Exelon Generation

200 Exelon Way
Kennett Square, PA 19348

www.exeloncorp.com

10 CFR 50.90
10 CFR 50, Appendix E

JAFP-18-0068

July 12, 2018

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
Docket No. 50-333

James A. FitzPatrick Nuclear Power Plant
Independent Spent Fuel Storage Installation
General License SFGL-12
Docket No. 72-012

Subject: Response to Request for Additional Information
License Amendment Request to Adopt Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6, *"Development of Emergency Action Levels for Non-Passive Reactors"*

References:

1) Letter from David T. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission - License Amendment Request to Adopt Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated January 31, 2018 (ML18037A786)

2) Electronic Mail Request from Tanya Hood (U.S. Nuclear Regulatory Commission) to Richard Gropp, et al. (Exelon Generation Company, LLC) – Draft RAIs - FitzPatrick - LAR to Adopt EAL Schemes Pursuant to NEI 99-01, Revision 6, dated June 7, 2018

3) Electronic Mail Request from Tanya Hood (U.S. Nuclear Regulatory Commission) to Bryan Hanson et al. (Exelon Generation Company, LLC) – FitzPatrick RAIs - LAR to Adopt EAL Schemes Pursuant to NEI 99-01, Revision 6, dated June 13, 2018 (ML18164A365)

By letter dated January 31, 2018 (Reference 1), Exelon Generation Company, LLC (Exelon) submitted a License Amendment Request (LAR) to support changes to the Emergency Plan for the James A. FitzPatrick Nuclear Power Plant (FitzPatrick). Specifically, the proposed changes involve revising the Emergency Plan for FitzPatrick to adopt the Nuclear Energy Institute's

(NEI's) revised Emergency Action Level (EAL) schemes described in NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," which have been endorsed by the NRC as documented in an NRC letter dated March 28, 2013 (ML12346A463).

Appendix E, Section IV.B.2, of 10 CFR 50 stipulates that a licensee desiring to change its entire EAL scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. The currently approved Emergency Plan EAL schemes for the cited facilities are based on the guidance established in NEI 99-01, Revision 5, "Methodology for Development of Emergency Action Levels." Exelon is proposing to adopt the EAL schemes based on the latest NRC-endorsed guidance, which is described in NEI 99-01, Revision 6.

In a U.S. Nuclear Regulatory Commission (NRC) electronic mail message dated June 7, 2018 (Reference 2), the NRC indicated that it had reviewed the information submitted in the Reference 1 letter pertaining to the proposed LAR and requested additional clarifying information to support its continued review. The Reference 2 electronic mail request contained a draft NRC questions, which were further discussed during a June 13, 2018, teleconference between Exelon and NRC representatives. Subsequently, in an electronic mail message dated June 13, 2018 (Reference 3), the NRC formally issued its Request for Additional Information (RAI) related to the amendment request and requested a response within 30 days.

Accordingly, Attachment 1 provides Exelon's response to the RAI contained in the Reference 3. Attachment 2 includes revised redline and revised clean pages for the affected EAL Basis documents along with revised procedure matrix pages for FitzPatrick.

Exelon has reviewed the information supporting a finding of No Significant Hazards Consideration and the Environmental Consideration provided to the NRC in the Reference 1 submittal. The additional information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. Furthermore, the additional information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

In accordance with 10 CFR 50.91, *"Notice for public comment; State consultation,"* paragraph (b), Exelon is notifying the State of New York of this RAI response by transmitting a copy of this letter and the supporting attachments and enclosures to the designated State Official.

There are no regulatory commitments contained in this submittal.

If you have any questions concerning this submittal, please contact Richard Gropp at (610) 765-5557.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 12th day of July 2018.

Respectfully,

David T. Gudger
Manager, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments:

Attachment 1 - Response to the Request for Additional Information - License Amendment Request to Adopt Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6, *"Development of Emergency Action Levels for Non-Passive Reactors"*

Attachment 2 - Revised Radiological Emergency Plan Annex Information for James A. FitzPatrick Nuclear Power Plant
- Enclosure 2B – Revised Redline EAL Basis Document Pages
- Enclosure 2C – Revised EAL Clean Basis Document Pages
- Enclosure 2E – Revised Procedure Matrix Pages

cc: w/ Attachments/Enclosures
Regional Administrator – NRC Region I
NRC Senior Resident Inspector – James A. FitzPatrick Nuclear Power Plant
NRC Project Manager, NRR – James A. FitzPatrick Nuclear Power Plant
A. L. Peterson, NYSERDA

ATTACHMENT 1

Response to the Request for Additional Information

License Amendment Request to Adopt Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6, *"Development of Emergency Action Levels for Non-Passive Reactors"*

Response to Request for Additional Information
License Amendment Request to
Adopt Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6,
"Development of Emergency Action Levels for Non-Passive Reactors"

By letter dated January 31, 2018 (Reference 1), Exelon Generation Company, LLC (Exelon) submitted a License Amendment Request (LAR) to support changes to the Emergency Plan for the James A. FitzPatrick Nuclear Power Plant (FitzPatrick). Specifically, the proposed changes involve revising the Emergency Plan for FitzPatrick to adopt the Nuclear Energy Institute's (NEI's) revised Emergency Action Level (EAL) schemes described in NEI 99-01, Revision 6, *"Development of Emergency Action Levels for Non-Passive Reactors,"* which have been endorsed by the NRC as documented in an NRC letter dated March 28, 2013 (ML12346A463).

Appendix E, Section IV.B.2, of 10 CFR 50 stipulates that a licensee desiring to change its entire EAL scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. The currently approved Emergency Plan EAL schemes for the cited facilities are based on the guidance established in NEI 99-01, Revision 5, *"Methodology for Development of Emergency Action Levels."* Exelon is proposing to adopt the EAL schemes based on the latest NRC-endorsed guidance, which is described in NEI 99-01, Revision 6.

In a U.S. Nuclear Regulatory Commission (NRC) electronic mail message dated June 7, 2018 (Reference 2), the NRC indicated that it had reviewed the information submitted in the Reference 1 letter pertaining to the proposed LAR and requested additional clarifying information to support its continued review. The Reference 2 electronic mail request contained a draft NRC questions, which were further discussed during a June 13, 2018, teleconference between Exelon and NRC representatives. Subsequently, in an electronic mail message dated June 13, 2018 (Reference 3), the NRC formally issued its Request for Additional Information (RAI) related to the amendment request and requested a response within 30 days.

The questions included in the Reference 3 electronic mail message are restated below followed by Exelon's response.

Response to NRC Questions

RAI-1

Section 4.3, "Instrumentation Used for EALs," to NEI 99-01, Revision 6, states: "Scheme developers should ensure that specific values used as EAL setpoints are within the calibrated range of the referenced instrumentation." Confirm that all setpoints and indications used in the FitzPatrick EAL scheme are within the calibrated range(s) of the stated instrumentation and that the resolution of the instrumentation is appropriate for the setpoint/indication.

