

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

ARG1**Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Acton Level (EAL):**Notes:**

- The Emergency Director should declare the ~~General Emergency event~~ promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- ~~Classification based on effluent monitor readings assumes that a release path to the environment is established.~~ If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 (Table R1) should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

~~(1) Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer:~~

~~—(site specific monitor list and threshold values)~~

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

~~(2) Dose assessment using actual meteorology indicates doses greater than 1000mrem TEDE or 5000 mrem thyroid CDE at or beyond (site specific dose receptor point).~~

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

a. > **1000 mRem TEDE**

OR

b. > **5000 mRem CDE Thyroid**

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

OR

~~(3) — Field survey results indicate **EITHER** of the following at or beyond (site specific dose receptor point):~~

- ~~— Closed window dose rates greater than 1,000 mR/hr expected to continue for 60 minutes or longer.~~
- ~~— Analyses of field survey samples indicate thyroid CDE greater than 5,000 mrem for one hour of inhalation.~~

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

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

OR

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

| Table R1 Effluent Monitor Thresholds | |
|---|--------------------------|
| Effluent Monitor | General Emergency |
| Stack | 7880 mR/hr |
| Turb Bldg Exh | 2.44 mR/hr |
| Radw Bldg Exh | 4.74 mR/hr |

Basis:

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

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

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

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

~~Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.~~

Basis Reference(s):

1. EP-EAL-0637, Calculation of FitzPatrick Table R-1 EAL Threshold Values
2. JAFNPP Technical Specifications Section 4.1.1, Figure 4.4-1
3. OP-31 Process Radiation Monitoring Systems
4. DVP-01.02 Offsite Dose Calculation Manual
5. NEI 99-01 Rev 6, AG1

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

ARS1

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Acton Level (EAL):

Notes:

- The Emergency Director should declare the ~~Site Area Emergency event~~ promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- ~~Classification based on effluent monitor readings assumes that a release path to the environment is established.~~ If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 (Table R1) should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

~~(1) Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer:~~

~~(site-specific monitor list and threshold values)~~

~~(2) Dose assessment using actual meteorology indicates doses greater than 100 mrem TEDE or 500 mrem thyroid CDE at or beyond (site-specific dose receptor point).~~

~~(3) Field survey results indicate EITHER of the following at or beyond (site-specific dose receptor point):~~

- ~~Closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer.~~
- ~~Analyses of field survey samples indicate thyroid CDE greater than 500 mrem for one hour of inhalation.~~

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

OR

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

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

a. **> 100 mRem TEDE**

OR

b. **> 500 mRem CDE Thyroid**

OR

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

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

OR

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

| Table R1 Effluent Monitor Thresholds | |
|---|----------------------------|
| Effluent Monitor | Site Area Emergency |
| Stack | 788 mR/hr |
| Turb Bldg Exh | 0.244 mR/hr |
| Radw Bldg Exh | 0.474 mR/hr |

Basis:

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

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

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

~~Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is~~

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

~~no longer valid for classification purposes.~~

Escalation of the emergency classification level would be via IC RAG1.

Basis Reference(s):

1. EP-EAL-0637, Calculation of FitzPatrick Table R-1 EAL Threshold Values
2. JAFNPP Technical Specifications Section 4.1.1, Figure 4.4-1
3. OP-31 Process Radiation Monitoring Systems
4. DVP-01.02 Offsite Dose Calculation Manual
5. NEI 99-01 Rev 6, AS1

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

ARA1

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Acton Level (EAL):

Notes:

- The Emergency Director should declare the **Alert event** promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- **Classification based on effluent monitor readings assumes that a release path to the environment is established.** If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 (**Table R1**) should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

~~(1) — Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer:~~

~~(site-specific monitor list and threshold values)~~

~~(2) — Dose assessment using actual meteorology indicates doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point).~~

~~(3) — Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point) for one hour of exposure.~~

~~(4) — Field survey results indicate **EITHER** of the following at or beyond (site-specific dose receptor point):~~

- ~~• Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer.~~
- ~~• Analyses of field survey samples indicate thyroid CDE greater than 50 mrem for one hour of inhalation.~~

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

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

OR

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

- a. > **10 mRem TEDE**

OR

- b. > **50 mRem CDE Thyroid**

OR

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

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

OR

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

OR

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

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

OR

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

| Table R1 Effluent Monitor Thresholds | |
|---|--------------|
| Effluent Monitor | Alert |
| Stack | 78.8 mr/hr |
| Turb Bldg Exh | N/A |
| Radw Bldg Exh | N/A |

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

Basis:

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

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

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

~~Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.~~

Escalation of the emergency classification level would be via IC RAS1.

Basis Reference(s):

1. EP-EAL-0637, Calculation of FitzPatrick Table R-1 EAL Threshold Values
2. JAFNPP Technical Specifications Section 4.1.1, Figure 4.4-1
3. OP-31 Process Radiation Monitoring Systems
4. DVP-01.02 Offsite Dose Calculation Manual
5. NEI 99-01 Rev 6, AA1

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

ARU1

Initiating Condition:

Release of gaseous or liquid radioactivity greater than 2 times the ~~ODCM (site-specific effluent release controlling document)~~ limits for 60 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Acton Level (EAL):

Notes:

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

~~(1) Reading on ANY effluent radiation monitor greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer:~~

~~(site-specific monitor list and threshold values corresponding to 2 times the controlling document limits)~~

~~(2) Reading on ANY effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.~~

~~(3) Sample analysis for a gaseous or liquid release indicates a concentration or release rate greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer.~~

1. Reading on the Liquid Radwaste Effluent Monitor (17RM-350) > **2 times hi-hi trip for ≥ 60 minutes.**

OR

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

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

| Table R1 Effluent Monitor Thresholds | |
|---|----------------------------------|
| Effluent Monitor | Unusual Event |
| Stack | 0.451 mR/hr (High Range Monitor) |
| Rx Bldg Exh | 9.50E+05 cpm (Low Range Monitor) |
| Turb Bldg Exh | 6.72E+05 cpm (Low Range Monitor) |
| Refuel Floor Exh | 9.28E+05 cpm (Low Range Monitor) |

OR

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

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

Basis:

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

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

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

~~Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.~~

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

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

EAL #1 Basis

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

The effluent monitor listed is normally used for planned discharges.

EAL #2 Basis:

~~EAL #1~~—This EAL addresses normally occurring continuous radioactivity releases from monitored gaseous ~~or liquid~~ effluent pathways.

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

EAL #3 Basis:

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

Escalation of the emergency classification level would be via IC ~~RAA~~1.

Basis Reference(s):

1. EP-EAL-0637, Calculation of FitzPatrick Table R-1 EAL Threshold Values
2. DVP-01.02 Offsite Dose Calculation Manual
3. OP-31 Process Radiation Monitoring Systems
4. NEI 99-01 Rev 6, AU1

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT

ARG2

Initiating Condition:

Spent fuel pool level cannot be restored to at least **1.00 foot** (~~site-specific Level 3 description~~) for 60 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the ~~General Emergency event~~ promptly upon determining that ~~60 minutes~~ the applicable time has been exceeded, or will likely be exceeded.

Spent fuel pool level cannot be restored to at least **1.00 foot** as indicated on 19LI-60A or 19LI-60B (~~site specific Level 3 value~~) for **≥ 60 minutes** ~~or longer~~.

Basis:

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

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

Basis Reference(s):

1. EOP-5 Secondary Containment Control
2. FSG-005, Alternate Spent Fuel Pool Makeup and Cooling
2. NEI 99-01 Rev 6, AG2

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

ARS2

Initiating Condition:

Spent fuel pool level at ~~1.00 foot (site-specific Level 3 description).~~

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Lowering of spent fuel pool level to ~~1.00 foot as indicated on 19LI-60A or 19LI-60B. (site specific Level 3 value).~~

Basis:

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

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

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

Basis Reference(s):

1. EOP-5 Secondary Containment Control
2. FSG-005, Alternate Spent Fuel Pool Makeup and Cooling
3. NEI 99-01 Rev 6, AS2

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

ARA2

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Acton Level (EAL):

~~(1) Uncovery of irradiated fuel in the REFUELING PATHWAY.~~

~~(2) Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** of the following radiation monitors:~~

~~(site specific listing of radiation monitors, and the associated readings, setpoints and/or alarms)~~

~~(3) Lowering of spent fuel pool level to (site specific Level 2 value). [See Developer Notes]~~

1. Uncovery of irradiated fuel in the REFUELING PATHWAY.

OR

2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** Table R2 Radiation Monitor Alarm.

OR

3. Lowering of spent fuel pool level to **11.00 feet** as indicated on 19LI-60A or 19LI-60B.

| Table R2 Refuel Floor Radiation Monitors |
|---|
| <ul style="list-style-type: none"> • 18RIA-051-12 Spent Fuel Pool (EPIC A-1229) • 18RIA-051-14 New Fuel Vault (EPIC A-1231) • 18RIA-052-30 Refuel Floor West (EPIC A-1247) • 17RIS-456A or B Refuel Floor Exhaust |

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

Basis:

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

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

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

This IC addresses events that have caused IMMINENT or actual damage to an irradiated fuel assembly, or a significant lowering of water level within the spent fuel pool. (~~see Developer Notes~~)— These events present radiological safety challenges to plant personnel and are precursors to a release of radioactivity to the environment. As such, they represent an actual or potential substantial degradation of the level of safety of the plant.

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

EAL #1 Basis:EAL #1

This EAL escalates from RAU2 in that the loss of level, in the affected portion of the REFUELING PATHWAY, is of sufficient magnitude to have resulted in uncover of irradiated fuel. Indications of irradiated fuel uncover may include direct or indirect visual observation (e.g., reports from personnel or camera images), as well as significant changes in water and radiation levels, or other plant parameters. Computational aids may also be used (e.g., a boil-off curve). Classification of an event using this EAL should be based on the totality of available indications, reports and observations.

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

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

EAL #2 Basis:

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

EAL #2

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

EAL #3 Basis:**EAL #3**

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

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

~~Escalation of the emergency classification level would be via ICs AS1 or AS2 (see AS2 Developer Notes).~~

Basis Reference(s):

1. EOP-5 Secondary Containment Control
2. OP-32 Area Radiation Monitoring
3. JAFNPNP EPG/SAG
4. FSG-005, Alternate Spent Fuel Pool Makeup and Cooling
5. NEI 99-01 Rev 6, AA2

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

ARU2

Initiating Condition:

UNPLANNED loss of water level above irradiated fuel.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Acton Level (EAL):

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

~~_____ (site specific level indications). _____~~

~~_____ **AND**~~

~~_____ b. UNPLANNED rise in area radiation levels as indicated by ANY of the following radiation monitors.~~

~~_____ (site specific list of area radiation monitors)~~

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

- Inability to restore and maintain Spent Fuel Pool water level > **low water level alarm.**

OR

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

AND

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

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

Table R2 Refuel Floor Radiation Monitors

- 18RIA-051-12 Spent Fuel Pool (EPIC A-1229)
- 18RIA-051-14 New Fuel Vault (EPIC A-1231)
- 18RIA-052-30 Refuel Floor West (EPIC A-1247)
- 17RIS-456A or B Refuel Floor Exhaust

Basis:

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

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

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

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

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

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

Escalation of the emergency classification level would be via IC **RAA2**.

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

Basis Reference(s):

1. AOP-53 Loss of Spent Fuel Pool, Reactor Cavity or Equipment Storage Pit Water Level
2. OP-32 Area Radiation Monitoring
3. OP-30 Fuel Pool Cooling and Cleanup System
4. ARP 09-3-1-9 Fuel Pool Cool & Cln Up Trouble
5. AOP-68 Spent Fuel Pool Trouble
6. NEI 99-01 Rev 6, AU2

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

ARA3

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Acton Level (EAL):

Note:

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

~~(1) Dose rate greater than 15 mR/hr in **ANY** of the following areas:~~

- ~~• Control Room~~
- ~~• Central Alarm Station~~
- ~~• (other site-specific areas/rooms)~~

~~(2) An UNPLANNED event results in radiation levels that prohibit or impede access to any of the following plant rooms or areas:~~

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

1. Dose rate ~~greater than~~ **> 15 mR/hr** in **ANY** of the areas in Table R3.

| Table R3 Areas Requiring Continuous Occupancy |
|---|
| <ul style="list-style-type: none"> • Main Control Room – (by survey) • Central Alarm Station – (by survey) • Secondary Alarm Station – (by survey) |

OR

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

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

| Table R4 Areas with Entry Related Mode Applicability | |
|--|---|
| Area | Entry Related Mode Applicability |
| <ul style="list-style-type: none"> • Reactor Building East Crescent • Reactor Building West Crescent • Reactor Building 272' Elevation • Reactor Building 300' Elevation • Relay Room • North Cable Room | <p>Modes 3, 4, and 5</p> |

Basis:

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

This IC addresses elevated radiation levels in certain plant rooms/areas sufficient to preclude or impede personnel from performing actions necessary to transition the plant from normal plant operation to cooldown and shutdown as specified in normal plant procedures ~~maintain normal plant operation, or to perform a normal plant cooldown and shutdown~~. As such, it represents an actual or potential substantial degradation of the level of safety of the plant. The Emergency Director should consider the cause of the increased radiation levels and determine if another IC may be applicable. **Table R4 is a list of plant rooms or areas with entry-related mode applicability that contain equipment which require a manual/local action necessary to transition the plant from normal plant operation to cooldown and shutdown as specified in normal operating procedures (establish shutdown cooling), where if this action is not completed the plant would not be able to attain and maintain cold shutdown.**

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

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

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

Control Room.

