~

~~In the PWR parameter list column, the "site-specific number" should reflect the minimum number of steam generators necessary for plant cooldown and shutdown. This criterion may also specify whether the level value should be wide-range, narrow-range or both, depending upon the monitoring requirements in emergency operating procedures.~~

~~Developers may specify either pressurizer or reactor vessel level in the PWR parameter column entry for RCS Level.~~

~~The number, type, location and layout of Control Room indications, and the range of possible failure modes, can challenge the ability of an operator to accurately determine, within the time period available for emergency classification assessments, if a specific percentage of indications have been lost. The approach used in this EAL facilitates prompt and accurate emergency classification assessments by focusing on the indications for a selected subset of parameters.~~

~~By focusing on the availability of the specified parameter values, instead of the sources of those values, the EAL recognizes and accommodates the wide variety of indications in nuclear power plant Control Rooms. Indication types and sources may be analog or digital, safety-related or not, primary or alternate, individual meter value or computer group display, etc.~~

~~A loss of plant annunciators will be evaluated for reportability in accordance with 10 CFR 50.72 (and the associated guidance in NUREG-1022), and reported if it significantly impairs the capability to perform emergency assessments. Compensatory measures for a loss of annunciation can be readily implemented and may include increased monitoring of main control boards and more frequent plant rounds by non-licensed operators. Their alerting function notwithstanding, annunciators do not provide the parameter values or specific component status information used to operate the plant, or process through AOPs or EOPs. Based on these considerations, a loss of annunciation is considered to be adequately addressed by reportability criteria, and therefore not included in this IC and EAL.~~

~~With respect to establishing event severity, the response to a loss of radiation monitoring data (e.g., process or effluent monitor values) is considered to be adequately bounded by the requirements of 10 CFR 50.72 (and associated guidance in NUREG-1022). The reporting of this event will ensure adequate plant staff and NRC awareness, and drive the establishment of appropriate compensatory measures and corrective actions. In addition, a loss of radiation monitoring data, by itself, is not a precursor to a more significant event.~~

~~Personnel at sites that have a Failure Modes and Effects Analysis (FMEA) included within the design basis of a digital I&C system should consider the FMEA information when developing their site-specific EALs.~~

~~Due to changes in the configurations of SAFETY SYSTEMS, including associated instrumentation and indications, during the cold shutdown, refueling, and defueled modes, no analogous IC is included for these modes of operation.~~

~~ECL Assignment Attributes: 3.1.1.A~~

SU3

ECL: Notification of Unusual Event

Initiating Condition: Reactor coolant activity greater than Technical Specification allowable limits.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels: (1 or 2)

Note:	Use the Unit 1 or Unit 2 Pretreatment (Flow vs. mR/hr) Graphs to determine if the Pretreatment Radiation Monitor exceeds the TV of 240,000 μCi/sec.

(1) Pretreatment Radiation Monitor
1(2)D11K601
1(2)D11K602~~(Site-specific radiation monitor)~~
reading greater than 240,000 μCi/sec for greater than 60 minutes~~(site-specific value)~~.

Commented [77]: V23 TS 3.7.6 Pretreatment Radiation Monitor Reading

(2) Sample analysis indicates that ~~a~~ the reactor coolant specific activity ~~value~~ is **EITHER:**

- Greater than 0.2 μCi/gm and less than or equal to 2.0 μCi/gm dose equivalent I_{131} for greater than 48 hours
- Greater than 2.0 μCi/gm dose equivalent I_{131}~~greater than an allowable limit specified in Technical Specifications~~.

Commented [78]: V24 TS 3.4.6 RCS Sample Activity

Basis:

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

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

~~**Developer Notes:**~~

~~For EAL #1 – Enter the radiation monitor(s) that may be used to readily identify when RCS activity levels exceed Technical Specification allowable limits. This EAL may be developed using different methods and sites should use existing capabilities to address it (e.g., development of new capabilities is not required). Examples of existing methods/capabilities include:~~

- ~~An installed radiation monitor on the letdown system or air ejector.~~
- ~~A hand-held monitor or deployed detector reading with pre-calculated conversion values or readily implementable conversion calculation capability.~~

~~The monitor reading values should correspond to an RCS activity level approximately at Technical Specification allowable limits.~~

~~If there is no existing method/capability for determining this EAL, then it should not be included. IC evaluation will be based on EAL #2.~~

~~For EAL#2 – Developers may reword the EAL to include the reactor coolant activity parameter(s) specified in Technical Specifications and the associated allowable limit(s) (e.g., values for dose equivalent I-131 and gross activity, time-dependent or transient values, etc.). If this approach is selected, all RCS activity allowable limits should be included.~~

~~ECL Assignment Attributes: 3.1.1.A and 3.1.1.B~~

SU4

ECL: Notification of Unusual Event

Initiating Condition: RCS leakage for 15 minutes or longer.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels: (1 or 2 or 3)

Note:	The emergency director ~~should~~ will declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.