Response to Request for Additional Information
License Amendment Request to
Adopt Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6,
"Development of Emergency Action Levels for Non-Passive Reactors"

By letter dated January 31, 2018 (Reference 1), Exelon Generation Company, LLC (Exelon) submitted a License Amendment Request (LAR) to support changes to the Emergency Plan for the James A. FitzPatrick Nuclear Power Plant (FitzPatrick). Specifically, the proposed changes involve revising the Emergency Plan for FitzPatrick to adopt the Nuclear Energy Institute's (NEI's) revised Emergency Action Level (EAL) schemes described in NEI 99-01, Revision 6, *"Development of Emergency Action Levels for Non-Passive Reactors,"* which have been endorsed by the NRC as documented in an NRC letter dated March 28, 2013 (ML12346A463).

Appendix E, Section IV.B.2, of 10 CFR 50 stipulates that a licensee desiring to change its entire EAL scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. The currently approved Emergency Plan EAL schemes for the cited facilities are based on the guidance established in NEI 99-01, Revision 5, *"Methodology for Development of Emergency Action Levels."* Exelon is proposing to adopt the EAL schemes based on the latest NRC-endorsed guidance, which is described in NEI 99-01, Revision 6.

In a U.S. Nuclear Regulatory Commission (NRC) electronic mail message dated June 7, 2018 (Reference 2), the NRC indicated that it had reviewed the information submitted in the Reference 1 letter pertaining to the proposed LAR and requested additional clarifying information to support its continued review. The Reference 2 electronic mail request contained a draft NRC questions, which were further discussed during a June 13, 2018, teleconference between Exelon and NRC representatives. Subsequently, in an electronic mail message dated June 13, 2018 (Reference 3), the NRC formally issued its Request for Additional Information (RAI) related to the amendment request and requested a response within 30 days.

The questions included in the Reference 3 electronic mail message are restated below followed by Exelon's response.

Response to NRC Questions

RAI-1

Section 4.3, "Instrumentation Used for EALs," to NEI 99-01, Revision 6, states: "Scheme developers should ensure that specific values used as EAL setpoints are within the calibrated range of the referenced instrumentation." Confirm that all setpoints and indications used in the FitzPatrick EAL scheme are within the calibrated range(s) of the stated instrumentation and that the resolution of the instrumentation is appropriate for the setpoint/indication.

Response

As part of Exelon's Emergency Action Level Scheme change process each threshold that is derived from plant instrumentation has been verified to be within the instrument's range in accordance with EP-AA-120-F-08, "Emergency Action Level (EAL) Numerical Change." For Exelon EAL HU6.5, the 255-foot threshold value is determined by lake water level in the screen well intake structure at the 255-foot floor level elevation.

RAI-2

The proposed EAL RA3.1 includes either the Central Alarm Station (CAS) or the Secondary Alarm Station (SAS) as threshold criteria. If the CAS and SAS can both provide access to areas required to assure safe plant operations, explain why the EAL does not provide an "AND" logic to the CAS and SAS, or select the primary station as the threshold value as provided in accordance with endorsed guidance.

Response

The primary station has been selected as the Central Alarm Station (CAS), and the Secondary Alarm Station (SAS) has been removed from EAL RA3.1.

RAI-3

The Basis discussion for EAL RU3 states, in part: "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."

Explain how a decision-maker can quickly and accurately determine whether or not a letdown radiation monitor alarm is due to clad damage. Alternatively, revise the EAL RU3 basis to remove the identification of fuel cladding degradation as a criterion.

Response

The following sentence has been removed from the Basis discussion for EAL RU3.

> *"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."*

RAI-4

The proposed Fission Product Barrier EAL CT3 - Potential Loss 3 threshold value includes the qualifier "and rising" to the maximum containment pressure. NEI 99-01, Revision 6, provides that the values used to assess EALs should be valid. The fact that containment pressure has reached the maximum design pressure represents itself a potential loss of containment. The inclusion of "and rising" could result in classification delays for valid containment pressure

conditions that are substantially above the maximum design pressure because the pressure was not continuing to rise.

Remove "and rising" from the proposed Fission Product Barrier CT3 - Potential Loss 3 threshold value, consistent with the endorsed guidance, or explain how a containment pressure in excess of design pressure, with a lowering pressure due to barrier degradation, would be appropriately assessed.

Response

The qualifier "and rising" has been removed from the threshold for EAL CT3 - Potential Loss 3.

RAI-5

The proposed EALs MA1 and CU1 imply that emergency diesel generator (EDG) A, EDG B, EDG C, and EDG D are independent power supplies, each of which is capable of powering emergency buses 10500 and 10600. This is consistent with the first bulleted example in the Basis section. However, the FitzPatrick Technical Specifications and Final Safety Analysis Report indicate that FitzPatrick has two subsystems capable of powering emergency buses 10500 and 10600. These subsystems each consist of two emergency diesel generators.

Explain whether or not the four EDGs provided in the threshold value for EALs MA1 and CU1 can independently provide required power for a spectrum of events. If the EDGs cannot independently provide required power for a spectrum of events, then revise the MA1 threshold value and Basis discussion as appropriate.

Response

Although an Emergency Diesel Generator (EDG) "Subsystem" is defined as a pair of EDGs which have the capability to power their respective emergency bus, the FitzPatrick EDG and emergency electrical distribution systems are designed such that a single EDG can be operated to power its respective emergency bus and power a reduced compliment of safety-related loads. The normal Operating Procedure for the EDGs (i.e., OP-22), specifically allows for operation of a single EDG tied to its respective emergency bus.

This ability is even part of the automatic starting sequence design of an EDG Subsystem during a Loss of Coolant Accident (LOCA). If the EDGs fail to come up to speed as a matched pair, the EDG tie breaker will not auto-close (both engines must activate their 200 rpm relays within three seconds to allow force parallel closure of the tie breaker). In this case, when the first EDG reaches 90% of rated voltage, its output breaker will close to repower the emergency bus and the other EDG output breaker would be blocked from auto-closing onto the emergency bus. This circuit logic is essentially looking for a failure of one EDG to start for any reason.

In either case, a single EDG rating is normally 2600 kW (provisions are available to operate above rated load for limited periods of time). In a LOCA situation, 2600 kW is sufficient to power a single Core Spray pump and a single Residual Heat Removal Pump, which are automatically re-sequenced onto the emergency bus after it is repowered by the single EDG.

The second Residual Heat Removal pump powered from that emergency bus is blocked from automatically re-sequencing onto the bus to prevent overloading the bus during initial EDG loading. Operation of additional emergency loads is then performed at the discretion and direction of the operating shift within the allowed loading limits of the single EDG.