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

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

- The plant is in an operating mode different than the mode specified for the affected room/area (i.e., entry is not required during the operating mode in effect at the time of the elevated radiation levels). For example, the plant is in Mode 1 when the radiation **increases/rise** occurs, and the procedures used for normal operation, cooldown and shutdown do not require entry into the affected room until Mode 4.
- The increased radiation levels are a result of a planned activity that includes compensatory measures which address the temporary inaccessibility of a room or area (e.g., radiography, spent filter or resin transfer, etc.).
- The action for which room/area entry is required is of an administrative or record keeping nature (e.g., normal rounds or routine inspections).
- The access control measures are of a conservative or precautionary nature, and would not actually prevent or impede a required action.

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

Basis Reference(s):

1. JAFNPP Safe Shutdown Analysis
2. NEI 99-01 Rev 6, AA3

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT**

SRU3**Initiating Condition:**

Reactor coolant activity greater than Technical Specification allowable limits.

Operating Mode Applicability:

1, 2, 3

Emergency Acton Level (EAL):

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

~~(2) Sample analysis indicates that a reactor coolant activity value is greater than an allowable limit specified in Technical Specifications.~~

1. Offgas radiation \geq **hi-hi alarm**

OR

2. Specific coolant activity $>$ **2.0 μ Ci/gm I-131** dose equivalent.

Basis:

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

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

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

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

Basis Reference(s):

1. DVP-01.02 Offsite Dose Calculation Manual Specification 3.6.1
2. Technical Specification 3.7.5
3. Technical Specification 3.4.6
4. Technical Specification Bases 3.4.6
5. OP-31 Process Radiation Monitoring
6. NEI 99-01 Rev 6, SU3

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FG1**Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3

Emergency Acton Level (EAL):

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

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.

At the General Emergency classification level each barrier is weighted equally.

Basis Reference(s):

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

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FS1**Initiating Condition:**

Loss or Potential Loss of ANY two barriers.

Operating Mode Applicability:

1, 2, 3

Emergency Acton Level (EAL):

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

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.

At the Site Area Emergency classification level, each barrier is weighted equally.

Basis Reference(s):

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

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FA1**Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3

Emergency Acton Level (EAL):

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

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.

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

Basis Reference(s):

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

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FC1**Initiating Condition:**

RCS Activity

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS

~~A. (Site Specific indications that reactor coolant activity is greater than 300uCi/gm dose equivalent I-131)~~ Coolant activity > **300 uCi/gm** I-131 dose equivalent.

Basis:

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

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

There is no Potential Loss threshold associated with RCS Activity.

Basis Reference(s):

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

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FC2

Initiating Condition:

RPV Water Level

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

~~A.—1.—SAOG entry required. Plant conditions indicate Primary primary containment flooding is required.~~

POTENTIAL LOSS

2. RPV water level **cannot** be restored and maintained **> 0 inches** (TAF).

OR

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

~~A. 2. RPV water level **cannot** be restored and maintained above (site specific RPV water level corresponding to the top of active fuel).~~

or

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

Basis:

RPV values are actual levels, not indicated levels. Therefore, they may need level compensation depending on conditions. Compensated values may be used in accordance with the EOP/SAOG program.

Loss 2.A Threshold #1 Basis

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

Potential Loss 2.A Threshold #2 and #3 Basis:

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

The RPV water level threshold is the same as RCS ~~barrier~~Barrier RC2 Loss threshold ~~2.A~~. Thus, this threshold indicates a Potential Loss of the Fuel Clad barrier and a Loss

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

of the RCS barrier that appropriately escalates the emergency classification level to a Site Area Emergency.

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

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

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

In high-power ATWS/failure to scram events, EOPs may direct the operator to deliberately lower RPV water level ~~to the top of active fuel~~ in order to reduce reactor power. ~~RPV water level is then controlled between the top of active fuel and the Minimum Steam Cooling RPV Water Level (MSCRWL).~~ Although such action is a challenge to core cooling and the Fuel Clad barrier, the immediate need to reduce reactor power is the higher priority. For such events, ICs SA5-MA3 or SS5-MS3 will dictate the need for emergency classification.

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

Basis Reference(s):

1. EP-1 EOP Entry and Use
2. EOP-2 RPV Control
3. EOP-7 RPV Flooding

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

4. EOP-3 Failure to Scram
5. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FC5**Initiating Condition:**

Primary Containment Radiation

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS~~A. Primary containment radiation monitor reading greater than (site-specific value)~~Drywell radiation monitor reading > **1.8 E+03 R/hr (1800 R/hr)**.**Basis:**~~Loss 4.A~~

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

The radiation monitor reading in this threshold is higher than that specified for RCS Barrier ~~RC5~~ Loss ~~Threshold 4.A~~ since it indicates a loss of both the Fuel Clad Barrier and the RCS Barrier. Note that a combination of the two monitor readings appropriately escalates the emergency classification level to a Site Area Emergency.

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

Basis Reference(s):

1. EP-EAL-0715, Criteria for Choosing Containment Radiation values Indicating: loss of fuel clad and potential loss of containment for Fitzpatrick Nuclear Power Station
2. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FC7**Initiating Condition:**

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS

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

POTENTIAL LOSS

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

Basis:**Loss Threshold #1 Basis**Loss 6.A

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

Potential Loss Threshold #2 BasisPotential Loss 6.A

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

Basis Reference(s):

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

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

RC2**Initiating Condition:**

RPV Water Level

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS

1. RPV water level **cannot** be restored and maintained ~~above (site-specific RPV water level corresponding to the top of active fuel)~~ **> 0 inches (TAF)**

-OR

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

Basis:

RPV values are actual levels, not indicated levels. Therefore, they may need level compensation depending on conditions. Compensated values may be used in accordance with the EOP/SAOG program.

Loss 2.A

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

The RPV water level threshold is the same as Fuel Clad ~~barrier-Barrier~~ FC2 Potential Loss threshold ~~2.A~~. Thus, this threshold indicates a Loss of the RCS barrier and Potential Loss of the Fuel Clad barrier and that appropriately escalates the emergency classification level to a Site Area Emergency.

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

The term, "cannot be restored and maintained above," means the value of RPV water level is not able to be brought above the specified limit (top of active fuel). The determination requires an evaluation of system performance and availability in relation

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

to the RPV water level value and trend. A threshold prescribing declaration when a threshold value *cannot* be restored and maintained above a specified limit does not require immediate action simply because the current value is below the top of active fuel, but does not permit extended operation beyond the limit; the threshold must be considered reached as soon as it is apparent that the top of active fuel cannot be attained.

In high-power ATWS/failure to scram events, EOPs may direct the operator to deliberately lower RPV water level ~~to the top of active fuel~~ in order to reduce reactor power. ~~RPV water level is then controlled between the top of active fuel and the Minimum Steam Cooling RPV Water Level (MSCRWL).~~ Although such action is a challenge to core cooling and the Fuel Clad barrier, the immediate need to reduce reactor power is the higher priority. For such events, ICs ~~SA5-MA3~~ or ~~SS5-MS3~~ will dictate the need for emergency classification.

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

Basis Reference(s):

1. EP-1 EOP Entry and Use
2. EOP-2 RPV Control
3. EOP-7 RPV Flooding
4. EOP-3 Failure to Scram
5. TSG-1 Parameter Assessment
6. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

RC3**Initiating Condition:**

Primary Containment Pressure / Conditions

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS

1. a. Primary Containment pressure > 2.7 psig.

AND

b. Primary Containment pressure rise is due to RCS leakage

Basis:Loss 1.A

The ~~(site specific value)~~ > 2.7 psig primary containment pressure is the ~~drywell~~ Drywell high pressure setpoint which indicates a LOCA by automatically initiating ~~the ECCS or equivalent makeup system~~.

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

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

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

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

Basis Reference(s):

1. EP-1 EOP Entry and Use
2. EOP-2 RPV Control
3. EOP-4 Primary Containment Control, Entry Conditions
4. FSAR Update Chapter 6 Emergency Core Cooling Systems
5. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

RC4**Initiating Condition:**

RCS Leak Rate

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS

A1. UNISOLABLE Main Steam Line (MSL), HPCI, RWCU, RCIC, or Feedwater line break. ~~in ANY of the following: (site-specific systems with potential for high energy line breaks)~~

OR

B2. Emergency RPV Depressurization is required.

POTENTIAL LOSS

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

a. Secondary Containment area temperature > **EOP-5 Maximum Normal Operating Limit.**

OR

b. Secondary Containment area radiation > **EOP-5 Maximum Normal Operating Limit.**

~~1. Max **Normal** Operating Temperature~~

OR

~~2. Max **Normal** Operating Area Radiation Level.~~

Basis:

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

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

Classification of a system break over system leakage is based on information available to the Control Room from the event. Indications that should be considered are:

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

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

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

Loss Threshold #1 Basis-3.A

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

Even though RWCU and Feedwater systems do not contain steam, they are included in the list because an UNISOLABLE break could result in the high-pressure discharge of fluid that is flashed to steam from relatively large volume systems directly connected to the RCS.

Loss Threshold #2 Basis-3.B

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

Potential Loss Threshold- #3 Basis 3.A

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

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

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

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

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

steam in the Reactor Building, an unexpected rise in Feedwater flowrate, or unexpected Main Turbine Control Valve closure) may indicate that a primary system is discharging into the Reactor Building.

An UNISOLABLE leak which is indicated by Max Normal Operating values escalates to a Site Area Emergency when combined with Containment Barrier CT6 Loss T_hreshold #13.A (after a containment isolation following automatic or manual isolation) and a General Emergency when the Fuel Clad Barrier criteria is also exceeded.

Basis Reference(s):

1. FM-29A Main Steam System Flow Diagram
2. FM-29B Main Steam System Flow Diagram
3. FM-25A High Pressure Coolant Injection System Flow Diagram
4. FM-22A Reactor Core Isolation Cooling System Flow Diagram
5. FM-34A Feedwater System Flow Diagram
6. EP-1 EOP Entry and Use
7. EOP-2 RPV Control
8. EOP-3 Failure to Scram
9. EOP-4 Primary Containment Control
10. EOP-5 Secondary Containment Control
11. EOP-6 Radioactivity Release Control
12. EOP-7 RPV Flooding
13. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

RC5**Initiating Condition:**

Primary Containment radiation

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS

Drywell radiation monitor reading > 63 R/hr.

~~A. Primary containment radiation reading greater than (site-specific value).~~**Basis:**Loss 4.A

The radiation monitor reading corresponds to an instantaneous release of all reactor coolant mass into the primary containment, assuming that reactor coolant activity equals Technical Specification allowable limits. This value is lower than that specified for Fuel Clad Barrier **FC5** Loss Threshold ~~4.A~~ since it indicates a loss of the RCS Barrier only.

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

Basis Reference(s):

1. EP-EAL-0515, Criteria for Choosing Drywell Radiation Monitor Reading Indicative of Loss of the RCS Barrier for Fitzpatrick Station
2. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

RC7**Initiating Condition:**

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS

A1. Any condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.

POTENTIAL LOSS

A2. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.

Basis:**Loss ~~6.A~~Threshold #1 Basis:**

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

Potential Loss ~~6.A~~Threshold #2 Basis:

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

Basis Reference(s):

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

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

CT2**Initiating Condition:**

RPV Water Level

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:POTENTIAL LOSS

~~A-SAOG entry containment flooding is~~ required.

Basis:Potential Loss 2.A

The Potential Loss threshold is identical to the Fuel Clad ~~Barrier FC2~~ Loss threshold RPV Water Level ~~2.A~~. The Potential Loss requirement for ~~entry into the Severe Accident Procedures (SAOGs) Primary Containment Flooding~~ indicates adequate core cooling cannot be ~~restored and maintained~~ assured and that core damage is possible. ~~BWR EPGs/SAMGs specify the conditions that require primary containment flooding. When primary containment flooding is required, the EPGs are exited and SAMGs are entered.~~ Entry into SAOGMGs is ~~a logical escalation~~ in response to the inability to restore and maintain adequate core cooling.

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

Basis Reference(s):

1. EP-1 EOP Entry and Use
2. EOP-2 RPV Control
3. EOP-3 Failure to Scram
4. EOP-7 RPV Flooding
5. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

CT3

Initiating Condition:

Primary Containment Pressure / Conditions

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

~~A1. UNPLANNED rapid drop in primary containment~~ Primary Containment -pressure following ~~primary containment pressure~~ Primary Containment pressure rise.