(1) RCS unidentified or pressure boundary leakage greater than ~~(site-specific value)~~10 gpm for 15 minutes or longer.

(2) RCS identified leakage greater than ~~(site-specific value)~~25 gpm for 15 minutes or longer.

(3) Leakage from the RCS to a location outside containment greater than 25 gpm for 15 minutes or longer.

Commented [79]: V25 TS 3.4.4 RCS Operational Leakage

Commented [80]: V25 TS 3.4.4 RCS Operational Leakage

Basis:

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

EAL #1 and EAL #2 are focused on a loss of mass from the RCS due to "unidentified leakage", "pressure boundary leakage" or "identified leakage" (as these leakage types are defined in the plant Technical Specifications). EAL #3 addresses a RCS mass loss caused by an UNISOLABLE leak through an interfacing system. These EALs thus apply to leakage into the containment, a secondary-side system (e.g., steam generator tube leakage in a PWR) or a location outside of containment.

The leak rate values for each EAL were selected because they are usually observable with normal control room indications. Lesser values typically require time-consuming calculations to determine (e.g., a mass balance calculation). EAL #1 uses a lower value that reflects the greater significance of unidentified or pressure boundary leakage.

The release of mass from the RCS due to the as-designed/expected operation of a relief valve does not warrant an emergency classification. A stuck-open Safety Relief Valve (SRV) or SRV leakage is not considered either identified or unidentified leakage by Technical Specifications and, therefore, is not applicable to this EAL.

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

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

~~**Developer Notes:**~~

~~EAL #1 – For the site-specific leak rate value, enter the higher of 10 gpm or the value specified in the site's Technical Specifications for this type of leakage.~~

~~EAL #2 – For the site-specific leak rate value, enter the higher of 25 gpm or the value specified in the site's Technical Specifications for this type of leakage.~~

~~For sites that have Technical Specifications that do not specify a leakage type for steam generator tube leakage, developers should include an EAL for tube leakage greater than 25 gpm for 15 minutes or longer.~~

~~ECL Assignment Attributes: 3.1.1.A~~

SU5

ECL: Notification of Unusual Event

Initiating Condition: Automatic or manual scram fails to shutdown the reactor.

Operating Mode Applicability: Power Operation

Emergency Action Levels: (1 or 2)

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

(1) a. An automatic scram did not shutdown the reactor.

AND

b. A subsequent manual action taken at the reactor control consoles is successful in shutting down the reactor.

(2) a. A manual scram did not shutdown the reactor.

AND

b. **EITHER** of the following:

- A subsequent manual action taken at the reactor control consoles is successful in shutting down the reactor.
- A subsequent automatic scram is successful in shutting down the reactor.

Basis:

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

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

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

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

Taking the Reactor Mode Switch to SHUTDOWN is considered to be a manual scram action.~~.~~ ~~[*BWR*]~~

The plant response to the failure of an automatic or manual reactor scram will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, and other concurrent plant conditions~~, etc~~. If subsequent operator manual actions taken at the reactor control consoles are also unsuccessful in shutting down the reactor, then the emergency classification level will escalate to an Alert via IC SA5. Depending upon the plant response, escalation is also possible via IC FA1. Absent the plant conditions needed to meet either IC SA5 or FA1, an Unusual Event declaration is appropriate for this event.

A reactor shutdown is determined in accordance with applicable Emergency Operating Procedure criteria.

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

- If the signal causes a plant transient that should have included an automatic reactor scram and the RPS fails to automatically shutdown the reactor, then this IC and the EALs are applicable, and ~~should~~ will be evaluated.

- If the signal does not cause a plant transient and the scram failure is determined through other means (e.g., assessment of test results), then this IC and the EALs are not applicable and no classification is warranted.