This single EDG capability is generically described in UFSAR Section 8.6-5, Step 6. The lead-in sentence: "Although no credit for accident mitigation is taken, the design of the EDG system is such that if either diesel generator of an emergency AC power source fails to start in response to the automatic start signal...," simply means that no credit is taken in the Technical Specifications for that train as far as accident mitigation is concerned. As part of the Emergency Plan, a single EDG will power a single emergency bus and will provide sufficient power to operate safety systems including multiple low-pressure Emergency Core Cooling System (ECCS) injection pumps.

RAI-6

a. *For EALs MA5 and CA2, Exelon proposed a wording modification to the NRC guidance contained in EPFAQ 2016-02, "Clarification of Equipment Damage as a Result of a Hazardous Event." [5] This modification affects a note for the threshold values. The key wording change is identified in bold as follows:*

   EPFAQ 2016-02

   If the hazardous event only resulted in VISIBLE DAMAGE, ***with no indications of degraded performance*** *to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.*

   Exelon proposed

   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.*

   This is a change of intent from the NRC guidance contained in EPFAQ 2016-02, which was that an Alert should not be declared unless there was VISIBLE DAMAGE resulting from the hazardous event, with no indications of degraded performance. Without this condition, an Alert could be declared even if the affected equipment was not currently required to be in operation. Align EALs MA5 and CA2 EALs with the intent of EPFAQ 2016-0,2 or provide a justification that supports the revised MA5 and CA2 in EAL notes.

b. *For EALs MA5 and CA2, Exelon proposed a wording modification to the NRC guidance contained in EPFAQ 2016-02. This modification affects threshold value 2.a. The key wording change is identified in bold as follows:*

EPFAQ 2016-02

Event damage has caused indications of degraded performance on one train of a SAFETY SYSTEM needed for the current operating mode.

Exelon proposed

*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.*

This is a change of intent from the NRC guidance contained in EPFAQ 2016-02. As the threshold value includes "or VISIBLE DAMAGE," an Alert could be declared when the only impact is visible damage to both trains. Revise EALs MA5 and CA2 to align with the intent of EPFAQ 2016-02, or provide a justification that supports the revised MA5 and CA2 EAL notes, as provided by Exelon, for FitzPatrick.

c. *Exelon proposes the addition of the following alternative condition to threshold value 2.b for EALS MA5 and CA2:*

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

*It appears that the above additional threshold value is intended to require the declaration of MA5 or CA2 whenever a hazardous event has caused degraded performance or visible damage to one train of a SAFETY SYSTEM, whenever an additional train of the safety system is inoperable or out of service. The intent of EPFAQ 2016-02 is to declare an Alert if the hazardous event has resulted in **degraded performance** to the one train, and **VISIBLE DAMAGE or degraded performance** of the second train. Additionally, it appears as though the above alternative condition proposed by Exelon for EALs MA5 and CA2 would not result in an Alert declaration based on the addition of the following note:*

*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."*

Revise EALs MA5 and CA2 to align with the intent of EPFAQ 2016-02, or provide a justification that supports the revised MA5 and CA2 EAL notes, as provided by Exelon, for FitzPatrick.

---

5 ADAMS Accession No. ML17195A299

Response

EALs MA5 and CA2 have been revised as described below to clarify their applicability to SAFETY SYSTEMS with two (2) or more trains, where at least one train exhibits degraded performance and the other train has either visible damage or degraded performance. The

following terminology changes were made to be consistent with terminology used by Operators and to minimize confusion. The word "needed" was changed to "required" in the Initiating Condition (IC) and to "required by Technical Specification" in the EAL, and the reference to the phrase "out of service" was removed. The changes are consistent with the NRC-endorsed NEI 99-01, Revision 6, guidance as clarified by the NRC's response described in Emergency Preparedness Program Frequently Asked Question (EPFAQ) 2016-002 and further discussed during an April 10, 2018, teleconference between Exelon and NRC representatives. Therefore, there should no longer be any potential ambiguity in applying these EALs.

Revised the wording for EALs MA5 and CA2 as follows:

Note:

- This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains.
- If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted.
- If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.
- If a hazardous event occurs and it is determined that the conditions of MA5 [CA2] are not met, then assess the event via HU3, HU4, or HU6.

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
   - Other events with similar hazard characteristics as determined by the Shift Manager

   AND

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

   AND

   c. **EITHER** of the following:
   - 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.

RAI-7

a. *For EALs MU7 and CU4, it appears that if only Out-of-Plant cellular phones were available, then FitzPatrick site would not be able to communicate with onsite personnel as needed to conduct routine operations. Additionally, it does not appear that Out-of-Plant cellular phones would support communications with offsite organizations and the NRC without resorting to relaying of information.*

   Justify using Out-of-Plant cellular phones as a means to support Onsite, Offsite, and NRC communications if no other communication method is available, or revise accordingly. This justification should explain how communications could be completed without resorting to extraordinary means as discussed in the proposed FitzPatrick Emergency Classification Technical Basis Document.

b. *For EALs MU7 and CU4, the staff could not determine whether Plant Satellite Phones, refers to the TSC satellite phone, the handheld satellite phones, or both. Additionally, it does not appear that Plant Satellite Phones would support communications with offsite organizations and the NRC without resorting to relaying of information.*

   Justify using Plant Satellite phones as a means to support Offsite and NRC communications if no other communication method is available, or revise accordingly. This justification should explain how communications could be completed without resorting to extraordinary means as discussed in the proposed FitzPatrick Emergency Classification Technical Basis Document.

Response

a. FitzPatrick maintains installed out-of-plant cellular phones in the Control Room Shift Manager's Office (1), Technical Support Center (TSC) (3), Operations Support Center (OSC) (1), and CAS/SAS (1). The out-of-plant cellular phones are configured within each location to function like a normal desk telephone, but are not connected to the site phone switch and access cellular service via remote installed antennae. These devices are included in periodic surveillances of communications equipment, are in an always-ready state, and are included in the Emergency Telephone Directory as backup phone numbers in these locations. No extraordinary method is required to make use of the devices, they function as a normal desk phone and the user does not need to leave the buildings to use the devices.

   - Communication with onsite personnel via installed out-of-plant cellular phones would be limited during times of normal phone system failure to other cellular devices (fixed and hand-held) and satellite phone devices (e.g., installed device in Control Room, hand-held, and deployable) that are available at the station including personal cellular phones and spare site maintained cellular phones. Additionally, out-of-plant cellular phones and satellite phones are maintained as backup communications at the Emergency Operations Facility (EOF).

- Installed out-of-plant cellular phones support external communications with offsite organizations without the need to relay information. The cellular phones bypass the site hardline telephone system so that during times of system failure the cellular phones are available to be used to directly contact outside agencies (e.g., NRC, vendors, State and County agencies, etc.) utilizing the cellular phone provider network and are strategically placed in the Control Room, CAS/SAS, TSC, and OSC as mounted desk phones.

