

## SG1

**ECL:** General Emergency

**Initiating Condition:** Prolonged loss of all offsite and all onsite AC power to emergency 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 ~~(site-specific emergency buses)~~ **BOTH 4160V ESF busses 1(2)F AND 1(2)G.**
- AND**
- b. **EITHER** of the following:
- Restoration of at least one AC emergency bus in less than ~~(site-specific 4 hours)~~ is not likely.
  - **CORE COOLING CSF - RED** conditions met.  
~~(Site-specific indication of an inability to adequately remove heat from the core)~~

Commented [68]: V13 ESF Busses Drawing

Commented [69]: V16 CSFST Information

**Basis:**

This IC addresses a prolonged loss of all power sources to AC emergency busses. 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 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 bus ~~should~~ will be based on a realistic appraisal of the situation. Mitigation actions with a low probability of success ~~should~~ will 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:

[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 **BOTH** 4160V ESF busses 1(2)F AND 1(2)G (~~site-specific emergency busses~~) for 15 minutes or longer.  
**AND**
- b. Indicated voltage is less than (~~site-specific bus voltage value~~) 105 VDC on ALL (~~site-specific Vital 125 VDC DC vital busses~~) for 15 minutes or longer.

Commented [70]: V13 ESF Busses Drawing

Commented [71]: V14 DC Voltage Reference

**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 busses" are the busses 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 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 ~~(site-specific emergency buses)~~ **BOTH** 4160V ESF busses I(2)F **AND** I(2)G for 15 minutes or longer.

**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 a~~ is the 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~~

Commented [72]: V13 ESF Buses Drawing

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

## SS5

**ECL:** Site Area Emergency

**Initiating Condition:** Inability to shutdown the reactor causing a challenge to core cooling or RCS heat removal.

**Operating Mode Applicability:** Power Operation

**Emergency Action Levels:**

**Note:** Heat Sink CSF should not be considered RED if total AFW flow is less than 395 gpm due to operator action.

(1) a. An automatic or manual trip 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:

- Core Cooling CSF - RED conditions met (Site-specific indication of an inability to adequately remove heat from the core)
- Heat Sink CSF - Red conditions met
- ~~(Site-specific indication of an inability to adequately remove heat from the RCS)~~

Commented [73]: V16 CSFST Information

Commented [74]: V16 CSFST Information

**Basis:**

This IC addresses a failure of the RPS to initiate or complete an automatic or manual reactor trip 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 ~~this~~ 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~~ because 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

## SS8

**ECL:** Site Area Emergency

**Initiating Condition:** Loss of all 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 ~~(site-specific bus voltage value)~~ 105 VDC on ALL 125 VDC ~~(site-specific Vital DC vital busses)~~ for 15 minutes or longer.

Commented [75]: V14 DC Voltage Reference

**Basis:**

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

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

Escalation of the emergency classification level ~~would be via~~ 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 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 ~~(site-specific emergency buses)~~ **BOTH** 4160V ESF busses 1(2)F **AND** 1(2)G is reduced to a single power source for 15 minutes or longer.

Commented [76]: V13 ESF Buses Drawing

**AND**

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

Unit 1	Unit 2
Start-up Aux XFMR 1A	Start-up Aux XFMR 2A
Start-up Aux XFMR 1B	Start-up Aux XFMR 2B
Diesel Generator 1-2A	Diesel Generator 1-2A
Diesel Generator 1B	Diesel Generator 2B
Diesel Generator 1C	Diesel Generator 1C
Diesel Generator 2C	Diesel Generator 2C

Commented [77]: V13 ESF Buses Drawing

**Basis:**

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

This IC describes a significant degradation of offsite and onsite AC power sources ~~such that~~ where 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 bus (see Table S1 above). Some examples of this condition are presented below.

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

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

Fifteen minutes ~~was selected as a~~ is the 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
RCS Level
RCS Pressure
In-Core/Core Exit Temperature
Wide Range Levels in at least <del>(site-specific number)</del> one steam generators
Steam Generator Auxiliary or Emergency Feed Water Flow

**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 trip
  - ECCS ~~(SI)~~ actuation

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

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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.

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ECL Assignment Attributes: 3.1.2.B

## SA5

**ECL:** Alert

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

**Operating Mode Applicability:** Power Operation

**Emergency Action Level:**

- (1) a. An automatic or manual trip 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 trip 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~~ ~~that~~ causes the control rods to be rapidly inserted into the core (e.g., initiating a manual reactor trip). 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".

The plant response to the failure of an automatic or manual reactor trip 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 core cooling 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

## SA9

**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**.

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 will** 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 all** 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 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 ~~(site-specific emergency buses)~~ **BOTH** 4160V ESF buses 1(2)F **AND** 1(2)G for 15 minutes or longer.

Table S2	
Unit 1	Unit 2
Start-up Aux XFMR 1A	Start-up Aux XFMR 2A
Start-up Aux XFMR 1B	Start-up Aux XFMR 2B

Commented [78]: V13 ESF Buses Drawing

Commented [79]: V13 ESF Buses Drawing

**Basis:**

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

For emergency classification purposes, "capability" means that an offsite AC power source(s) is available to the emergency buses (see Table S2 above), 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 declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.

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

Reactor Power
RCS Level
RCS Pressure
In-Core/Core Exit Temperature
Wide Range Levels in at least (site-specific number) one steam generators
Steam Generator Auxiliary or Emergency Feed Water Flow

**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~~ reported if it significantly impaired the capability to perform emergency assessments. In particular, emergency assessments necessary to implement abnormal operating procedures, emergency operating procedures, and emergency plan implementing procedures addressing emergency classification, accident assessment, or protective action decision-making.