~~**Developer Notes:**~~

~~This IC is applicable in any Mode in which the actual reactor power level could exceed the power level at which the reactor is considered shutdown. A PWR with a shutdown reactor power level that is less than or equal to the reactor power level which defines the lower bound of Power Operation (Mode 1) will need to include Startup (Mode 2) in the Operating Mode Applicability. For example, if the reactor is considered to be shutdown at 3% and Power Operation starts at >5%, then the IC is also applicable in Startup Mode.~~

~~Developers may include site-specific EOP criteria indicative of a successful reactor shutdown in an EAL statement, the Basis or both (e.g., a reactor power level).~~

~~The term "reactor control consoles" may be replaced with the appropriate site-specific term (e.g., main control boards).~~

~~ECL Assignment Attributes: 3.1.1.A~~

SU6

ECL: Notification of Unusual Event

Initiating Condition: Loss of all onsite or offsite communications capabilities.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Emergency Action Levels: (1 or 2 or 3)

(1) Loss of **ALL** of the following onsite communication methods:

In plant telephones (includes hardwired and wireless)
Plant Page
Plant radio systems

~~(site-specific list of communications methods)~~

(2) Loss of **ALL** of the following ORO communications methods:

ENN (Emergency Notification Network)
Commercial phones

~~(site-specific list of communications methods)~~

(3) Loss of **ALL** of the following NRC communications methods:

ENS on Federal Telephone System (FTS) Lines
Commercial phones

~~(site-specific list of communications methods)~~

Basis:

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

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

EAL #1 addresses a total loss of the communications methods used in support of routine plant operations.

EAL #2 addresses a total loss of the communications methods used to notify all OROs of an emergency declaration. The OROs referred to here are the state of Georgia, Appling County, Jeff Davis County, Tattnall County and Toombs County~~(see Developer Notes)~~.

EAL #3 addresses a total loss of the communications methods used to notify the NRC of an emergency declaration.

~~**Developer Notes:**~~

~~EAL #1 - The "site-specific list of communications methods" should include all communications methods used for routine plant communications (e.g., commercial or site telephones, page-party systems, radios, etc.). This listing should include installed plant equipment and components, and not items owned and maintained by individuals.~~

~~EAL #2 - The "site-specific list of communications methods" should include all communications methods used to perform initial emergency notifications to OROs as described in the site Emergency Plan. The listing should include installed plant equipment and components, and not items owned and maintained by individuals. Example methods are ring-down/dedicated telephone lines, commercial telephone lines, radios, satellite telephones and internet-based communications technology.~~

~~In the Basis section, insert the site-specific listing of the OROs requiring notification of an emergency declaration from the Control Room in accordance with the site Emergency Plan, and typically within 15 minutes.~~

~~EAL #3 - The "site-specific list of communications methods" should include all communications methods used to perform initial emergency notifications to the NRC as described in the site Emergency Plan. The listing should include installed plant equipment and components, and not items owned and maintained by individuals. These methods are typically the dedicated Emergency Notification System (ENS) telephone line and commercial telephone lines.~~

~~ECL Assignment Attributes: 3.1.1.C~~

APPENDIX A – ACRONYMS AND ABBREVIATIONS

AC .... Alternating Current
AOP .... Abnormal Operating Procedure
~~.......... A~~
~~PRM .... Average Power Range Meter~~
ATWS .... Anticipated Transient Without Scram
~~.......... B~~
~~&W .... Babcock and Wilcox~~
~~.......... B~~
~~IIT .... Boron Injection Initiation Temperature~~
BLDG .... Building
BWR .... Boiling Water Reactor
CB .... Control Building
CC .... Cubic Centimeter
CDE .... Committed Dose Equivalent
CFR .... Code of Federal Regulations
~~.......... C~~
~~TMT/CNMT .... Containment~~
~~.......... C~~
~~SF .... Critical Safety Function~~
~~.......... C~~
~~SFST .... Critical Safety Function Status Tree~~
~~.......... D~~
~~BA .... Design Basis Accident~~
CPM .... Counts Per Minute
CPS .... Counts Per Second
DC .... Direct Current
DEI .... Dose Equivalent Iodine
DW .... Drywell
DWRRM .... Drywell Wide Range Rad Monitor
EAL .... Emergency Action Level
ECCS .... Emergency Core Cooling System
ECL .... Emergency Classification Level
~~.......... E~~
~~OF .... Emergency Operations Facility~~
~~.......... E~~
~~OP .... Emergency Operating Procedure~~
ENN .... Emergency Notification Network
ENS .... Emergency Notification System
EPA .... Environmental Protection Agency
EPG .... Emergency Procedure Guideline
~~.......... E~~
~~PIP .... Emergency Plan Implementing Procedure~~
~~.......... E~~
~~PR .... Evolutionary Power Reactor~~
~~.......... E~~
~~PRI .... Electric Power Research Institute~~
~~ERG .... Emergency Response~~
~~Guideline~~FAA .... Federal Aviation Administration