- The out-of-plant cellular phones function as normal desk phones to the user but bypass the site's hardline and Voice over Internet Protocol (VoIP) phone systems so they are not affected by system outages that could affect these other phone systems.

b. Plant satellite phones include: 1) the fixed permanently installed unit in the Control Room, which functions without additional setup; 2) portable handheld satellite phones staged in the emergency facilities including Control Room, EOF, TSC and OSC; and 3) deployable satellite phones staged in the emergency response facilities.

   The fixed satellite phone in the Control Room can be utilized from the Control Room without resorting to relaying of information. The unit is maintained in a ready-state for use and no setup, cabling or relocation to outside is required to use this device.

   Deployable satellite phones require some setup (i.e., running cables to external antennae, and the handheld satellite phones require the user to be outside.

Communication utilizing the installed out-of-plant cellular phones and installed satellite phone (Control Room Shift Manager Office area) ensure communications can be made to the offsite agencies, NRC and between emergency facilities when loss of hardline and VOIP phone systems occur without the need for extraordinary means such as relaying. Additionally, staged satellite phones (deployable and hand-held) are available for setup to provide additional service in the emergency facilities and from outside if needed. The titles in Tables M-3 and C-1 have been revised to specify "Installed Out-of-Plant Cellular Phones" and "Plant Satellite Phones (Installed in CR or deployable)."

RAI-8

Explain how the term "Security Force" is equivalent to "security supervision," as the intent of EALs HU1.1, HA1.1, and HS1.1, is to ensure an individual specifically trained to identify a hostile action and communicate with the control room is tasked with this responsibility, or revise accordingly.

Response

The term "Security Force" has been replaced with "Security Supervisor" in the FitzPatrick EALs HU1.3, HA1.2, and HS1.

RAI-9

Concerning EAL HS2, the Basis discussions include the following:

The time period to establish control of the plant starts when either:

a) [c]ontrol of the plant is no longer maintained in the Control Room

Or

b) [t]he last Operator has left the Control Room, whichever comes first.

The first condition implies that as soon as control of the plant is no longer maintained in the Control Room, that the time period to establish control at the alternate location starts. It is not clear to the NRC staff whether this time should start "when control of the plant cannot be maintained." It appears that the second condition would provide a more clear and consistent start time for the declaration of EAL HS2. Provide clarification to address NRC staff's concern, or revise accordingly to provide a clear 30 minute start time that supports a timely and consistent event declaration.

Response

The phrase "Control of the plant..." was changed to "Control of needed safety functions..." to more clearly identify when the time to establish control of key safety functions starts.

RAI-10

The proposed EAL HU4.2.b, requiring validation of the seismic event, is not consistent with NEI 99-01, Revision 6. Specifically, the proposed EAL criterion HU4.2.b does not include that the occurrence of a seismic event is confirmed by the Shift Manager, as provided in the NEI 99-01, Revision 6, Developer's Notes.

a. *Add a condition that the Shift Manager confirms the occurrence of a seismic event, as provided by NEI 99-01, Revision 6, or provide further justification as to why this variance from endorsed guidance is acceptable.*

b. *Explain why the basis discussion includes typical lateral acceleration values instead of site-specific values, or revise accordingly.*

Response

a. The following bullet has been added to EAL HU4.2.b:

    - If the above bullets are not able to be confirmed, then the occurrence of a seismic event is confirmed in manner deemed appropriate by the Shift Manager or Emergency Director.

b. The typical lateral acceleration value was removed from the affected EAL Basis section. Site personnel will be able to readily feel and recognize a seismic event consistent with the operating basis earthquake as discussed in the Basis statement noted below:

> "Earthquakes of this magnitude should be readily felt by on-site personnel and recognized as a seismic event..."

RAI-11

The FitzPatrick EAL alternative method (e.g., wall board) for presenting EAL scheme information is not consistent with the proposed EAL Technical Basis document. For example, the FitzPatrick Technical Basis document threshold value for MA4 is ECCS Injection instead of ECCS Actuation as identified on the FitzPatrick EAL alternative method. This could lead to inaccurate or delayed emergency classifications. Explain how the method is technically accurate and addresses human factors issues that could impact timely and accurate EAL assessments.

Response

The Fitzpatrick EAL alternative method (e.g., wall board/procedure matrix) has been reviewed and revised to ensure consistency with the Fitzpatrick Technical Basis.

References

1. Letter from David T. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission - License Amendment Request to Adopt Emergency Action Level Schemes Pursuant to NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated January 31, 2018 (ML18037A786)

2. Electronic Mail Request from Tanya Hood (U.S. Nuclear Regulatory Commission) to Richard Gropp, et al. (Exelon Generation Company, LLC) – Draft RAIs - FitzPatrick - LAR to Adopt EAL Schemes Pursuant to NEI 99-01, Revision 6, dated June 7, 2018

3. Electronic Mail Request from Tanya Hood (U.S. Nuclear Regulatory Commission) to Bryan Hanson et al. (Exelon Generation Company, LLC) – FitzPatrick RAIs - LAR to Adopt EAL Schemes Pursuant to NEI 99-01, Revision 6, dated June 13, 2018 (ML18164A365)

ATTACHMENT 2

REVISED RADIOLOGICAL EMERGENCY PLAN INFORMATION

FOR

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

EP-AA-1014

Enclosures

- Enclosure 2B – Revised EAL Redline Basis Document Pages
- Enclosure 2C – Revised EAL Clean Basis Document Pages
- Enclosure 2E – Revised Procedure Matrix Pages

Enclosure 2B

Revised EAL Redline Basis Document Pages

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

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

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

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

OR

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**
• Reactor Building East Crescent • Reactor Building West Crescent • Reactor Building 272’ Elevation • Reactor Building 300’ Elevation • Relay Room • North Cable Room	Mode 3, 4, and 5

Basis:

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

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

Assuming all plant equipment is operating as designed, normal operation is capable from the Main Control Room (MCR). The plant is also able to transition into a hot shutdown condition from the MCR, therefore Table R4 is a list of plant rooms or areas with entry-related mode applicability that contain equipment which require a manual/local action necessary to transition the plant from normal plant operation to cooldown and shutdown as specified in normal operating procedures (establish shutdown cooling), where if this action is not completed the plant would not be able to attain and maintain cold shutdown. This Table does not include rooms or areas for which entry is required solely to perform actions of an administrative or record keeping nature (e.g., normal rounds or routine inspections).

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

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

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

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

Basis (cont):

- The increased radiation levels are a result of a planned activity that includes compensatory measures which address the temporary inaccessibility of a room or area (e.g., radiography, spent filter or resin transfer, etc.).

- The action for which room/area entry is required is of an administrative or record keeping nature (e.g., normal rounds or routine inspections).

- The access control measures are of a conservative or precautionary nature, and would not actually prevent or impede a required action.