OR

~~B2. Primary containment~~ Primary Containment pressure response **not** consistent with LOCA conditions.

POTENTIAL LOSS

~~A3. Primary C~~ontainment pressure ~~greater than (site specific value)~~ **> 56 psig and rising.**

OR

4. a. Primary Containment Hydrogen concentration **$\geq 6\%$.**

AND

b. Primary Containment Oxygen concentration **$\geq 5\%$.**

OR

5. Heat Capacity Temperature Limit (HCTL) (EOP-11) exceeded.

~~B4. (site specific explosive mixture) exists inside primary containment~~

OR

~~C5. HTLC Heat Capacity Temperature Limit exceeded.~~

Basis:

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

Loss 1.A and 1.B Threshold #1 and #2 Basis

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

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

LOCA. Thus, primary containment pressure not increasing under these conditions indicates a loss of primary containment integrity.

These thresholds rely on operator recognition of an unexpected response for the condition and therefore a specific value is not assigned. The unexpected (UNPLANNED) response is important because it is the indicator for a containment bypass condition.

Potential Loss ~~1.A~~Threshold #3 Basis

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

Potential Loss ~~1.B~~Threshold #4 Basis

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

Potential Loss ~~1.C~~Threshold #5 Basis

~~The Heat Capacity Temperature Limit (HCTL) is the highest suppression pool temperature from which Emergency RPV Depressurization will not raise:~~

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

~~OR~~

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

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

Basis Reference(s):

1. FSAR Update Section 5.2.3
2. EOP-4 Primary Containment Control
3. UFSAR 14.6.1.3.3
4. BWROG EPG/SAG Revision 3, Sections PC/G
5. FSAR section 5.2.3.14
6. FSAR Table 7.3-6

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

7. BWROG EPG/SAG Revision 3, Section 18
8. EOP-11 EOP and SAOG Graphs
9. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

CT5**Initiating Condition:**

Primary Containment Radiation

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:POTENTIAL LOSS~~A. Primary containment radiation monitor reading greater than (site-specific value)~~

Drywell radiation monitor reading > 1.8 E+04 R/hr (18,000 R/hr).

Basis:

There is no Loss threshold associated with Primary Containment Radiation.

Potential Loss 4.A

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

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

Basis Reference(s):

1. EP-EAL-0715, Criteria for Choosing Containment Radiation values Indicating: loss of fuel clad and potential loss of containment for Fitzpatrick Nuclear Power Station
2. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

CT6

Initiating Condition:

Primary Containment Isolation Failure

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

A1. UNISOLABLE direct downstream pathway to the environment exists after ~~P~~primary ~~C~~ontainment isolation signal.

OR

B2. Intentional ~~P~~primary ~~C~~ontainment venting or purging per EOPs or SAOGs due to accident conditions.

OR

C3. UNISOLABLE primary system leakage that results in **EITHER** of the following:

a. Secondary Containment area temperature > **EOP-5 Maximum Safe Operating Limit.**

OR

b. Secondary Containment area radiation > **EOP-5 Maximum Safe Operating Limit.**

~~1. Max **Safe Operating temperature.**~~

OR

~~2. Max **Safe Operating Radiation Level**~~

Basis:

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

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

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

Loss ~~3.A~~Threshold #1 Basis

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

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

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

The existence of a filter is not considered in the threshold assessment. Filters do not remove fission product noble gases. In addition, a filter could become ineffective due to iodine and/or particulate loading beyond design limits (i.e., retention ability has been exceeded) or water saturation from steam/high humidity in the release stream.

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

Loss 3.B Threshold #2 Basis

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

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

Loss 3.C Threshold #3 Basis

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

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

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

RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

In combination with RCS Barrier RC4 Potential Loss Threshold #33-A this threshold would result in a Site Area Emergency.

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

Basis Reference(s):

1. EOP-4 Primary Containment Control
2. EP-6 Post accident Containment Venting and Gas Control
3. EP-1 EOP Entry and Use
4. EOP-5 Secondary Containment Control
5. NEI 99-01 Rev 6, Table 9-F-2

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

CT7**Initiating Condition:**

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:LOSS

A1. Any condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.

POTENTIAL LOSS

A2. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.

Basis:**Loss ~~6.A~~Threshold #1 Basis:**

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

Potential Loss ~~6.A~~Threshold #2 Basis:

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

Basis Reference(s):

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

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSG1****Initiating Condition:**

Prolonged loss of all ~~Off-site~~offsite and all ~~On-Site~~onsite AC power to emergency busses.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~General Emergency~~event promptly upon determining that ~~(site-specific hours)~~ the applicable time has been exceeded, or will likely be exceeded.

1-a. Loss of **ALL** offsite and **ALL** on-site AC power to 4160 V emergency buses 10500 and 10600. ~~(site-specific emergency buses).~~

AND

2.3b. **EITHER** of the following:

- a. Restoration of at least one 4160 V emergency bus 10500 or 10600 in **< 4 hours** is not less than ~~(site-specific hours)~~ is not likely.

OR

- b. RPV water level **cannot** be restored and maintained **> -19 inches (MSCRWL)**.
 - ~~(Site-specific indication of an inability to adequately remove heat from the core)~~

Basis:

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

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

RPV values are actual levels, not indicated levels. Therefore, they may need level compensation depending on conditions.

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

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

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

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

If mitigating strategies are effective in reestablishing emergency power to any of the buses listed, within the specified time, then declaration of this EAL is not warranted. This EAL is not concerned with the source of the power as much as the loss of power to the listed buses.

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

Basis Reference(s):

1. Misc. Calculation JAF-CALC-89-012 "Determination of Required SBO Coping Duration Per NUMARC 8700"
2. OP-44 115 KV System
3. Drawing 71-002 AC Distribution
4. OP-46A 4160 VAC and 600 VAC Normal AC Power Distribution
5. OP-22 Diesel Generator Emergency Power
6. OP-45A Backfeeding Normal Station Service Transformer
7. JAFNPP Plant-Specific Technical Guideline (PSTG)
8. EOP-2 RPV Control
9. EOP-7 RPV Flooding
10. AOP-49 Station Blackout
11. NEI 99-01 Rev 6, SG1

RECOGNITION CATEGORY SYSTEM MALFUNCTIONS

MSS1

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the ~~Site Area Emergency event~~ promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.
1. Loss of **ALL** offsite and ~~ALL~~ onsite AC Power to ~~4160 V emergency buses 10500 and 10600. (site-specific emergency buses) for 15 minutes or longer.~~

AND

2. Failure to restore power to at least one 4160 V emergency bus 10500 or 10600 in **< 15 minutes** from the time of loss of both offsite and onsite AC power

Basis:

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

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

If mitigating strategies are effective in reestablishing emergency power to any of the buses listed, within the specified time, then declaration of this EAL is not warranted. This EAL is not concerned with the source of the power as much as the loss of power to the listed buses.

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

Escalation of the emergency classification level would be via ICs RAG1, FG1, ~~or~~ MSG1, or MG2.

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****Basis Reference(s):**

1. OP-44 115 KV System
2. Drawing 71-002 AC Distribution
3. OP-46A 4160 VAC and 600 VAC Normal AC Power Distribution
4. OP-45 345 KV System
5. OP-22 Diesel Generator Emergency Power
6. OP-45A Backfeeding Normal Station Service Transformer
7. AOP-49 Station Blackout
8. NEI 99-01 Rev 6, SS1

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSA1****Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~eventAlert~~ promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.
1. AC power capability to 4160 V emergency buses 10500 and 10600 reduced to only one of the following power sources for **≥ 15 minutes**.
 - Reserve Station Transformer T-2
 - Reserve Station Transformer T-3
 - Station Service Transformer T-4 (While backfeeding from Main Transformer)
 - EDG A
 - EDG B
 - EDG C
 - EDG D
 - Main Generator via T-4
 - ~~a. AC power capability to (site-specific emergency buses) is reduced to a single power source for 15 minutes or longer.~~

AND

- ~~2b. Any-ANY~~ additional single power source failure will result in a loss of ~~all-ALL~~ AC power to SAFETY SYSTEMS.

Basis:

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

This IC describes a significant degradation of offsite and onsite AC power sources such that any additional single failure would result in a loss of all AC power to SAFETY SYSTEMS. In this condition, the sole AC power source may be powering one, or more than one, train of safety-related equipment. This IC provides an escalation path from IC **MSU1**.

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

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

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

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

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

Escalation of the emergency classification level would be via IC MSS1.

Basis Reference(s):

1. OP-44 115 KV System
2. Drawing 71-002 AC Distribution
3. OP-46A 4160 VAC and 600 VAC Normal AC Power Distribution
4. OP-45 345 KV System
5. OP-22 Diesel Generator Emergency Power
6. OP-45A Backfeeding Normal Station Service Transformer
7. NEI 99-01 Rev 6, SA1

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****MSU1****Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~Unusual Event~~ promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.

~~4.~~ Loss of **ALL** offsite AC power capability to ~~4160 V emergency buses 10500 and 10600 (site-specific emergency buses)~~ for **≥ 15 minutes or longer**.

- Reserve Station Transformer T-2
- Reserve Station Transformer T-3
- Station Service Transformer T-4 (While backfeeding from Main Transformer)

Basis:

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

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

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

Escalation of the emergency classification level would be via IC ~~MSA~~1.

Basis Reference(s):

1. OP-44 115 KV System
2. Drawing 71-002 AC Distribution
3. OP-46A 4160 VAC and 600 VAC Normal AC Power Distribution
4. OP-45 345 KV System
5. OP-22 Diesel Generator Emergency Power
6. OP-45A Backfeeding Normal Station Service Transformer

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

7. NEI 99-01 Rev 6, SU1

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSG28****Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~General Emergency~~ event promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.
1. Loss of **ALL** offsite and onsite AC power to 4160 V emergency buses 10500 and 10600.
AND
 2. Voltage is **< 105 VDC** on Vital DC buses 71BCB-2A and 71BCB-2B.
AND
 3. **Conditions** in EALs #1 and #2 have existed for **≥ 15 minutes**.
- ~~1. a. Loss of **ALL** offsite and **ALL** onsite AC power to (site-specific emergency buses) for 15 minutes or longer.~~
- AND**
- ~~— b. Indicated voltage is less than (site specific bus voltage value) on **ALL** (site-specific Vital DC busses) for 15 minutes or longer.~~

Basis:

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

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

If mitigating strategies are effective in reestablishing emergency power to any of the buses listed, within the specified time, then declaration of this EAL is not warranted.

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

This EAL is not concerned with the source of the power as much as the loss of power to the listed buses.

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

Basis Reference(s):

1. OP-44 115 KV System
2. Drawing 71-002 AC Distribution
3. OP-46A 4160 VAC and 600 VAC Normal AC Power Distribution
4. OP-22 Diesel Generator Emergency Power
5. OP-45A Backfeeding Normal Station Service Transformer
6. JAFNPP Plant-Specific Technical Guideline (PSTG)
7. EOP-2 RPV Control
8. EOP-7 RPV Flooding
9. AOP-49 Station Blackout
10. Drawing S71-068
11. OP-43A 125 VDC System
12. ARP 09-8-1-20 125 VDC Batt A Volt Lo
13. ARP 09-8-1-23 125 VDC Batt B Volt Lo
14. AOP-45 Loss of DC Power System 'A'
15. AOP-46 Loss of DC Power System 'B'
16. NEI 99-01 Rev 6, SG8

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****MSS28****Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~Site Area Emergency~~ event promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.

~~Indicated voltage is < 105 VDC less than (site specific bus voltage value) on 71BCB-2A and 71BCB-2B (site specific Vital DC busses) for ≥ 15 minutes or longer.~~

Basis:

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

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

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

Escalation of the emergency classification level would be via ICs RAG1, FG1 or MSG28.

Basis Reference(s):

1. Drawing S71-068
2. OP-43A 125 VDC System
3. ARP 09-8-1-20 125 VDC Batt A Volt Lo
4. ARP 09-8-1-23 125 VDC Batt B Volt Lo
5. AOP-45 Loss of DC Power System 'A'
6. AOP-46 Loss of DC Power System 'B'
7. NEI 99-01 Rev 6, SS8

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSS35****Initiating Condition:**

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

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

1. Automatic scram did **not** shutdown the reactor **as indicated by Reactor Power $\geq 2.5\%$.**

AND

2. **ALL** manual / **ARI** actions to shutdown the reactor have been unsuccessful **as indicated by Reactor Power $\geq 2.5\%$.**

AND

3. EITHER of the following conditions exist:

- RPV water level **cannot** be restored and maintained **> -19 inches (MSCRWL).**
- **OR**
- Heat Capacity Temperature Limit (HCTL) (EOP-11) exceeded.

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

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

Basis:

This IC addresses a failure of the RPS to initiate or complete an automatic or manual reactor scram that results in a reactor shutdown, **all subsequent operator manual actions, both inside and outside the Control Room including driving in control rods and boron injection, 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.

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

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

RPV values are actual levels, not indicated levels. Therefore, they may need level compensation depending on conditions.

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

Escalation of the emergency classification level would be via IC RAG1 or FG1.