FBI .... Federal Bureau of Investigation
FEMA .... Federal Emergency Management Agency
FSAR .... Final Safety Analysis Report
FTS .... Federal Telecommunications System
GE .... General Emergency
GM .... Gram
HCTL .... Heat Capacity Temperature Limit
HNP .... Hatch Nuclear Plant
HOO .... Headquarters Operations Officer (NRC)
HPCI .... High Pressure Coolant Injection
~~.... H~~
~~SI .... Human System Interface~~
IC .... Initiating Condition
~~.... I~~
~~D .... Inside Diameter~~
~~.... I~~
~~PEEE .... Individual Plant Examination of External Events (Generic Letter 88-20)~~
ISFSI .... Independent Spent Fuel Storage Installation
~~.... K~~
~~eff .... Effective Neutron Multiplication Factor~~
~~.... L~~
~~CO .... Limiting Condition of Operation~~
LOCA .... Loss of Coolant Accident
~~.... M~~
~~CR .... Main Control Room~~
~~.... M~~
~~SIV .... Main Steam Isolation Valve~~
MSL .... Main Steam Line
µCi .... micro-Curie
mR, mRem, mrem, mREM .... milli-Roentgen Equivalent Man
~~.... M~~
~~W .... Megawatt~~
NE .... Northeast
NEI .... Nuclear Energy Institute
NPP .... Nuclear Power Plant
NRC .... Nuclear Regulatory Commission
~~.... N~~
~~SSS .... Nuclear Steam Supply System~~
NORAD .... North American Aerospace Defense Command
(NO)UE .... (Notification Of) Unusual Event
~~.... N~~
~~UMARC~~[9] ~~.... Nuclear Management and Resources Council~~
OBE .... Operating Basis Earthquake
OCA .... Owner Controlled Area
ODCM~~/ODAM~~ .... Offsite Dose Calculation ~~(Assessment)~~ Manual
ORO .... Off-site Response Organization
PA .... Protected Area

[9] ~~NUMARC was a predecessor organization of the Nuclear Energy Institute (NEI).~~

~~...P~~
~~ACS.................................Priority Actuation and Control System~~
PAG.................................Protective Action Guideline
PBX.................................Private Branch Exchange
PCIS.................................Primary Containment Isolation System
~~...P~~
~~ICS.................................Process Information and Control System~~
PRA/PSA ....Probabilistic Risk Assessment / Probabilistic Safety Assessment
~~...P~~
~~WR.................................Pressurized Water Reactor~~
~~...P~~
~~S.................................Protection System~~
PSIG.................................Pounds per Square Inch Gauge
R.................................Roentgen
~~...R~~
~~CC.................................Reactor Control Console~~
RCIC.................................Reactor Core Isolation Cooling
RCS.................................Reactor Coolant System
Rem, rem, REM ....Roentgen Equivalent Man
~~...R~~
~~ETS.................................Radiological Effluent Technical Specifications~~
RHR.................................Residual Heat Removal
RPS.................................Reactor Protection System
RPV.................................Reactor Pressure Vessel
~~...R~~
~~VLIS.................................Reactor Vessel Level Instrumentation System~~
RWCU.................................Reactor Water Cleanup
Rx.................................Reactor
SAG.................................Severe Accident Guideline
SAR.................................Safety Analysis Report
~~...S~~
~~AS.................................Safety Automation System~~
~~...S~~
~~BO.................................Station Blackout~~
SC.................................Secondary Containment
SCBA.................................Self-Contained Breathing Apparatus
~~...S~~
~~G.................................Steam Generator~~
~~...S~~
~~I.................................Safety Injection~~
~~...S~~
~~ICS.................................Safety Information and Control System~~
SE.................................Southeast
SEP.................................Separator
SFP.................................Spent Fuel Pool
SNC.................................Southern Nuclear Company
SPDS.................................Safety Parameter Display System
~~...S~~
~~RO.................................Senior Reactor Operator~~
SW.................................Southwest