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

Basis Reference(s):

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

RU3

Initiating Condition:

Reactor coolant activity greater than Technical Specification allowable limits.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

1. Offgas radiation ≥ **hi-hi alarm**

   OR

2. Specific coolant activity **> 2.0 µCi/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 R 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

CT3

Initiating Condition:

Primary Containment Pressure / Conditions

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. UNPLANNED rapid drop in Primary Containment pressure following Primary Containment pressure rise.

   OR

2. Primary Containment pressure response **not** consistent with LOCA conditions.

POTENTIAL LOSS

3. Primary Containment pressure **> 56 psig** ~~and rising~~.

   OR

4. a. Primary Containment hydrogen concentration **≥ 6%.**

      AND

   b. Primary Containment oxygen concentration **≥ 5%.**

   OR

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

Basis:

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

Loss Threshold #1 and #2 Basis

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

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

Basis (cont):

Potential Loss Threshold #3 Basis

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

Potential Loss Threshold #4 Basis

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

Potential Loss Threshold #5 Basis

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

Basis Reference(s):

1. 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
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

MA5

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains.
- If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted.
- If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.
- If a hazardous event occurs and it is determined that the conditions of MA5 are not met, then assess the event via HU3, HU4, or HU6.

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
   - Other events with similar hazard characteristics as determined by the Shift Manager

   AND

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

   AND

   c. **EITHER** of the following:
   - 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.

- ~~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.

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

a. **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

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

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 SAFETY SYSTEM performance in one train, and there must be either indications of performance issues with the second SAFETY SYSTEM train or VISIBLE DAMAGE to the second train such that the potential exists for this second SAFETY SYSTEM train to have performance issues. In other words, in order for this EAL to be classified, the hazardous event must occur, at least one SAFETY SYSTEM train must have indications of degraded performance, and the second SAFETY SYSTEM train must have indications of degraded performance or VISIBLE DAMAGE such that the potential exists for performance issues. Note that this second SAFETY SYSTEM train is from the same SAFETY SYSTEM that has degraded performance for criteria 1.b 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.

Indications of degraded performance address damage to a SAFETY SYSTEM train that is in operation since indications for it will be readily available. The indications of degraded performance should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

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 a hazardous event occurs and the EAL conditions of MA5 are not met then assess the event via HU3, HU4, or HU6.

~~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.~~

Basis (cont):

~~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.~~

Basis Reference(s):

1. NEI 99-01, Rev 6 SA9

Initiating Condition:

Loss of all onsite or offsite communication capabilities.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

1. Loss of **ALL** Table M3 onsite communication capabilities affecting the ability to perform routine operations.

   OR

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

   OR

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

Table M3 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
Installed Out-of-Plant Cellular Phones	X	X	X
Plant Satellite Phones (Installed in CR or deployable)		X	X
RECS		X	
Dedicated Phone Lines (ENS)		X	X
HPN and FTS 2001		X	X

Basis:

This IC addresses a significant loss of onsite, offsite, or NRC communication 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.).

Basis (cont):

EAL #1 Basis

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

EAL #2 Basis

Addresses a total loss of the communication 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 .

EAL #3 Basis

Addresses a total loss of the communication 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
11. JAFNPP TSC
12. JAFNPP EOF
13. SEMO Technical Resources
14. NEI 99-01 Rev 6, SU6

CA2

Initiating Condition:

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

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains.
- If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted.
- If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.
- If a hazardous event occurs and it is determined that the conditions of CA2 are not met, then assess the event via HU3, HU4, or HU6.

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
   - Other events with similar hazard characteristics as determined by the Shift Manager

   AND

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

   AND

   c. **EITHER** of the following:
   - 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.

- ~~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

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

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 SAFETY SYSTEM performance in one train, and there must be either indications of performance issues with the second SAFETY SYSTEM train or VISIBLE DAMAGE to the second train such that the potential exists for this second SAFETY SYSTEM train to have performance issues. In other words, in order for this EAL to be classified, the hazardous event must occur, at least one SAFETY SYSTEM train must have indications of degraded performance, and the second SAFETY SYSTEM train must have indications of degraded performance or VISIBLE DAMAGE such that the potential exists for performance issues. Note that this second SAFETY SYSTEM train is from the same SAFETY SYSTEM that has degraded performance for criteria 1.b 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.

Indications of degraded performance address damage to a SAFETY SYSTEM train that is in operation since indications for it will be readily available. The indications of degraded performance should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

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 a hazardous event occurs and the EAL conditions of MA5 are not met then assess the event via HU3, HU4, or HU6.

~~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.~~

Basis (cont):

~~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.~~

Basis Reference(s):

1. NEI 99-01, Rev 6 CA6

Initiating Condition:

Loss of all onsite or offsite communication 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
Installed Out-of-Plant Cellular Phones	X	X	X
Plant Satellite Phones (Installed in CR and deployable)		X	X
RECS		X	
Dedicated Phone Lines (ENS)		X	X
HPN and FTS 2001		X	X

Basis:

This IC addresses a significant loss of onsite, offsite, or NRC communication 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.).

Basis (cont):

EAL #1 Basis

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

EAL #2 Basis

Addresses a total loss of the communication 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.

EAL #3 Basis

Addresses a total loss of the communication 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
11. JAFNPP TSC
12. JAFNPP EOF
13. SEMO Technical Resources
14. NEI 99-01 Rev 6, CU5

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~~ Supervisor that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.

Basis:

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

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

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

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

HOSTILE FORCE: 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.

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

Basis (cont):

As time and conditions allow, these events require a heightened state of readiness by the plant staff and implementation of onsite protective measures (e.g., evacuation, dispersal or sheltering). The Site Area Emergency declaration will mobilize 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.

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

Basis Reference(s):

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

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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

   OR

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

Basis:

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

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

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

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

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

HOSTILE FORCE: 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

Basis (cont):

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

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

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

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

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

Basis Reference(s):

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

Initiating Condition:

Confirmed SECURITY CONDITION or threat.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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

   OR

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

   OR

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

Basis:

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

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

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

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

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

This IC addresses events that pose a threat to plant personnel or SAFETY SYSTEM equipment, and thus represent a potential degradation in the level of plant safety. Security events which do not meet one of these EALs are adequately addressed by the

Basis (cont):

requirements of 10 CFR § 73.71 or 10 CFR § 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under ICs HA1, and HS1.

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.

EAL #2 Basis

Addresses the threat from the impact of an aircraft on the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may also be provided by NORAD through the NRC. Validation of the threat is performed in accordance with AOP-70, Airborne Security.

EAL #3 Basis

References Security Force because these are the individuals trained to confirm that a security event is occurring or has occurred. Training on security event confirmation and classification is controlled due to the nature of Safeguards and 10 CFR § 2.39 information.

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

Basis Reference(s):

1. 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

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

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

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

   AND

2. Control of **ANY** Table H1 key safety function is not reestablished in **< 30 minutes**.

Table H1 Safety Functions
• 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)

Basis:

The time period to establish control of the plant starts when either:

a. Control of ~~the plant~~needed safety functions 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 any fission product barrier within a relatively short period of time.