Basis Reference(s):

1. FSAR Update Section 7.2
2. EOP-3 Failure to Scram
3. EOP-2 RPV Control
4. EOP-4 Primary Containment Control
5. EOP-7 RPV Flooding
6. EOP-11 EOP and SAOG Graphs
7. NEI 99-01 Rev 6, SS5

RECOGNITION CATEGORY SYSTEM MALFUNCTIONS

MSA35

Initiating Condition:

Automatic or manual scram fails to shutdown the reactor, and subsequent manual actions taken at the ~~R~~reactor ~~C~~ontrol ~~C~~onsoles are not successful in shutting down the reactor.

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

Note:

- A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core. ~~This action and~~ does not include manually driving in control rods or implementation of boron injection strategies.
1. ~~An a~~Automatic or manual scram did not shutdown the reactor ~~as indicated by~~ ~~Reactor Power \geq 2.5%.~~

AND

2. Manual / ~~ARI~~ actions taken at the ~~reactor control consoles~~Reactor Control Console are not successful in shutting down the reactor ~~as indicated by~~ ~~Reactor Power \geq 2.5%.~~

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 ~~R~~reactor ~~C~~ontrol ~~C~~onsoles to ~~rapidly~~ shutdown the reactor are also unsuccessful. This condition represents an actual or potential substantial degradation of the level of safety of the plant. An emergency declaration is required even if the reactor is subsequently shutdown by an action taken away from the ~~R~~reactor ~~C~~ontrol ~~C~~onsoles since this event entails a significant failure of the RPS.

A manual action at the ~~R~~reactor ~~C~~ontrol ~~C~~onsoles 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, ~~ARI~~). 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 ~~R~~reactor ~~C~~ontrol ~~C~~onsoles (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 ~~R~~reactor ~~C~~ontrol ~~C~~onsoles”.

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

The plant response to the failure of an automatic or manual reactor scram will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, other

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

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 MSS35. Depending upon plant responses and symptoms, escalation is also possible via IC FS1. Absent the plant conditions needed to meet either IC MSS35 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.~~

Basis Reference(s):

1. EP-3 Backup Control Rod Insertion
2. EOP-3 Failure to Scram
3. EOP-2 RPV Control
4. NEI 99-01 Rev 6, SA5

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

MSU35

Initiating Condition:

Automatic or manual scram fails to shutdown the reactor.

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

Note:

- A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core. ~~This action~~ **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 **as indicated by Reactor Power $\geq 2.5\%$.**
 - .AND**
 - b. ~~A~~ Subsequent manual / ARI action taken at the ~~reactor control consoles~~ **Reactor Control Console** is successful in shutting down the reactor **as indicated by Reactor Power $< 2.5\%$.**
 - OR**
 2.
 - a. ~~A~~ Manual scram -did **not** shutdown the reactor **as indicated by Reactor Power $\geq 2.5\%$.**
 - AND**
 - b. **EITHER** of the following:
 1. ~~A~~ Subsequent manual / ARI action taken at the ~~reactor control consoles~~ **Reactor Control Console** is successful in shutting down the reactor **as indicated by Reactor Power $< 2.5\%$.**
 - OR**
 2. ~~A~~ Subsequent automatic scram / ARI is successful in shutting down the reactor **as indicated by Reactor Power $< 2.5\%$.**

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 ~~R~~reactor ~~C~~ontrol ~~C~~onsoles or an automatic scram is successful in shutting down the reactor. This event is a precursor to a more significant condition and thus represents a potential degradation of the level of safety of the plant.

EAL #1 Basis

Following the failure on an automatic reactor scram, operators will promptly initiate manual actions at the ~~R~~reactor ~~C~~ontrol ~~C~~onsoles to shutdown the reactor (e.g., initiate a manual reactor scram). If these manual actions are successful in shutting

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

down the reactor, core heat generation will quickly fall to a level within the capabilities of the plant's decay heat removal systems.

EAL #2 Basis

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

A manual action at the **Rreactor Ccontrol Cconsoles** 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 **Rreactor Ccontrol Cconsoles**".

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

The plant response to the failure of an automatic or manual reactor ~~t~~scram will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, other concurrent plant conditions, etc. If subsequent operator manual actions taken at the **Rreactor Ccontrol Cconsoles** are also unsuccessful in shutting down the reactor, then the emergency classification level will escalate to an Alert via IC **MSA35**. Depending upon the plant response, escalation is also possible via IC FA1. Absent the plant conditions needed to meet either IC **MSA35** 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 be applied.

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

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

Basis Reference(s):

1. EP-1 EOP Entry and Use
2. EOP-3 Failure to Scram
3. EOP-2 RPV Control
4. AOP-1 Reactor Scram
5. Technical Specifications section 3.3.1.1 RPS Instrumentation
6. NEI 99-01 Rev 6, SU5

RECOGNITION CATEGORY SYSTEM MALFUNCTIONS

MSA42

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the **eventAlert** promptly upon determining that **the applicable time 15 minutes** has been exceeded, or will likely be exceeded.
1. a. ~~An UNPLANNED event results in the inability to monitor ANY one or more Table M1 of the following parameters~~ from within the Control Room for **≥ 15 minutes or longer**.

[see table below]

| {BWR parameter list} | Table M1 Control Room Parameters |
|---|--|
| Reactor Power | <ul style="list-style-type: none"> • Reactor Power • RPV Water Level • RPV Pressure • Primary Containment Pressure • Torus Level • Torus Temperature |
| RPV Water Level | |
| RPV Pressure | |
| Primary Containment Pressure | |
| Suppression Pool Level | |
| Suppression Pool Temperature | |

AND

- b. ~~Any ANY Table M2 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~~

RECOGNITION CATEGORY SYSTEM MALFUNCTIONS

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

Table M2 Significant Transients

- | |
|---|
| <ul style="list-style-type: none"> • Auto/Manual runback > 25% thermal reactor power • Electric load rejection > 25% full electric load • Reactor scram • ECCS injection • Thermal power oscillations > 10% (peak to peak) |
|---|

Basis:

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

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

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

As used in this EAL, an “inability to monitor” means that values for ~~one or more~~ any of the listed parameters cannot be determined from within the Control Room. This situation would require a loss of all of the Control Room sources for the given parameter(s). For example, the reactor power level cannot be determined from any analog, ~~computer point~~, digital, ~~and~~-recorder source, or equivalent (e.g. camera) 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~~ RPV water level and RCS heat removal.

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

The loss of the ability to determine ~~one or more~~any 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~~any of the listed parameters are lost, then the ability to determine the values of other SAFETY SYSTEM parameters may be impacted as well. For example, if the value for RPV water level cannot be determined from the indications and recorders on a main control board, the SPDS or the plant computer, the availability of other parameter values may be compromised as well.

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

Escalation of the emergency classification level would be via ICs FS1 or IC RAS1.

Basis Reference(s):

1. FSAR Update Section 7.16
2. FSAR Update Section 7.19
3. EOP-2 RPV Control
4. EOP-3 Failure to Scram
5. EOP-4 Primary Containment Control
6. EOP-5 Secondary Containment Control
7. EOP-6 Radioactivity Release Control
8. EOP-7 RPV Flooding
9. NEI 99-01 Rev 6, SA2

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSU42****Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):**Note:**

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

a. An UNPLANNED event results in the inability to monitor ~~one or more~~ ANY Table M1 parameter from within the Control Room for ≥ 15 minutes.

Table M1 Control Room Parameters

- Reactor Power
- RPV Water Level
- RPV Pressure
- Primary Containment Pressure
- Torus Level
- Torus Temperature

~~3. of the following parameters from within the Control Room for 15 minutes or longer.~~

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

| | |
|--|---|
| 4. {BWR parameter list} | 5. {PWR parameter list} |
| 6. Reactor Power 7. | 8. Reactor Power 9. |
| 10. RPV Water Level | 11. RCS Level |
| 12. RPV Pressure | 13. RCS Pressure |
| 14. Primary Containment Pressure | 15. In-Core/Core Exit Temperature |
| 16. Suppression Pool Level | 17. Levels in at least (site-specific number) steam generators |
| 18. Suppression Pool Temperature | 19. 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.

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

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

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

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

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~~ any 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~~ any of the listed parameters are lost, then the ability to determine the values of other SAFETY SYSTEM parameters may be impacted as well. For example, if the value for reactor vessel level cannot be determined from the indications and recorders on a main control board, the SPDS or the plant computer, the availability of other parameter values may be compromised as well.

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

Escalation of the emergency classification level would be via IC ~~MSA42~~.

Basis Reference(s):

1. FSAR Update Section 7.16
2. FSAR Update Section 7.19
3. NEI 99-01 Rev 6, SU2

RECOGNITION CATEGORY SYSTEM MALFUNCTIONS

MSA59

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- If the only affected SAFETY SYSTEM train was already inoperable or out of service before the hazardous event occurred, then this emergency classification is not warranted.
- For SAFETY SYSTEMS with multiple trains if the hazardous event only resulted in VISIBLE DAMAGE or degraded performance to the one train, then this emergency classification is not warranted.
- If it is determined that the conditions of MA5 are not met then assess the event via HU3, HU4, or HU6.

(4) 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

2.b. ~~EITHER~~ of the following:

2. a.4-Event damage has caused indications of degraded performance or VISIBLE DAMAGE to one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode.

~~Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed required by Technical Specifications for the current operating mode.~~

OR-AND

b.2-**ANY** of the following for SAFETY SYSTEMS with multiple trains:

- Event damage has caused indications of degraded performance to a second train of the SAFETY SYSTEM required by Technical Specifications for the current operating mode.

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****OR**

- Event damage has resulted in **VISIBLE DAMAGE** to a second train of the **SAFETY SYSTEM** required by Technical Specifications for the current operating mode.

OR

- An additional train of the **SAFETY SYSTEM** is inoperable or out of service.

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

Basis:

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

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

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 **SAFETY SYSTEM** train 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 **SAFETY SYSTEM** train.

This IC addresses a hazardous event that causes damage to **SAFETY SYSTEMS** required for the current operating mode, "required", i.e. required to be operable by Technical Specifications for the current operating mode. In order to provide the appropriate context for consideration of an Alert classification, the hazardous event must have caused indications of degraded performance or **VISIBLE DAMAGE**. For single train **SAFETY SYSTEMS**, in addition to the occurrence of the hazardous event, only 2.a of this EAL need be satisfied. In **SAFETY SYSTEMS** with multiple trains there must be either indications of degraded performance with the second **SAFETY SYSTEM** train, **VISIBLE DAMAGE** to the second train, or the second train is inoperable or out of service. Note that this second **SAFETY SYSTEM** train is from the same **SAFETY SYSTEM** that has degraded performance or **VISIBLE DAMAGE** for criteria 2.a of this EAL; commercial nuclear power plants are designed to be able to support single system issues without compromising public health and safety from radiological events. Manual or automatic electrical isolation of safety equipment due to flooding, in and of itself, does not constitute degraded performance and is classified under HU6.

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

Indications of degraded performance address 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.

~~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 safety of the plant.~~

~~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.—~~

Operators will make a determination of VISIBLE DAMAGE 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. This VISIBLE DAMAGE should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

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

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

~~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 IC FS1 or AS1.~~

Basis Reference(s):

1. NEI 99-01, Rev 6 SA9

RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSU64****Initiating Condition:**

RCS leakage for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~Unusual Event~~ promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.
1. RCS unidentified or pressure boundary leakage in the Drywell ~~greater than > 10 gpm for \geq 15 minutes. (site-specific value) for 15 minutes or longer.~~
- OR**
2. RCS identified leakage in the Drywell ~~greater than > 25 gpm for \geq 15 minutes. (site-specific value) for 15 minutes or longer.~~
- OR**
3. Leakage from the RCS to a location outside ~~containment~~ the Drywell ~~> 25 gpm for \geq 15 minutes. greater than 25 gpm for 15 minutes or longer.~~

Basis:

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

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

EAL #1 and EAL #2 Basis

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

EAL #3 Basis

~~This EAL~~ addresses a RCS mass loss caused by an UNISOLABLE leak through an interfacing system. ~~The assessment of this EAL may be based on the results of RCS leak rate calculation that may be necessary to ascertain whether the EAL has been exceeded. In this case, the 15-minute declaration period starts with the availability of the RCS leak rate calculation results that show the EAL to be exceeded (i.e., this is the time that the EAL information is first available).~~

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

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. EAL #1 uses a lower value that reflects the greater significance of unidentified or pressure boundary leakage.