TEDE .... Total Effective Dose Equivalent
TOAF .... Top of Active Fuel
TV .... Threshold Value
VAC .... Volts Alternating Current
VDC .... Volts Direct Current
VOIP .... Voice Over Internet Protocol
~~T SC .... Technical Support Center~~
~~W OG .... Westinghouse Owners Group~~

APPENDIX B – DEFINITIONS

The following definitions are taken from Title 10, Code of Federal Regulations, and related regulatory guidance documents.

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

Site Area Emergency: 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 PAG exposure levels beyond the site boundary.

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

Notification of Unusual Event (NOUE)~~[10]~~: 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.

The following are key terms necessary for overall understanding the NEI 99-01 emergency classification scheme.

Emergency Action Level (EAL): A pre-determined, site-specific, observable threshold for an Initiating Condition that, when met or exceeded, places the plant in a given emergency classification level.

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

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

Fission Product Barrier Threshold: A pre-determined, site-specific, observable threshold indicating the loss or potential loss of a fission product barrier.

Initiating Condition (IC): An event or condition that aligns with the definition of one of the four

~~[10] This term is sometimes shortened to Unusual Event (UE) or other similar site-specific terminology.~~

emergency classification levels by virtue of the potential or actual effects or consequences.

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

CONFINEMENT BOUNDARY: The barrier(s) between areas containing radioactive substances and the environment. ~~(Insert a site-specific definition for this term.)~~ ~~**Developer Note** – The barrier(s) between spent fuel and the environment once the spent fuel is processed for dry storage.~~

CONTAINMENT INTEGRITY: Primary Containment OPERABLE per Technical Specification 3.6.1.1. Secondary Containment OPERABLE per Technical Specification 3.6.4.1
~~CONTAINMENT CLOSURE: (Insert a site-specific definition for this term.) **Developer Note** – The procedurally defined conditions or actions taken to secure containment (primary or secondary for BWR) and its associated structures, systems, and components as a functional barrier to fission product release under shutdown conditions.~~

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

~~FAULTED: The term applied to a steam generator that has a steam leak on the secondary side of sufficient size to cause an uncontrolled drop in steam generator pressure or the steam generator to become completely depressurized. **Developer Note** – This term is applicable to PWRs only.~~

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.

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

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

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

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

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

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

OWNER CONTROLLED AREA (OCA): The site property owned by or otherwise under the control of HNP Security.~~(Insert a site-specific definition for this term.) **Developer Note** – This term is typically taken to mean the site property owned by, or otherwise under the control of, the licensee. In some cases, it may be appropriate for a licensee to define a smaller area with a perimeter closer to the plant Protected Area perimeter (e.g., a site with a large OCA where some portions of the boundary may be a significant distance from the Protected Area). In these cases, developers should consider using the boundary defined by the Restricted or Secured Owner Controlled Area (ROCA/SOCA). The area and boundary selected for scheme use must be consistent with the description of the same area and boundary contained in the Security Plan.~~

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

PROTECTED AREA (PA): The area that encompasses all controlled areas within the security protected area fence. ~~(Insert a site-specific definition for this term.) **Developer Note** – This term is typically taken to mean the area under continuous access monitoring and control, and armed protection as described in the site Security Plan.~~

REFUELING PATHWAY: This includes the reactor cavity, the transfer canal, and the spent fuel pool.~~(Insert a site-specific definition for this term.) **Developer Note** – This description should include all the cavities, tubes, canals and pools through which irradiated fuel may be moved, but not including the reactor vessel.~~

~~RUPTURE(D): The condition of a steam generator in which primary-to-secondary leakage is of sufficient magnitude to require a safety injection. **Developer Note** – This term is applicable to PWRs only.~~

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. ~~**Developer Note** – This term may be modified to include the attributes of "safety-related" in accordance with 10 CFR 50.2 or other site-specific terminology, if desired.~~

SECURITY CONDITION: Any Security Event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel, or a potential degradation to the level of safety of the plant. A SECURITY CONDITION does not involve a HOSTILE ACTION.

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

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

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