Basis (cont):

The determination of whether or not “control” is established at the remote safe shutdown location(s) is based on Emergency Director judgment. The Emergency Director is expected to make a reasonable, informed judgment within 30 minutes whether or not the operating staff has control of key safety functions from the remote safe shutdown location(s).

Escalation of the emergency classification level would be via IC FG1 or CG6.

Basis Reference(s):

1. AOP-43 Plant Shutdown from Outside the Control Room
2. NEI 99-01, Rev 6 HS6

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.
      - If the above bullets are not able to be confirmed, then the occurrence of a seismic event is confirmed in a manner deemed appropriate by the Shift Manager or Emergency Director.

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 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 CA2 or MA5.

[1] An OBE is vibratory ground motion for which those features of a nuclear power plant necessary for continued operation without undue risk to the health and safety of the public will remain functional.

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

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

Enclosure 2C

Revised EAL Clean Basis Document Pages

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

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

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

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

OR

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**
• Reactor Building East Crescent • Reactor Building West Crescent • Reactor Building 272’ Elevation • Reactor Building 300’ Elevation • Relay Room • North Cable Room	Mode 3, 4, and 5

Basis:

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

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

Assuming all plant equipment is operating as designed, normal operation is capable from the Main Control Room (MCR). The plant is also able to transition into a hot shutdown condition from the MCR, therefore Table R4 is a list of plant rooms or areas with entry-related mode applicability that contain equipment which require a manual/local action necessary to transition the plant from normal plant operation to cooldown and shutdown as specified in normal operating procedures (establish shutdown cooling), where if this action is not completed the plant would not be able to attain and maintain cold shutdown. This Table does not include rooms or areas for which entry is required solely to perform actions of an administrative or record keeping nature (e.g., normal rounds or routine inspections).

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

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

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

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

Basis (cont):

- The increased radiation levels are a result of a planned activity that includes compensatory measures which address the temporary inaccessibility of a room or area (e.g., radiography, spent filter or resin transfer, etc.).

- The action for which room/area entry is required is of an administrative or record keeping nature (e.g., normal rounds or routine inspections).

- The access control measures are of a conservative or precautionary nature, and would not actually prevent or impede a required action.

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

Basis Reference(s):

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

RU3

Initiating Condition:

Reactor coolant activity greater than Technical Specification allowable limits.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

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

   OR

2. Specific coolant activity **> 2.0 µCi/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.

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

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

Basis Reference(s):

1. 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

CT3

Initiating Condition:

Primary Containment Pressure / Conditions

Operating Mode Applicability:

1, 2, 3

Fission Product Barrier (FPB) Threshold:

LOSS

1. UNPLANNED rapid drop in Primary Containment pressure following Primary Containment pressure rise.

   OR

2. Primary Containment pressure response **not** consistent with LOCA conditions.

POTENTIAL LOSS

3. Primary Containment pressure **> 56 psig**.

   OR

4. a. Primary Containment hydrogen concentration **≥ 6%.**

      AND

   b. Primary Containment oxygen concentration **≥ 5%.**

   OR

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

Basis:

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

Loss Threshold #1 and #2 Basis

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

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

Basis (cont):

Potential Loss Threshold #3 Basis

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

Potential Loss Threshold #4 Basis

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

Potential Loss Threshold #5 Basis

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

Basis Reference(s):

1. 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
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

MA5

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

Note:

- This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains.
- If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted.
- If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.
- If a hazardous event occurs and it is determined that the conditions of MA5 are not met, then assess the event via HU3, HU4, or HU6.

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
   - Other events with similar hazard characteristics as determined by the Shift Manager

   AND

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

   AND

   c. **EITHER** of the following:
   - 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.

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 SAFETY SYSTEM performance in one train, and there must be either indications of performance issues with the second SAFETY SYSTEM train or VISIBLE DAMAGE to the second train such that the potential exists for this second SAFETY SYSTEM train to have performance issues. In other words, in order for this EAL to be classified, the hazardous event must occur, at least one SAFETY SYSTEM train must have indications of degraded performance, and the second SAFETY SYSTEM train must have indications of degraded performance or VISIBLE DAMAGE such that the potential exists for performance issues. Note that this second SAFETY SYSTEM train is from the same SAFETY SYSTEM that has degraded performance for criteria 1.b 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.

Indications of degraded performance address damage to a SAFETY SYSTEM train that is in operation since indications for it will be readily available. The indications of degraded performance should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

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.

Basis (cont):

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

Basis Reference(s):

1. NEI 99-01, Rev 6 SA9

Initiating Condition:

Loss of all onsite or offsite communication capabilities.

Operating Mode Applicability:

1, 2, 3

Emergency Action Level (EAL):

1. Loss of **ALL** Table M3 onsite communication capabilities affecting the ability to perform routine operations.

   OR

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

   OR

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

Table M3 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
Installed Out-of-Plant Cellular Phones	X	X	X
Plant Satellite Phones (Installed in CR and deployable)		X	X
RECS		X	
Dedicated Phone Lines (ENS)		X	X
HPN and FTS 2001		X	X

Basis:

This IC addresses a significant loss of onsite, offsite, or NRC communication 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.).

Basis (cont):

EAL #1 Basis

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

EAL #2 Basis

Addresses a total loss of the communication 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.

EAL #3 Basis

Addresses a total loss of the communication 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
11. JAFNPP TSC
12. JAFNPP EOF
13. SEMO Technical Resources
14. NEI 99-01 Rev 6, SU6

CA2

Initiating Condition:

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

Operating Mode Applicability:

4, 5

Emergency Action Level (EAL):

Note:

- This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains.
- If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted.
- If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.
- If a hazardous event occurs and it is determined that the conditions of CA2 are not met, then assess the event via HU3, HU4, or HU6.

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
   - Other events with similar hazard characteristics as determined by the Shift Manager

   AND

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

   AND

   c. **EITHER** of the following:
   - 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.

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 SAFETY SYSTEM performance in one train, and there must be either indications of performance issues with the second SAFETY SYSTEM train or VISIBLE DAMAGE to the second train such that the potential exists for this second SAFETY SYSTEM train to have performance issues. In other words, in order for this EAL to be classified, the hazardous event must occur, at least one SAFETY SYSTEM train must have indications of degraded performance, and the second SAFETY SYSTEM train must have indications of degraded performance or VISIBLE DAMAGE such that the potential exists for performance issues. Note that this second SAFETY SYSTEM train is from the same SAFETY SYSTEM that has degraded performance for criteria 1.b 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.

Indications of degraded performance address damage to a SAFETY SYSTEM train that is in operation since indications for it will be readily available. The indications of degraded performance should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

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.