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

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

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

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

Basis Reference(s):

1. FSAR Update Section 4.10
2. NEI 99-01 Rev 6, SU4

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

MSU76**Initiating Condition:**

Loss of all ~~on~~On-site or ~~off~~Off-site communications capabilities.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

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

OR

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

OR

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

| Table M3 Communications Capability | | | |
|---|---------------|----------------|------------|
| System | Onsite | Offsite | NRC |
| Page/Party System (Gaitronics) | X | | |
| Control Room/Portable Radio | X | | |
| Plant Telephones (all VOIP, switched, non-switched) | X | X | X |
| Out-of-Plant Cellular Phones | X | X | X |
| Plant Satellite Phones | | X | X |
| RECS | | X | |
| Dedicated Phone Lines (ENS) | | X | X |
| HPN and FTS 2001 | | X | X |

- ~~1. Loss of **ALL** of the following onsite communication methods:~~

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

- ~~2. Loss of **ALL** of the following ORO communications s) methods:~~

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

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

~~3. Loss of ALL of the following NRC communications methods:~~

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

Basis:

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

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

EAL #1 Basis

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

EAL #2 Basis

aAddresses a total loss of the communications methods used to notify all Offsite Response Organizations (OROs) of an emergency declaration. The Offsite Response Organizations (OROs) referred to here are listed in procedure EP-CE-114-100-F-05, JAF Notification Fact Sheet.

~~(see Developer Notes).~~

EAL #3 Basis

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

Basis Reference(s):

1. NY State Emergency Operations Center
2. NY State Warning Point
3. Alternate State Warning Point
4. State Department of Health
5. SEMO Regional Office
6. Oswego County EOC
7. Oswego County E-911 Center (Warning Point)
8. Nine Mile Point Control Rooms
9. Nine Mile Point TSC and EOF

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

10. JAFNPP Control Room
11. JAFNPP TSC
12. JAFNPP EOF
13. SEMO Technical Resources
14. NEI 99-01 Rev 6, SU6

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS****CA12****Initiating Condition:**

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

Operating Mode Applicability:

4, 5, D

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~Alert event~~ promptly upon determining that ~~the applicable time 15 minutes time~~ has been exceeded, or will likely be exceeded.
1. ~~Loss of all offsite and onsite AC power to 4160 V emergency buses 10500 and 10600.~~
- AND**
2. ~~Failure to restore power to at least one 4160 V emergency bus 10500 or 10600 in < 15 minutes from the time of loss of both offsite and onsite AC power.~~

~~Loss of ALL offsite and ALL onsite AC Power to (site specific emergency buses) for 15 minutes or longer.~~

Basis:

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

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

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

If mitigating strategies are effective in reestablishing emergency power to any of the buses listed, within the specified time, then declaration of this EAL is not warranted. This EAL is not concerned with the source of the power as much as the loss of power to the listed buses.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

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

Escalation of the emergency classification level would be via IC CS64 or RAS1.

Basis Reference(s):

1. Drawing 71-002 AC Distribution
2. OP-44 115 KV System
3. OP-45 345 KV System
4. OP-46A 4160 VAC and 600 VAC Normal AC Power Distribution
5. OP-22 Diesel Generator Emergency Power
6. OP-45A Backfeeding Normal Station Service Transformer
7. NEI 99-01 Rev 6, CA2

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU12**Initiating Condition:**

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

Operating Mode Applicability:

4, 5, D

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the **Unusual Event** promptly upon determining that **the applicable time 15 minutes** has been exceeded, or will likely be exceeded.

1. AC power capability to 4.16 kV Emergency Buses reduced to only one of the following power sources for **≥ 15 minutes**.

- Reserve Station Transformer T-2
- Reserve Station Transformer T-3
- Station Service Transformer T-4 (While backfeeding from Main Transformer)
- EDG A
- EDG B
- EDG C
- EDG D

AND

2. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMS.
 - a. ~~AC power capability to (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 loss of all AC power to SAFETY SYSTEMS.~~

Basis:

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

This IC describes a significant degradation of offsite and onsite AC power sources such that any additional single failure would result in a loss of all AC power to SAFETY

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

SYSTEMS. In this condition, the sole AC power source may be powering one, or more than one, train of safety-related equipment.

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

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

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

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

The subsequent loss of the remaining single power source would escalate the event to an Alert in accordance with IC CA12.

Basis Reference(s):

1. OP-44 115 KV System
2. Drawing 71-002 AC Distribution
3. OP-46A 4160 VAC and 600 VAC Normal AC Power Distribution
4. OP-45 345 KV System
5. OP-22 Diesel Generator Emergency Power
6. OP-45A Backfeeding Normal Station Service Transformer
7. NEI 99-01 Rev 6 CU2

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS****CA26****Initiating Condition:**

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

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):**Note:**

- If the only affected SAFETY SYSTEM train was already inoperable or out of service before the hazardous event occurred, then this emergency classification is not warranted.
 - For SAFETY SYSTEMS with multiple trains if the hazardous event only resulted in VISIBLE DAMAGE or degraded performance to the one train, then this emergency classification is not warranted.
 - If it is determined that the conditions of CA2 are not met then assess the event via HU3, HU4, or HU6.
1. The occurrence of **ANY** of the following hazardous events:
- Seismic event (earthquake)
 - Internal or external flooding event
 - High winds or tornado strike
 - FIRE
 - EXPLOSION
 - Other events with similar hazard characteristics as determined by the Shift Manager

AND

2. a. Event damage has caused indications of degraded performance or VISIBLE DAMAGE to one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode.

AND

- b. **ANY** of the following for SAFETY SYSTEMS with multiple trains:

- Event damage has caused indications of degraded performance to a second train of the SAFETY SYSTEM required by Technical Specifications for the current operating mode.

OR

- Event damage has resulted in VISIBLE DAMAGE to a second train of the SAFETY SYSTEM required by Technical Specifications for the current operating mode.

OR

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

- An additional train of the SAFETY SYSTEM is inoperable or out of service.

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:~~

~~1. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode.~~

~~OR~~

~~2. 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 SAFETY SYSTEM train 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 SAFETY SYSTEM train.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

This IC addresses a hazardous event that causes damage to SAFETY SYSTEMS required for the current operating mode, "required", i.e. required to be operable by Technical Specifications for the current operating mode. In order to provide the appropriate context for consideration of an Alert classification, the hazardous event must have caused indications of degraded performance or VISIBLE DAMAGE. For single train SAFETY SYSTEMS, in addition to the occurrence of the hazardous event, only 2.a of this EAL need be satisfied. In SAFETY SYSTEMS with multiple trains there must be either indications of degraded performance with the second SAFETY SYSTEM train, VISIBLE DAMAGE to the second train, or the second train is inoperable or out of service. Note that this second SAFETY SYSTEM train is from the same SAFETY SYSTEM that has degraded performance or VISIBLE DAMAGE for criteria 2.a of this EAL; commercial nuclear power plants are designed to be able to support single system issues without compromising public health and safety from radiological events. Manual or automatic electrical isolation of safety equipment due to flooding, in and of itself, does not constitute degraded performance and is classified under HU6.

Indications of degraded performance address 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.

~~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 safety of the plant.~~

~~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.—~~

Operators will make a determination of VISIBLE DAMAGE 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. This VISIBLE DAMAGE should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

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

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

~~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 IC CS1 or AS1.~~

Basis Reference(s):

RECOGNITION CATEGORY

COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

1. NEI 99-01 Rev 6, CA6

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS**

CU34**Initiating Condition:**

Loss of Vital DC power for 15 minutes or longer.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~Unusual Event~~ promptly upon determining that ~~the applicable time 15 minutes time~~ has been exceeded, or will likely be exceeded.

Voltage is **< 105 VDC** on required Vital DC buses 71BCB-2A and 71BCB-2B for **≥ 15 minutes**.

~~Indicated voltage is less than (site-specific bus voltage value) on required Vital DC buses for 15 minutes or longer.~~

Basis:

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

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

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

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

Depending upon the event, escalation of the emergency classification level would be via IC CA64 or CA53, or an IC in Recognition Category RA.

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS**

Basis Reference(s):

1. Drawing S71-068
2. OP-43A 125 VDC System
3. ARP 09-8-1-20 125 VDC Batt A Volt Lo
4. ARP 09-8-1-23 125 VDC Batt AB Volt Lo
5. AOP-45 Loss of DC Power System 'A'
6. AOP-46 Loss of DC Power System 'B'
7. NEI 99-01 Rev 6, CU4

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS**

CU45**Initiating Condition:**

Loss of all onsite or offsite communications capabilities.

Operating Mode Applicability:

4, 5, D

Emergency Action Level (EAL):

1. Loss of all Table C1 onsite communication capabilities affecting the ability to perform routine operations.

OR

2. Loss of all Table C1 offsite communication capabilities affecting the ability to perform offsite notifications.

OR

3. Loss of all Table C1 NRC communication capabilities affecting the ability to perform NRC notifications.

| Table C1 Communication Capabilities | | | |
|---|---------------|----------------|------------|
| System | Onsite | Offsite | NRC |
| Page/Party System (Gaitronics) | X | | |
| Control Room/Portable Radio | X | | |
| Plant Telephones (all VOIP, switched, non-switched) | X | X | X |
| Out-of-Plant Cellular Phones | X | X | X |
| Plant Satellite Phones | | X | X |
| RECS | | X | |
| Dedicated Phone Lines (ENS) | | X | X |
| HPN and FTS 2001 | | X | X |

- ~~1. Loss of **ALL** of the following onsite communication methods:
(site specific list of communications methods)~~

- ~~2. Loss of **ALL** of the following ORO communications methods:
(site specific list of communications methods)~~

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

~~3. Loss of ALL of the following NRC communications methods:
(site-specific list of communications methods)~~

Basis:

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

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

EAL #1 Basis

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

EAL #2 Basis

~~a~~Addresses a total loss of the communications methods used to notify all Offsite Response Organizations (OROs) of an emergency declaration. The Offsite Response Organizations (OROs) referred to here are listed in procedure EP-CE-114-100-F-05, JAF Notification Fact Sheet.

~~(see Developer Notes).~~

EAL #3 Basis

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

Basis Reference(s):

1. NY State Emergency Operations Center
2. NY State Warning Point
3. Alternate State Warning Point
4. State Department of Health
5. SEMO Regional Office
6. Oswego County EOC
7. Oswego County E-911 Center (Warning Point)
8. Nine Mile Point Control Rooms
9. Nine Mile Point TSC and EOF
10. JAFNPP Control Room

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS**

11. JAFNPP TSC
12. JAFNPP EOF
13. SEMO Technical Resources
14. NEI 99-01 Rev 6, CU5

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS**

CA53**Initiating Condition:**

Inability to maintain the plant in cold shutdown.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):**Note:**

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

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

| Table C2 RCS Heat-up Duration Thresholds | | |
|--|-----------------------------------|-------------------------|
| RCS Status | Containment Closure Status | Heat-up Duration |
| Intact | Not Applicable | 60 minutes* |
| Not Intact | Established | 20 minutes* |
| | Not Established | 0 minutes |
| * If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, then EAL #1 is not applicable. | | |

OR

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

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

~~1. UNPLANNED increase in RCS temperature to greater than (site-specific Technical Specification cold shutdown temperature limit) for greater than the duration specified in the following table.~~

| Table: RCS Heat-up Duration Thresholds | | |
|--|---------------------------------------|-----------------------------|
| RCS Status | Containment Closure Status | Heat-up Duration |
| Intact (but not at reduced inventory [PWR]) | Not applicable | 60 minutes* |
| Not intact (or at reduced inventory [PWR]) | Established | 20 minutes* |
| | Not Established | 0 minutes |
| * If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, the EAL is not applicable. | | |

~~2. UNPLANNED RCS pressure increase greater than (site-specific pressure reading). (This EAL does not apply during water solid plant conditions. [PWR])~~

Basis:

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

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

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

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

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

The RCS Heat-up Duration Thresholds table addresses an ~~increase~~rise in RCS temperature when CONTAINMENT CLOSURE is established but the RCS is not intact, ~~or RCS inventory is reduced (e.g., mid-loop operation in PWRs).~~ The 20-minute criterion was included to allow time for operator action to address the temperature ~~increase~~rise.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

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

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

EAL #2 provides a pressure-based indication of RCS heat-up.

Escalation of the emergency classification level would be via IC CS64 or RAS1.

Basis Reference(s):

1. Technical Specifications Table 1.1-1
2. AOP-30 Loss of Shutdown Cooling
3. OP-13D RHR-Shutdown Cooling
4. Technical Specifications Section 3.61.1 and 3.6.4.1
5. NEI 99-01 Rev 6, CA3

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU53

Initiating Condition:

UNPLANNED ~~increase~~rise in RCS temperature

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the ~~Unusual Event~~event promptly upon determining that ~~the applicable time 15 minutes~~has been exceeded, or will likely be exceeded.
- A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when heat removal function is available does not warrant classification.

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

2. Loss of the following for \geq 15 minutes.

- **ALL** RCS temperature indications

AND

- **ALL** RPV water level indications

~~1. UNPLANNED increase in RCS temperature to greater than (site-specific Technical Specification cold shutdown temperature limit).~~

~~2. Loss of **ALL** RCS temperature and reactor vessel/RCS level indication for 15 minutes or longer.~~

Basis:

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

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

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

This IC addresses an UNPLANNED **increase** in RCS temperature above the Technical Specification cold shutdown temperature limit, or the inability to determine RCS temperature and level, represents a potential degradation of the level of safety of the plant. If the RCS is not intact and CONTAINMENT CLOSURE is not established during this event, the Emergency Director should also refer to IC CA53.