This EAL is focused on a selected subset of plant parameters associated with the key safety functions of reactivity control, core cooling and RCS heat removal. The loss of the ability to determine one or more of these parameters from within the control room is considered ~~to be~~ more significant than simply a reportable condition. In addition, if all indication sources for one or more of the listed parameters are lost, then the ability to determine the values of other SAFETY SYSTEM parameters may be impacted as well. For example, if the value for reactor vessel level cannot be determined from the indications and recorders on a main control board, the SPDS or the plant computer, ~~then~~ 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 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 of 2)~~

~~(1) — (Site-specific radiation monitor) reading greater than (site-specific value).~~

~~(2)(1) RCS coolant sample activity value indicating fuel clad degradation greater than Technical Specification allowable limits as indicated by ANY of the following:~~

<del>Dose Equivalent I-131 greater than 0.5 <math>\mu\text{Ci/gm}</math> for greater than 48 hours</del>
<del>Dose Equivalent I-131 greater than Technical Specification figure 3.4.16-1.</del>
<del>IF less than 20% power, THEN use the Dose Equivalent I-131 20% power limit on Technical Specification figure 3.4.16-1</del>
<del>RCS gross specific activity greater than <math>100/E</math> <math>\mu\text{Ci/gm}</math>.</del>

~~Sample analysis indicates that a reactor coolant activity value is greater than an allowable limit specified in Technical Specifications.~~

**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.,~~

Commented [80]: V19 RCS Activity Tech Spec

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 [81]: V20 RCS Leakage Tech Spec

Commented [82]: V20 RCS Leakage Tech Spec

### Basis:

This IC addresses RCS leakage ~~which may that~~ could 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. ~~For PWRs, a~~ An emergency classification ~~would be~~ is required if a mass loss is caused by a relief valve that is not functioning as designed/expected (e.g., a relief valve sticks open and the line flow cannot be isolated).

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 trip fails to shutdown the reactor.

**Operating Mode Applicability:** Power Operation

**Emergency Action Levels:** (1 or 2)

- (1) a. An automatic trip 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 trip 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 trip 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 trip that results in a reactor shutdown, and either a subsequent operator manual action taken at the reactor control consoles or an automatic trip 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 trip, operators will promptly initiate manual actions at the reactor control consoles to shutdown the reactor (e.g., initiate a manual reactor trip). 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 trip 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 trip using a different switch). Depending upon several factors, the initial or subsequent effort to manually trip the reactor, or a concurrent plant condition, may lead to the generation of an automatic reactor trip signal. If a subsequent manual or automatic trip 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 that causes the control rods to be rapidly inserted into the core (e.g., initiating a manual reactor trip). 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".

The plant response to the failure of an automatic or manual reactor trip will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, other concurrent plant conditions, etc. If subsequent operator manual actions taken at the reactor 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 trip 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 trip 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 trip 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
Public address system
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 Telecommunications System (FTS)
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~~ will be assessed only when extraordinary means are ~~being utilized~~ used 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 states of Alabama, Georgia, and Florida; Houston and Henry Counties, Alabama; and Early County, Georgia~~ (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

## SU7

ECL: Notification of Unusual Event

**Initiating Condition:** Failure to isolate containment or loss of containment pressure control.  
{PWR}

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

**Emergency Action Levels:** (1 or 2)

- (1) a. Failure of containment to isolate when required by an actuation signal.  
AND  
b. ALL required penetrations are not closed within 15 minutes of the actuation signal.
- (2) a. Containment pressure greater than 27 psig(~~site-specific pressure~~).  
AND  
b. Less than one CTMT fan cooler AND one full train of CTMT spray(~~site-specific system or equipment~~) is operating per design for 15 minutes or longer.

Commented [83]: V21 Containment Spray Initiation Setpoint

### Basis:

This IC addresses a failure of one or more containment penetrations to automatically isolate (close) when required by an actuation signal. It also addresses an event that results in high containment pressure with a concurrent failure of containment pressure control systems. Absent challenges to another fission product barrier, either condition represents potential degradation of the level of plant safety-of the plant.

For EAL #1, the containment isolation signal must be generated as the result on an off-normal/accident condition (e.g., a safety injection or high containment pressure); a failure resulting from testing or maintenance does not warrant classification. The determination of containment and penetration status – isolated or not isolated – ~~should will~~ be made in accordance with the appropriate criteria contained in the plant AOPs and EOPs. The 15-minute criterion is included to allow operators time to manually isolate the required penetrations, if possible.

EAL #2 addresses a condition where containment pressure is greater than the setpoint at which containment energy (heat) removal systems are designed to automatically actuate, and less than one full train of equipment is capable of operating per design. At Farley, a single CTMT fan cooler along with one train of CTMT spray is required per design basis. The 15-minute criterion is included to allow operators time to manually start equipment that may not have automatically started, if possible. The inability to start the required equipment indicates that containment heat removal/depressurization systems (e.g., containment sprays or ice condenser fans) are either lost or performing in a degraded manner.

This event ~~would will~~ escalate to a Site Area Emergency in accordance with IC FS1 if there were a concurrent loss or potential loss of either the Fuel Clad or RCS fission product barriers.

**Developer Notes:**

Enter the "site specific pressure" value that actuates containment pressure control systems (e.g., containment spray). Also enter the site specific containment pressure control system/equipment that should be operating per design if the containment pressure actuation setpoint is reached. If desired, specific condition indications such as parameter values can also be entered (e.g., a containment spray flow rate less than a certain value).

—— EAL #2 is not applicable to the U.S. Evolutionary Power Reactor (EPR) design.

—— ECL Assignment Attributes: 3.1.1.A