Basis (cont):

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

Basis Reference(s):

1. NEI 99-01, Rev 6 CA6

CU4

Initiating Condition:

Loss of all onsite or offsite communication 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
Installed Out-of-Plant Cellular Phones	X	X	X
Plant Satellite Phones (Installed in CR and deployable)		X	X
RECS		X	
Dedicated Phone Lines (ENS)		X	X
HPN and FTS 2001		X	X

Basis:

This IC addresses a significant loss of onsite, offsite, or NRC communication 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.).

Basis (cont):

EAL #1 Basis

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

EAL #2 Basis

Addresses a total loss of the communication 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.

EAL #3 Basis

Addresses a total loss of the communication 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
11. JAFNPP TSC
12. JAFNPP EOF
13. SEMO Technical Resources
14. NEI 99-01 Rev 6, CU5

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 Supervisor that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.

Basis:

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

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

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

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

HOSTILE FORCE: 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.

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

Basis (cont):

As time and conditions allow, these events require a heightened state of readiness by the plant staff and implementation of onsite protective measures (e.g., evacuation, dispersal or sheltering). The Site Area Emergency declaration will mobilize 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.

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

Basis Reference(s):

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

HA1

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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

   OR

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

Basis:

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

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

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

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

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

HOSTILE FORCE: 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

Basis (cont):

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

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

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

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

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

Basis Reference(s):

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

HU1

Initiating Condition:

Confirmed SECURITY CONDITION or threat.

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

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

   OR

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

   OR

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

Basis:

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

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

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

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

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

This IC addresses events that pose a threat to plant personnel or SAFETY SYSTEM equipment, and thus represent a potential degradation in the level of plant safety. Security events which do not meet one of these EALs are adequately addressed by the

Basis (cont):

requirements of 10 CFR § 73.71 or 10 CFR § 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under ICs HA1, and HS1.

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.

EAL #2 Basis

Addresses the threat from the impact of an aircraft on the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may also be provided by NORAD through the NRC. Validation of the threat is performed in accordance with AOP-70, Airborne Security.

EAL #3 Basis

References Security Force because these are the individuals trained to confirm that a security event is occurring or has occurred. Training on security event confirmation and classification is controlled due to the nature of Safeguards and 10 CFR § 2.39 information.

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

Basis Reference(s):

1. 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

Initiating Condition:

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

Operating Mode Applicability:

1, 2, 3, 4, 5, D

Emergency Action Level (EAL):

Note:

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

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

   AND

2. Control of **ANY** Table H1 key safety function is not reestablished in **< 30 minutes**.

Table H1 Safety Functions
• 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)

Basis:

The time period to establish control of the plant starts when either:

a. Control of needed safety functions 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 any fission product barrier within a relatively short period of time.

Basis (cont):

The determination of whether or not “control” is established at the remote safe shutdown location(s) is based on Emergency Director judgment. The Emergency Director is expected to make a reasonable, informed judgment within 30 minutes whether or not the operating staff has control of key safety functions from the remote safe shutdown location(s).

Escalation of the emergency classification level would be via IC FG1 or CG6.

Basis Reference(s):

1. AOP-43 Plant Shutdown from Outside the Control Room
2. NEI 99-01, Rev 6 HS6

HU4

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.
      - If the above bullets are not able to be confirmed, then the occurrence of a seismic event is confirmed in a manner deemed appropriate by the Shift Manager or Emergency Director.

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 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. 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 CA2 or MA5.

[1] An OBE is vibratory ground motion for which those features of a nuclear power plant necessary for continued operation without undue risk to the health and safety of the public will remain functional.

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

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

Enclosure 2E

Revised Procedure Matrix Pages

Abnormal Rad Levels / Radiological Effluents

Radiological Effluents

GENERAL EMERGENCY

RG1 1 2 3 4 5 D

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

Emergency Action Level (EAL):

Notes:

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

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

SITE AREA EMERGENCY

RS1 1 2 3 4 5 D

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

Emergency Action Level (EAL):

Notes:

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

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

ALERT

RA1 1 2 3 4 5 D

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

Emergency Action Level (EAL):

Notes:

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

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

UNUSUAL EVENT

RU1 1 2 3 4 5 D

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

Emergency Action Level (EAL):

Notes:

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

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

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

Table R1 Effluent Monitor Thresholds				
Effluent Monitor	**General Emergency**	**Site Area Emergency**	**Alert**	**Unusual Event**
Stack	7880 mR/hr	788 mR/hr	78.8 mR/hr	0.451 mR/hr (High Range Monitor)
Rx Bldg Exh	N/A	N/A	N/A	9.50E+05 cpm (Low Range Monitor)
Turb Bldg Exh	2.44 mR/hr	0.244 mR/hr	N/A	6.72E+05 cpm (Low Range Monitor)
Radw Bldg Exh	4.74 mR/hr	0.474 mR/hr	N/A	N/A
Refuel Floor Exh	N/A	N/A	N/A	9.28E+05 cpm (Low Range Monitor)

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Abnormal Rad Levels / Radiological Effluents			

Radiological Effluents

RG2 1 2 3 4 5 D

Spent fuel pool level cannot be restored to at least 1.00 foot for 60 minutes or longer.

Emergency Action Levels (EAL):

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

Spent fuel pool level cannot be restored to at least **1.00 foot** as indicated on19LI-60A or 19LI-60B for **≥ 60 minutes**.

Table R3
Areas Requiring Continuous Occupancy

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

RS2 1 2 3 4 5 D

Spent fuel pool level at 1.00 foot.

Emergency Action Level (EAL):

Lowering of spent fuel pool level to **1.00 foot** as indicated on 19LI-60A or 19LI-60B.

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

Table R4
Areas with Entry Related Mode Applicability

Area	Entry Related Mode Applicability
• Reactor Building East Crescent • Reactor Building West Crescent • Reactor Building 272’ Elevation • Reactor Building 300’ Elevation • Relay Room • North Cable Room	Mode 3, 4, and 5

RA2 1 2 3 4 5 D

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

Emergency Action Level (EAL):

1. Uncovery of irradiated fuel in the REFUELING PATHWAY.

   OR

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

   OR

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

RA3 1 2 3 4 5 D

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

Emergency Action Level (EAL):

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

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

   OR

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

RU2 1 2 3 4 5 D

UNPLANNED loss of water level above irradiated fuel.

Emergency Action Level (EAL):

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.

RU3 1 2 3

Reactor coolant activity greater than Technical Specification allowable limits.