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

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

EAL #1 Basis

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

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

EAL #2 Basis

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

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

Escalation to Alert would be via IC CA64 based on an inventory loss or IC CA53 based on exceeding plant configuration-specific time criteria.

Basis Reference(s):

1. Technical Specifications Table 1.1-1
2. AOP-30 Loss of Shutdown Cooling

RECOGNITION CATEGORY

COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

3. Drawing S02-069
4. NEI 99-01 Rev 6, CU3

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CG61**Initiating Condition:**

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

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~General Emergency event~~ promptly upon determining that ~~the applicable time 30 minutes~~ has been exceeded, or will likely be exceeded.
1.
 - a. RPV water level < **0 inches (TAF)** for **≥ 30 minutes**.

AND

 - b. **Any** Table C4 Containment Challenge Indication.
 - OR**
 2.
 - a. RPV water level cannot be monitored for **≥ 30 minutes**.

AND

 - b. Core uncover is indicated by **ANY** of the following:
 - Table C3 indications of a sufficient magnitude to indicate core uncover.

OR

 2. 18RIA-052-30 Refuel Floor West (EPIC A-1247) Rad monitor **≥ 3 R/hr.**
- AND**
- c. **ANY** Table C4 Containment Challenge Indication.

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS**

| Table C3 Indications of RCS Leakage |
|---|
| <ul style="list-style-type: none"> • UNPLANNED Drywell equipment drain sump level rise* • UNPLANNED Drywell floor drain sump level rise* • UNPLANNED Reactor Building equipment sump level rise* • UNPLANNED Reactor Building floor drain sump level rise* • UNPLANNED Torus level rise* • UNPLANNED RPV make up rate rise* • Observation of leakage or inventory loss |
| *Rise in level is attributed to a loss of RPV inventory. |

| Table C4 Containment Challenge Indications |
|---|
| <ul style="list-style-type: none"> • Primary Containment Hydrogen Concentration $\geq 6\%$ and Oxygen $\geq 5\%$ • UNPLANNED rise in primary containment pressure • CONTAINMENT CLOSURE not established* • Secondary Containment area radiation > ANY Maximum Safe Operating Limit (EOP-5) |
| * If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncover time limit, then escalation to a General Emergency is not required. |

1. ~~a. (Reactor vessel/RCS level less than (site-specific level) for 30 minutes or longer.~~

AND

~~b. ANY indication from the Containment Challenge Table (see below).~~

2. ~~a. Reactor vessel/RCS level cannot be monitored for 30 minutes or longer.~~

AND

~~b. Core uncover is indicated by ANY of the following:~~

- ~~• (Site-specific radiation monitor) reading greater than (site-specific value)~~
- ~~• Erratic source range monitor indication~~

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

- ~~UNPLANNED increase in (site specific sump and/or tank) levels of sufficient magnitude to indicate core uncover~~
- ~~(Other site specific indications)~~

AND

- ~~c. ANY indication from the Containment Challenge Table (see below).~~

| Containment Challenge Table |
|--|
| CONTAINMENT CLOSURE not established* (Explosive mixture) exists inside containment UNPLANNED increase in containment pressure |

~~* If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, then declaration of a General Emergency is not required.~~

Basis:

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

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

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

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

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

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

The existence of an explosive mixture means, at a minimum, that the containment atmospheric hydrogen concentration is sufficient to support a hydrogen burn (i.e., at the

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

lower deflagration limit). A hydrogen burn will raise containment pressure and could result in collateral equipment damage leading to a loss of containment integrity. It therefore represents a challenge to Containment integrity.

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

~~EAL 2.b~~, Basis

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

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

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

Basis Reference(s):

1. BWROG EPG/SAG Revision 2, Sections PC/G
2. EOP-4a Primary Containment Gas Control
3. FSAR section 5.2.3.14
4. FSAR Update Table 5.2-1
5. Technical Support Guideline-1 (TSG-1) Parameter Assessment
6. FSAR Update Section 4.10.3
7. OP-13D RHR-Shutdown Cooling
8. EOP-5 Secondary Containment Control

RECOGNITION CATEGORY

COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

9. Technical Specifications Sections 3.6.1.1 and 3.6.4.1
10. EOP-2 RPV Control
11. EP-EAL-0506 Estimation Of Radiation Monitor Readings Indicating Core Uncovery During Refueling Fitzpatrick Station
12. NEI 99-01 Rev 6, CG1

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CS64

Initiating Condition:

Loss of RPV inventory affecting core decay heat removal capability.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the ~~Site Area Emergency event~~ promptly upon determining that ~~the applicable time 30 minutes~~ has been exceeded, or will likely be exceeded.
1. With CONTAINMENT CLOSURE **not** established, RPV water level **< 120.5 inches**.
OR
 2. With CONTAINMENT CLOSURE established, RPV water level **< 0 inches (TAF)**.
OR
 3. a. RPV water level **cannot** be monitored for **≥ 30 minutes**
AND
 - b. Core uncover is indicated by **ANY** of the following:
 - Table C3 indication of a sufficient magnitude to indicate core uncover.**OR**
 - 18RIA-052-30 Refuel Floor West (EPIC A-1247) Rad monitor **≥ 3 R/hr.**

Table C3 Indications of RCS Leakage

- | |
|---|
| <ul style="list-style-type: none"> • UNPLANNED Drywell equipment drain sump level rise* • UNPLANNED Drywell floor drain sump level rise* • UNPLANNED Reactor Building equipment sump level rise* • UNPLANNED Reactor Building floor drain sump level rise* • UNPLANNED Torus level rise* • UNPLANNED RPV make up rate rise* • Observation of leakage or inventory loss |
|---|

*Rise in level is attributed to a loss of RPV inventory.

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

~~1. a. CONTAINMENT CLOSURE not established.~~

~~**AND**~~

~~b. (Reactor vessel/RCS [*PWR*] or RPV [*BWR*] level less than (site-specific level).~~

~~2. a. CONTAINMENT CLOSURE established.~~

~~**AND**~~

~~b. (Reactor vessel/RCS [*PWR*] or RPV [*BWR*] level less than (site-specific level).~~

~~3. a. (Reactor vessel/RCS [*PWR*] or RPV [*BWR*] level cannot be monitored for 30 minutes or longer.~~

~~**AND**~~

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

- ~~● (Site specific radiation monitor) reading greater than (site specific value)~~
- ~~● Erratic source range monitor indication [*PWR*]~~
- ~~● UNPLANNED increase in (site specific sump and/or tank) levels of sufficient magnitude to indicate core uncover~~
- ~~● (Other site specific indications)~~

Basis:

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

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

~~This IC addresses a significant and prolonged loss of RPV inventory control and makeup capability leading to IMMEDIATE fuel damage.~~ The lost inventory may be due to a RCS component failure, a loss of configuration control or prolonged boiling of reactor coolant. These conditions entail major failures of plant functions needed for protection of the public and thus warrant a Site Area Emergency declaration.

Following an extended loss of core decay heat removal and inventory makeup, decay heat will cause reactor coolant boiling and a further reduction in reactor vessel level. If

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

RCS/reactor vessel level cannot be restored, fuel damage is probable.

Outage/shutdown contingency plans typically provide for re-establishing or verifying CONTAINMENT CLOSURE following a loss of heat removal or RCS inventory control functions. The difference in the specified RCS/reactor vessel levels of EALs ~~#1.b~~ and ~~#2.b~~ reflect the fact that with CONTAINMENT CLOSURE established, there is a lower probability of a fission product release to the environment.

~~In EAL 3.a,~~ **EAL #3 Basis**

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

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

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

Escalation of the emergency classification level would be via IC CG~~46~~ or **ARG1**.

Basis Reference(s):

1. Technical Support Guideline-1 (TSG-1) Parameter Assessment
2. FSAR Update Section 4.10.3
3. OP-13D RHR-Shutdown Cooling
4. EOP-5 Secondary Containment Control
5. Technical Specifications Sections 3.6.1.1 and 3.6.4.1
6. EOP-2 RPV Control
7. EP-EAL-0506 Estimation Of Radiation Monitor Readings Indicating Core Uncovery During Refueling Fitzpatrick Station
8. NEI 99-01 Rev 6, CS1

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CA61

Initiating Condition:

Loss of RPV inventory.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the **event Alert**—promptly upon determining that **the applicable time 15 minutes** has been exceeded, or will likely be exceeded.
1. Loss of RPV inventory as indicated by level < **126.5 inches**.
OR
 2. a. RPV water level **cannot** be monitored for **≥ 15 minutes**.
AND
 - b. Loss of RPV inventory per Table C3 indications.

| Table C3 Indications of RCS Leakage |
|---|
| <ul style="list-style-type: none"> • UNPLANNED Drywell equipment drain sump level rise* • UNPLANNED Drywell floor drain sump level rise* • UNPLANNED Reactor Building equipment sump level rise* • UNPLANNED Reactor Building floor drain sump level rise* • UNPLANNED Torus level rise* • UNPLANNED RPV make up rate rise* • Observation of leakage or inventory loss |
| <p>*Rise in level is attributed to a loss of RPV inventory.</p> |

- ~~1. Loss of reactor vessel/RCS inventory as indicated by level less than (site-specific level).~~
- ~~2. a. Reactor vessel/RCS level cannot be monitored for 15 minutes or longer~~
AND

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

~~— b. — UNPLANNED increase in (site-specific sump and/or tank) levels due to a loss of reactor vessel/RCS inventory.~~

Basis:

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

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

~~For~~ **EAL #1, Basis**

~~a~~A lowering of water level below 126.5 inches (~~site-specific level~~) indicates that operator actions have not been successful in restoring and maintaining RPV water level. The heat-up rate of the coolant will ~~increase~~rise as the available water inventory is reduced. A continuing ~~decrease~~drop in water level will lead to core uncover.

Although related, EAL #1 is concerned with the loss of RCS inventory and not the potential concurrent effects on systems needed for decay heat removal (e.g., loss of a Residual Heat Removal suction point). An ~~increase~~rise in RCS temperature caused by a loss of decay heat removal capability is evaluated under IC CA53.

~~For~~ **EAL #2 Basis**

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

The 15-minute duration for the loss of level indication was chosen because it is half of the EAL duration specified in IC CS64.

If the RPV ~~inventory-water~~ level continues to lower, then escalation to Site Area Emergency would be via IC CS64.

**RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS**

Basis Reference(s):

1. Technical Specifications Table 3.3.5.1.-1
2. Drawing S02-069
3. FSAR Update Section 4.10.3
4. OP-13D RHR-Shutdown Cooling
5. NEI 99-01 Rev 6, CA1

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

CU64

Initiating Condition:

UNPLANNED loss of RPV inventory for 15 minutes or longer.

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- The Emergency Director should declare the ~~Unusual Event~~ promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.
1. UNPLANNED loss of reactor coolant results in the inability to restore and maintain RPV water level to above the **procedurally established lower limit** for **≥ 15 minutes**.
OR
 2. a. RPV water level **cannot** be monitored
AND
 b. Loss of RPV inventory per Table C3 indications.

| Table C3 Indications of RCS Leakage |
|---|
| <ul style="list-style-type: none"> • UNPLANNED Drywell equipment drain sump level rise* • UNPLANNED Drywell floor drain sump level rise* • UNPLANNED Reactor Building equipment sump level rise* • UNPLANNED Reactor Building floor drain sump level rise* • UNPLANNED Torus level rise* • UNPLANNED RPV make up rate rise* • Observation of leakage or inventory loss |
| <p>*Rise in level is attributed to a loss of RPV inventory.</p> |

1. ~~UNPLANNED loss of reactor coolant results in reactor vessel/RCS level less than a required lower limit for 15 minutes or longer.~~
2. a. ~~Reactor vessel/RCS level cannot be monitored.~~
AND
 b. ~~UNPLANNED increase/rise in (site specific sump and/or tank) levels.~~

RECOGNITION CATEGORY
COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

Basis:

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

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

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

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

EAL #1 Basis

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

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

EAL #2 Basis

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

Continued loss of RCS inventory may result in escalation to the Alert emergency classification level via either IC CA64 or CA53.

Basis Reference(s):

1. Drawing S02-069
2. FSAR Update Section 4.10.3
3. OP-13D RHR-Shutdown Cooling

RECOGNITION CATEGORY

COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTIONS

4. Technical Support Guideline-1 (TSG-1) Parameter Assessment
5. OP-65B Shutdown Operation
6. EOP-2 RPV Control
7. NEI 99-01, Rev. 6 CU1

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HG1**Initiating Condition:**

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

Operating Mode Applicability:

All

Emergency Action Level (EAL):

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

AND

~~b. EITHER of the following has occurred:~~

~~1. ANY of the following safety functions cannot be controlled or maintained:~~

- ~~● Reactivity control~~
- ~~● Core cooling [*PWR*] / RPV water level [*BWR*]~~
- ~~● RCS heat removal~~

OR

~~2. Damage to spent fuel has occurred or is IMMINENT.~~

Basis:

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

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

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

~~Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate Security-sensitive information. This includes information that~~

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

~~may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.~~

~~Basis Reference(s):~~

- ~~1. NEI 99-01, Rev. 6 HG1~~

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY****HS1****Initiating Condition:**

HOSTILE ACTION within the PROTECTED AREA.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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

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

Basis:

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

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

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

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

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

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

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

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

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

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

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

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

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

Escalation of the emergency classification level would be via IC **RG1, RG2, HG7.HG4**.

Basis Reference(s):

1. JAFNPP Safeguards Contingency Plan
2. AOP-70 Security Threat
3. NEI 99-01 Rev 6, HS1

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HA1**Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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

~~1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the (site specific security shift supervision).~~

OR

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

~~A validated notification from NRC of an aircraft attack threat within 30 minutes of the site.~~

Basis:

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

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

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

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

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

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

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

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

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

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

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

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

EAL #1 Basis

Addresses the threat from the impact of an aircraft on the plant, and the anticipated arrival time is within 30 minutes. The intent of this EAL is to ensure that threat-related notifications are made in a timely manner so that plant personnel and OROs are in a heightened state of readiness. This EAL is met when the threat-related information has been validated in accordance with AOP-70, Airborne Security.

EAL #2 Basis

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

~~EAL #2 addresses the threat from the impact of an aircraft on the plant, and the anticipated arrival time is within 30 minutes. The intent of this EAL is to ensure that threat-related notifications are made in a timely manner so that plant personnel and~~

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

~~OROs are in a heightened state of readiness. This EAL is met when the threat-related information has been validated in accordance with (site-specific procedure).~~

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

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

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

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

Basis Reference(s):

1. JAFNPP Safeguards Contingency Plan
2. AOP-70 Security Threat
3. NEI 99-01 Rev 6, HA1

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY****HU1****Initiating Condition:**

Confirmed SECURITY CONDITION or threat.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities.
- ~~1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the (site-specific security shift supervision).~~

OR

2. A validated notification from the NRC providing information of an aircraft threat.
- ~~2. Notification of a credible security threat directed at the site.~~

OR

3. Notification by the Security Force of a SECURITY CONDITION that does **not** involve a HOSTILE ACTION.
- ~~3. A validated notification from the NRC providing information of an aircraft threat.~~

Basis:

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

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

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

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

RECOGNITION CATEGORY**HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

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

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

Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event. Classification of these events will initiate appropriate threat-related notifications to plant personnel and **Offsite Response Organizations (OROs)**.

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

EAL #1 Basis

~~Addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with SY-AA-101-132, Security Assessment and Response to Unusual Activities. references (site specific security shift supervision) because these are the individuals trained to confirm that a security event is occurring or has occurred. Training on security event confirmation and classification is controlled due to the nature of Safeguards and 10 CFR § 2.39 information.~~

EAL #2 Basis

~~aAddresses the threat from the impact of an aircraft on the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may also be provided by NORAD through the NRC. Validation of the threat is performed in accordance with AOP-70, Airborne Security. (site specific procedure). addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with (site specific procedure).~~

EAL #3 Basis

~~rReferences Security Force (site specific security shift supervision) - because these are the individuals trained to confirm that a security event is occurring or has occurred. Training on security event confirmation and classification is controlled due to the nature of Safeguards and 10 CFR § 2.39 information. addresses the threat from the impact of an aircraft on the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may also be provided by NORAD through the NRC. Validation of the threat is performed in accordance with (site specific procedure).~~

~~Emergency plans and implementing procedures are public documents; therefore, EALs~~

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

~~should not incorporate Security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.~~

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

Basis Reference(s):

1. JAFNPP Safeguards Contingency Plan
2. AOP-70 Security Threat
3. SY-AA-101-132, Security Assessment and Response to Unusual Activities
4. NEI 99-01 Rev 6, HU1

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HS26**Initiating Condition:**

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):**Note:**

- The Emergency Director should declare the ~~Site Area Emergency event~~ promptly upon determining that ~~(site-specific number the applicable time of minutes)~~ has been exceeded, or will likely be exceeded

1. A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per AOP-43, Plant Shutdown from Outside the Control Room.

AND

2. Control of **ANY** Table H1 safety function is not reestablished in **< 15 minutes**.

| Table H1 Safety Functions |
|--|
| <ul style="list-style-type: none"> • Reactivity Control (ability to shut down the reactor and keep it shutdown) • RPV Water Level (ability to cool the core) • RCS Heat Removal (ability to maintain heat sink) |

- Reactivity Control (ability to shut down the reactor and keep it shutdown)
- RPV Water Level (ability to cool the core)
- RCS Heat Removal (ability to maintain heat sink)

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

AND

- ~~b. Control of **ANY** of the following key safety functions is not reestablished within (site-specific number of minutes).~~

- ~~• Reactivity control~~
- ~~• Core cooling [PWR] / RPV water level [BWR]~~
- ~~• RCS heat removal~~

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

Basis:

The time period to establish control of the plant starts when either:

- a. Control of the plant is no longer maintained in the Main Control Room
OR
- b. The last Operator has left the Main Control Room.

This IC addresses an evacuation of the Control Room that results in transfer of plant control to alternate locations, and the control of a key safety function cannot be reestablished in a timely manner. The failure to gain control of a key safety function following a transfer of plant control to alternate locations is a precursor to a challenge to ~~one or more~~any fission product barriers within a relatively short period of time.

The determination of whether or not “control” is established at the remote safe shutdown location(s) is based on Emergency Director judgment. The Emergency Director is expected to make a reasonable, informed judgment within ~~(the site-specific time for transfer)~~ 3015 minutes whether or not the operating staff has control of key safety functions from the remote safe shutdown location(s).

Escalation of the emergency classification level would be via IC FG1 or CG64.

Basis Reference(s):

1. AOP-43 Plant Shutdown from Outside the Control Room
2. NEI 99-01, Rev 6 HS6

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HA26

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per AOP-43, Plant Shutdown from Outside the Control Room.

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

Basis:

This IC addresses an evacuation of the Control Room that results in transfer of plant control to alternate locations outside the Control Room. The loss of the ability to control the plant from the Control Room is considered to be a potential substantial degradation in the level of plant safety.

Following a Control Room evacuation, control of the plant will be transferred to alternate shutdown locations. The necessity to control a plant shutdown from outside the Control Room, in addition to responding to the event that required the evacuation of the Control Room, will present challenges to plant operators and other on-shift personnel. Activation of the ERO and emergency response facilities will assist in responding to these challenges.

Escalation of the emergency classification level would be via IC HS26.

Basis Reference(s):

1. AOP-43 Plant Shutdown from Outside the Control Room
2. NEI 99-01, Rev 6 HA6

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HU34

Initiating Condition:

FIRE potentially degrading the level of safety of the plant.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

- -The Emergency Director should declare the ~~Unusual Event~~event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
 - Escalation of the emergency classification level would be via IC CA2 or MA5.
1. A FIRE in any Table H2 area is **not** extinguished in **< 15 minutes** of ANY of the following FIRE detection indications:
- Report from the field (i.e., visual observation)
 - Receipt of multiple (more than 1) fire alarms or indications
 - Field verification of a single fire alarm

| Table H2 Areas |
|--|
| <ul style="list-style-type: none"> • Reactor Building (when inerted the Drywell is exempt) • Control Room / Relay Room / Cable Run Rooms / Cable Spreading Room • Electric Bays • Control Room AC Equipment Room • Control Room Chiller Room • Emergency Diesel Generator Building • Battery Rooms / Battery Room Corridor • RHRSW / ESW Pump Rooms • Cable Tunnels • Remote Safe Shutdown Panels 25ASP-4 and 25ASP-5 (for MSIV / ADS) |

OR

2. a. Receipt of a single fire alarm in any Table H2 area (i.e., no other indications of a FIRE).

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

AND

- b. The existence of a FIRE is not verified in **< 30 minutes** of alarm receipt.

OR

- 3 A FIRE within the plant or ISFSI PROTECTED AREA not extinguished in **< 60 minutes** of the initial report, alarm or indication.

OR

- 4 A FIRE within the plant or ISFSI PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish.
- (1) a. A FIRE is NOT extinguished within 15 minutes of **ANY** of the following FIRE detection indications:
- Report from the field (i.e., visual observation)
 - Receipt of multiple (more than 1) fire alarms or indications
 - Field verification of a single fire alarm

AND

- b. The FIRE is located within **ANY** of the following plant rooms or areas:
_____(site specific list of plant rooms or areas)
- (2) a. Receipt of a single fire alarm (i.e., no other indications of a FIRE).

AND

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

AND

- c. The existence of a FIRE is not verified within 30 minutes of alarm receipt.
- (3) A FIRE within the plant or ISFSI [for plants with an ISFSI outside the plant Protected Area] PROTECTED AREA not extinguished within 60 minutes of the initial report, alarm or indication.
- (4) A FIRE within the plant or ISFSI [for plants with an ISFSI outside the plant Protected Area] PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

Basis:

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

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

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

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

EAL #1 Basis

The intent of the 15 -minute duration is to size the FIRE and to discriminate against small FIRES that are readily extinguished (e.g., smoldering waste paper basket). In addition to alarms, other indications of a FIRE could be a drop in fire main pressure, automatic activation of a suppression system, etc.

Upon receipt, operators will take prompt actions to confirm the validity of an initial fire alarm, indication, or report. For EAL assessment purposes, the emergency declaration clock starts at the time that the initial alarm, indication, or report was received, and not the time that a subsequent verification action was performed. Similarly, the fire duration clock also starts at the time of receipt of the initial alarms, indication or report.

EAL #2 Basis

This EAL addresses receipt of a single fire alarm, and the existence of a FIRE is not verified (i.e., proved or disproved) within 30 -minutes of the alarm. Upon receipt, operators will take prompt actions to confirm the validity of a single fire alarm. For EAL assessment purposes, the 30- minute clock starts at the time that the initial alarm was received, and not the time that a subsequent verification action was performed.

A single fire alarm, absent other indication(s) of a FIRE, may be indicative of equipment failure or a spurious activation, and not an actual FIRE. For this reason, additional time is allowed to verify the validity of the alarm. The 30 -minute period is a reasonable amount of time to determine if an actual FIRE exists; however, after that time, and absent information to the contrary, it is assumed that an actual FIRE is in progress.

If an actual FIRE is verified by a report from the field, then EAL #1 is immediately applicable, and the emergency must be declared if the FIRE is not extinguished within 15-minutes of the report. If the alarm is verified to be due to an equipment failure or a spurious activation, and this verification occurs within 30- minutes of the receipt of the alarm, then this EAL is not applicable and no emergency declaration is warranted.

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

EAL #3 Basis

In addition to a FIRE addressed by EAL #1 or EAL #2, a FIRE within the plant PROTECTED AREA not extinguished within 60 -minutes may also potentially degrade the level of plant safety. ~~This basis extends to a FIRE occurring within the PROTECTED AREA of an ISFSI located outside the plant PROTECTED AREA. [Sentence for plants with an ISFSI outside the plant Protected Area]~~

EAL #4 Basis

If a FIRE within the plant ~~or ISFSI [for plants with an ISFSI outside the plant Protected Area]~~ PROTECTED AREA is of sufficient size to require a response by an offsite firefighting agency (e.g., a local town Fire Department), then the level of plant safety is potentially degraded. The dispatch of an offsite firefighting agency to the site requires an emergency declaration only if it is needed to actively support firefighting efforts because the fire is beyond the capability of the Fire Brigade to extinguish. Declaration is not necessary if the agency resources are placed on stand-by, or supporting post-extinguishment recovery or investigation actions.

~~ISFSI is not specifically addressed in EAL #3 and #4 since it is within the plant PROTECTED AREA and is therefore covered under EALs #3 and #4.~~

Basis-Related Requirements from Appendix R

Appendix R to 10 CFR 50, states in part:

Criterion 3 of Appendix A to this part specifies that "Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions."

When considering the effects of fire, those systems associated with achieving and maintaining safe shutdown conditions assume major importance to safety because damage to them can lead to core damage resulting from loss of coolant through boil-off.

Because fire may affect safe shutdown systems and because the loss of function of systems used to mitigate the consequences of design basis accidents under post-fire conditions does not per se impact public safety, the need to limit fire damage to systems required to achieve and maintain safe shutdown conditions is greater than the need to limit fire damage to those systems required to mitigate the consequences of design basis accidents.

In addition, Appendix R to 10 CFR 50, requires, among other considerations, the use of 1-hour fire barriers for the enclosure of cable and equipment and associated non-safety circuits of one redundant train (G.2.c). As used in EAL #2, the 30-minutes to verify a single alarm is well within this worst-case 1-hour time period.

Depending upon the plant mode at the time of the event, escalation of the emergency classification level would be via IC CA26 or MA5SA9.

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

Basis Reference(s):

1. FSAR Update Section 12.3
2. JAFNPP Safe Shutdown Analysis
3. NEI 99-01, Rev 6 HU4

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HU42

Initiating Condition:

Seismic event greater than OBE levels.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

- For emergency classification if EAL # 2.b is not able to be confirmed, then the occurrence of a seismic event is confirmed in manner deemed appropriate by the Emergency Director in **≤ 15 minutes** of the event.
 - Escalation of the emergency classification level would be via IC CA2 or MA5
1. Seismic event > **Operating Basis Earthquake (OBE)** as determined by seismic monitoring system in accordance with AOP-14 Earthquake.

OR

2. When Seismic Monitoring Equipment is **not** available:

- a. Control Room personnel feel an actual or potential seismic event.

AND

b. **ANY** one of the following confirmed in **≤ 15 minutes** of the event:

- The earthquake resulted in Modified Mercalli Intensity (MMI) **≥ VI** and occurred **≤ 3.5 miles** of the plant.
- The earthquake was magnitude **≥ 6.0**
- The earthquake was magnitude **≥ 5.0** and occurred **≤ 125 miles** of the plant.

~~Seismic event greater than Operating Basis Earthquake (OBE) as indicated by:~~

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

Basis:

EAL #1 Basis

This IC addresses a seismic event that results in accelerations at the plant site greater than those specified for an Operating Basis Earthquake (OBE)¹. An earthquake greater

¹ An OBE is vibratory ground motion for which those features of a nuclear power plant necessary for continued operation without undue risk to the health and safety of the public will remain functional.

RECOGNITION CATEGORY**HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

than an OBE but less than a Safe Shutdown Earthquake (SSE)² should have no significant impact on safety-related systems, structures and components; however, some time may be required for the plant staff to ascertain the actual post-event condition of the plant (e.g., performs walk-downs and post-event inspections). Given the time necessary to perform walk-downs and inspections, and fully understand any impacts, this event represents a potential degradation of the level of safety of the plant.

Event verification with external sources should not be necessary during or following an OBE. Earthquakes of this magnitude should be readily felt by on-site personnel and recognized as a seismic event (e.g., typical lateral accelerations are in excess of 0.08g). The Shift Manager or Emergency Director may seek external verification if deemed appropriate (e.g., a call to the USGS, check internet news sources, etc.); however, the verification action must not preclude a timely emergency declaration.

EAL #2 Basis

EAL #2 is included to ensure that a declaration does not result from felt vibrations caused by a non-seismic source (e.g., a dropped load). The Shift Manager or Emergency Director may seek external verification if deemed appropriate (e.g., call to USGS, check internet source, etc.) however, the verification action must not preclude a timely emergency declaration. This guidance recognizes that it may cause the site to declare an Unusual Event while another site, similarly affected but with readily available OBE indications in the Control Room, may not.

Depending upon the plant mode at the time of the event, escalation of the emergency classification level would be via IC CA26 or MA5SA9.

Basis Reference(s):

1. FSAR Update Section 2.6 Engineering Seismology
2. AOP-14 Earthquake
3. US NRC Reg. Guide 1.166, Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Earthquake Actions
4. NEI 99-01, Rev 6 HU2
7. NEI 99-01, Rev 6 HU2

² An SSE is vibratory ground motion for which certain (generally, safety-related) structures, systems, and components must be designed to remain functional.

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HA5**Initiating Condition:**

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

Operating Mode Applicability:

~~1, 2, 3, 4, 5, D~~

Emergency Action Level (EAL):**Note:**

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

1. Release of a toxic, corrosive, asphyxiant or flammable gas in a Table H3 area.

| Table H3 Areas with Entry Related Mode Applicability | |
|--|---|
| Area | Entry Related Mode Applicability |
| <ul style="list-style-type: none"> • Reactor Building East Crescent • Reactor Building West Crescent • Reactor Building 272' Elevation • Reactor Building 300' Elevation • Relay Room • North Cable Room | <p>Modes 3, 4, and 5</p> |

AND

2. Entry into the room or area is prohibited or impeded

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

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

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

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY
AND

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

Basis:

This IC addresses an event involving a release of a hazardous gas that precludes or impedes access to equipment necessary ~~to transition the plant from normal plant operation to cooldown and shutdown as specified in normal plant procedures to maintain normal plant operation, or required for a normal plant cooldown and shutdown.~~ This condition represents an actual or potential substantial degradation of the level of safety of the plant.

~~Assuming all plant equipment is operating as designed, normal operation is capable from the Main Control Room (MCR). The plant is also able to transition into a hot shutdown condition from the MCR, therefore Table H3 is a list of plant rooms or areas with entry-related mode applicability that contain equipment which require a manual/local action necessary to transition the plant from normal plant operation to cooldown and shutdown as specified in normal operating procedures (establish shutdown cooling), where if this action is not completed the plant would not be able to attain and maintain cold shutdown.~~

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

~~This Table does not include the Control Room since adequate engineered safety/design features are in place to preclude a Control Room evacuation due to the release of a hazardous gas.~~

~~An Alert declaration is warranted if entry into the affected room/area is, or may be, procedurally required during the plant operating mode in effect and the gaseous release preclude the ability to place shutdown cooling in service at the time of the gaseous release.~~ The emergency classification is not contingent upon whether entry is actually necessary at the time of the release.

Evaluation of the IC and EAL do not require atmospheric sampling; it only requires the Emergency Director's judgment that the gas concentration in the affected room/area is sufficient to preclude or significantly impede procedurally required access. This judgment may be based on a variety of factors including an existing job hazard analysis, report of ill effects on personnel, advice from a subject matter expert or operating experience with the same or similar hazards. Access should be considered as impeded if extraordinary measures are necessary to facilitate entry of personnel into the affected room/area (e.g., requiring use of protective equipment, such as SCBAs, that is not routinely employed).

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

- The plant is in an operating mode different than the mode specified for the affected room/area (i.e., entry is not required during the operating mode in effect at the time

RECOGNITION CATEGORY**HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

of the gaseous release). For example, the plant is in Mode 1 when the gaseous release occurs, and the procedures used for normal operation, cooldown and shutdown do not require entry into the affected room until Mode 4.

- The gas release is a planned activity that includes compensatory measures which address the temporary inaccessibility of a room or area (e.g., fire suppression system testing).
- The action for which room/area entry is required is of an administrative or record keeping nature (e.g., normal rounds or routine inspections).
- The access control measures are of a conservative or precautionary nature, and would not actually prevent or impede a required action.

An asphyxiant is a gas capable of reducing the level of oxygen in the body to dangerous levels. Most commonly, asphyxiants work by merely displacing air in an enclosed environment. This reduces the concentration of oxygen below the normal level of around 19%, which can lead to breathing difficulties, unconsciousness or even death.

This EAL does not apply to firefighting activities **that generate smoke**, that automatically or manually activate a fire suppression system in an area, or to intentional inerting of containment.

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

Basis Reference(s):

1. JAFNPP Safe Shutdown Analysis
2. NEI 99-01, Rev 6 HA5

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HU63

Initiating Condition:

Hazardous Event

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):**Note:**

- EAL #4 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents.
- Escalation of the emergency classification level would be via IC CA2 or MA5.

1. Tornado strike within the PROTECTED AREA.

OR

2. Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component required by Technical Specifications for the current operating mode.

OR

3. Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release).

OR

4. A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles.

OR

5. Intake Water Level > **255 feet**.

OR

6. ESW intake bay water level \leq **237 feet**.

~~**Note:** EAL #3 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents.~~

~~(1) A tornado strike within the PROTECTED AREA.~~

RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

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

Basis:

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

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

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

EAL #1 Basis

aAddresses a tornado striking (touching down) within the Protected Area.

EAL #2 Basis

aAddresses flooding of a building room or area that results in operators isolating power to a SAFETY SYSTEM component due to water level or other wetting concerns. Classification is also required if the water level or related wetting causes an automatic isolation of a SAFETY SYSTEM component from its power source (e.g., a breaker or relay trip). To warrant classification, operability of the affected component must be required by Technical Specifications for the current operating mode

EAL #3 Basis

aAddresses a hazardous materials event originating at an offsite location and of sufficient magnitude to impede the movement of personnel within the PROTECTED AREA.

EAL #4 Basis

aAddresses a hazardous event that causes an on-site impediment to vehicle movement and significant enough to prohibit the plant staff from accessing the site using personal vehicles. Examples of such an event include site flooding caused by a hurricane, heavy

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

rains, ~~up river water releases, dam failure, etc., or an on-site train derailment blocking the access road~~ or high winds.

This EAL is not intended to apply to routine impediments such as fog, snow, ice, or vehicle breakdowns or accidents, but rather to more significant conditions such as the Hurricane Andrew strike on Turkey Point in 1992, the flooding around the Cooper Station during the Midwest floods of 1993, or the flooding around Ft. Calhoun Station in 2011.

EAL #5 Basis

The high lake level is based upon the revised design flood level for the screenwell interior walls and gates.

EAL #6 Basis

The low level of ≤ 237 feet is selected since IAW AOP-56, Intake Water Level Trouble at 237.5 feet there is adequate time to reduce power (scramming the reactor), remove the second CW pump and trend intake water level as mitigating actions. The ESW pumps are declared inoperable (Alert threshold) at 236.5 feet, so 237 feet allows for mitigating action to be taken prior to declaration and is above the Alert threshold allowing for escalation between the Unusual Event and the Alert thresholds. ~~EAL #5 addresses (site specific description).~~

Escalation of the emergency classification level would be based on ICs in Recognition Categories RA, F, MS, H or C.

Basis Reference(s):

1. FSAR Section 2.4.3
2. Safety Evaluation JAF-SE-93-034 "Evaluation of Maximum and Minimum Water Levels at Screenwell for Safe Operation of Class I Equipment"
3. NEI 99-01, Rev 6 HU3
4. AOP-56, Intake Water Level Trouble

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY****HG7****Initiating Condition:**

Other conditions exist which in the judgment of the Emergency Director warrant declaration of a GENERAL EMERGENCY.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

(4) Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMEDIATE substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Basis:

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

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

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

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

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

Basis Reference(s):

1. NEI 99-01, Rev 6 HG7

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY****HS7****Initiating Condition:**

Other conditions exist which in the judgment of the Emergency Director warrant declaration of a SITE AREA EMERGENCY.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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

Basis:

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

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

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

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

Basis Reference(s):

1. NEI 99-01, Rev 6 HS7

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY****HA7****Initiating Condition:**

Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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

Basis:

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

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

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

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

Basis Reference(s):

1. NEI 99-01, Rev 6 HA7

**RECOGNITION CATEGORY
HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY**

HU7**Initiating Condition:**

Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ~~(NO)UEUNUSUAL EVENT~~.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

~~(4)~~ Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Basis:

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

Basis Reference(s):

1. NEI 99-01, Rev 6 HU7

**RECOGNITION CATEGORY
ISFSI MALFUNCTIONS**

E-HU1

Initiating Condition

Damage to a loaded cask CONFINEMENT BOUNDARY.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by a radiation reading > Table E-1 values:

| Table E-1 Radiation Reading | | | | |
|---|---|--|--|---|
| Overpack Serial Number | Overpack Average Surface Dose Rates mrem/hr (gamma+neutron) | | Overpack Serial Number HI-STORM 100S (XXX) | Overpack Average Surface Dose Rates mrem/hr (gamma+neutron) |
| HI-STORM 100S S/N - 15, 16, 17 | 80 on the side 20 on the top 32 at the inlet and outlet vent ducts | | S/N – 0186, 0187, 0188 | 220 on the side 40 on the top |
| HI-STORM 100S (232) S/N – 0169, 0170, 0171 | 100 on the side 20 on the top 90 at the inlet and outlet vent ducts | | S/N – 0307, 0308, 0309, 0310, 0311, 0312, 0679, 0680, 0681, 0682, 0683, 0690, 0691, 0692, 0693, 0694, 0695 | 600 on the side 60 on the top |

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

Basis:

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

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

**RECOGNITION CATEGORY
ISFSI MALFUNCTIONS**

This IC addresses an event that results in damage to the CONFINEMENT BOUNDARY of a storage cask containing spent fuel. It applies to irradiated fuel that is licensed for dry storage beginning at the point that the loaded storage cask is sealed. **The word cask, as used in this EAL, refers to the storage container in use at the site for dry storage of irradiated fuel.** The issues of concern are the creation of a potential or actual release path to the environment, degradation of ~~one or more~~any fuel assemblies due to environmental factors, and configuration changes which could cause challenges in removing the cask or fuel from storage.

The existence of “damage” is determined by radiological survey. The technical specification multiple of “2 times”, which is also used in Recognition Category RA IC RAU1, is used here to distinguish between non-emergency and emergency conditions. The emphasis for this classification is the degradation in the level of safety of the spent fuel cask and not the magnitude of the associated dose or dose rate. It is recognized that in the case of extreme damage to a loaded cask, the fact that the “on-contact” dose rate limit is exceeded may be determined based on measurement of a dose rate at some distance from the cask.

Security-related events for ISFSIs are covered under ICs HU1 and HA1.

Basis Reference(s):

1. NEI 99-01, Rev 6 E-HU1
2. ISFSI Certificate Of Compliance Amendment No.'s 0, 1, 2, 5, and 8.