Emergency Action Level (EAL):

1 Offgas radiation **≥ hi-hi alarm**

OR

2. Specific coolant activity **> 2.0 µCi/gm** I-131 dose equivalent.

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

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

Sub-Category	FC – Fuel Clad		RC – Reactor Coolant System		CT - Containment	
	Loss	**Potential Loss**	**Loss**	**Potential Loss**	**Loss**	**Potential Loss**
1. RCS Activity	Coolant activity **> 300 uCi/gm** I-131 dose equivalent.	None	None	None	None	None
2. RPV Water Level	1. SAOG entry required	2. RPV water level **cannot** be restored and maintained **> 0 inches** (TAF). **OR** 3. RPV water level **cannot** be determined.	1. RPV water level **cannot** be restored and maintained **> 0 inches** (TAF). **OR** 2. RPV water level **cannot** be determined.	None	None	SAOG entry required
3. Primary Containment Pressure / Conditions	None	None	1. a. Primary Containment pressure **> 2.7 psig.** **AND** b. Primary Containment pressure rise is due to RCS leakage.	None	1. UNPLANNED rapid drop in Primary Containment pressure following Primary Containment pressure rise. **OR** 2. Primary Containment pressure response **not** consistent with LOCA conditions.	3. Primary Containment pressure **> 56 psig**. **OR** 4. a. Primary Containment hydrogen concentration **≥ 6%.** **AND** b. Primary Containment oxygen concentration **≥ 5%.** **OR** 5. Heat Capacity Temperature Limit (HCTL) (EOP-11) exceeded.
4. RCS Leak Rate	None	None	1. UNISOLABLE Main Steam Line (MSL), HPCI, RWCU, RCIC, or Feedwater line break. **OR** 2. Emergency RPV Depressurization is required.	3. UNISOLABLE primary system leakage that results in **EITHER** of the following: a. Secondary Containment area temperature > **EOP-5 Maximum Normal** Operating Limit. **OR** b. Secondary Containment area radiation > **EOP-5 Maximum Normal** Operating Limit.	None	None
5. Primary Containment Radiation	Drywell radiation monitor reading **> 1.8E+03 R/hr (1800 R/hr).**	None	Drywell radiation monitor reading **> 63 R/hr.**	None	None	Drywell radiation monitor reading **> 1.8E+04 R/hr (18,000 R/hr).**
6. Primary Containment Isolation Failure	None	None	None	None	1. UNISOLABLE direct downstream pathway to the environment exists after Primary Containment isolation signal. **OR** 2. Intentional Primary Containment venting or purging per EOPs or SAOGs due to accident conditions. **OR** 3. 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.	None
7. Emergency Director Judgment	1. Any Condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier.	2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.	1. Any Condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.	2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.	1. Any Condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.	2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.

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

System Malfunction

Loss of AC Power

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
MG1 1 2 3 Prolonged loss of all offsite and all onsite AC power to emergency buses. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. Loss of **ALL** offsite and onsite AC power to 4160 V emergency buses 10500 and 10600. **AND** 2. **EITHER** of the following: a. Restoration of at least one 4160 V emergency bus 10500 or 10600 in **< 4 hours** is **not** likely. **OR** b. RPV water level **cannot** be restored and maintained **> -19 inches (MSCRWL).**	**MS1** 1 2 3 Loss of all offsite and onsite AC power to emergency buses for 15 minutes or longer. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. Loss of **ALL** offsite 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.	**MA1** 1 2 3 Loss of all but one AC power source to emergency buses for 15 minutes or longer. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. AC power capability to 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 **AND** 2. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMS.	**MU1** 1 2 3 Loss of all offsite AC power capability to emergency buses for 15 minutes or longer. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Loss of **ALL** offsite AC power capability 4160 V emergency buses 10500 and 10600 for **≥ 15 minutes**. • Reserve Station Transformer T-2 • Reserve Station Transformer T-3 • Station Service Transformer T-4 (While backfeeding from Main Transformer)

Loss of DC Power

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
MG2 1 2 3 Loss of all AC and Vital DC power sources for 15 minutes or longer. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. Loss of **ALL** offsite 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. All** AC and Vital DC power sources in EALs #1 and #2 have been lost for **≥ 15 minutes.**	**MS2** 1 2 3 Loss of all Vital DC power for 15 minutes or longer. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Voltage is **< 105 VDC** on Vital DC buses 71BCB-2A and 71BCB-2B for **≥ 15 minutes**.		

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
System Malfunction			
RPS Failure	**MS3** 1 2 Inability to shutdown the reactor causing a challenge to RPV water level or RCS heat removal. **Emergency Action Level (EAL):** 1. Automatic scram did **not** shutdown the reactor as indicated by Reactor Power **≥ 2.5%**. **AND** 2. **ALL** manual / ARI actions to shutdown the reactor have been unsuccessful as indicated by Reactor Power **≥ 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.	**MA3** 1 2 Automatic or manual scram fails to shutdown the reactor, and subsequent manual actions taken at the Reactor Control Console are not successful in shutting down the reactor. **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 does not include manually driving in control rods or implementation of boron injection strategies. 1. Automatic or manual scram did **not** shutdown the reactor as indicated by Reactor Power **≥ 2.5%**. **AND** 2. Manual / ARI actions taken at the Reactor Control Console are **not** successful in shutting down the reactor as indicated by Reactor Power **≥ 2.5%**.	**MU3** 1 2 Automatic or manual scram fails to shutdown the reactor. **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 does not include manually driving in control rods or implementation of boron injection strategies. 1. a. Automatic scram did **not** shutdown the reactor as indicated by Reactor Power **≥ 2.5%**. **AND** b. Subsequent manual / ARI action taken at the Reactor Control Console is successful in shutting down the reactor as indicated by Reactor Power **< 2.5%.** **OR** 2. a. Manual scram did **not** shutdown the reactor as indicated by Reactor Power **≥ 2.5%**. **AND** b. **EITHER** of the following: 1. Subsequent manual / ARI action taken at the Reactor Control Console is successful in shutting down the reactor as indicated by Reactor Power **< 2.5%.** **OR** 2. Subsequent automatic scram / ARI is successful in shutting down the reactor as indicated by Reactor Power **< 2.5%.**
Control Room Indications **Table M1 Control Room Parameters** • Reactor Power • RPV Water Level • RPV Pressure • Primary Containment Pressure • Torus Level • Torus Temperature	**Table M2 Significant Transients** • 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)	**MA4** 1 2 3 UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. UNPLANNED event results in the inability to monitor **ANY** Table M1 parameter from within the Control Room for **≥ 15 minutes.** **AND** 2. **ANY** Table M2 transient in progress.	**MU4** 1 2 3 UNPLANNED loss of Control Room indications for 15 minutes or longer. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. UNPLANNED event results in the inability to monitor **ANY** Table M1 parameter from within the Control Room for **≥ 15 minutes.**

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
System Malfunction			
Hazard affects Safety System		**MA5** 1 2 3 Hazardous event affecting a SAFETY SYSTEM required for the current operating mode. **Emergency Action Level (EAL):** **Note:** • This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains. • If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted. • If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted. • If a hazardous event occurs and it is determined that the conditions of MA5 are not met, then assess the event via HU3, HU4, or HU6. 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 • Other events with similar hazard characteristics as determined by the Shift Manager **AND** b. Event damage has caused indications of degraded performance to one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode. **AND** c. **EITHER** of the following: • 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.	

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

System Malfunction

MU6 1 2 3

RCS leakage for 15 minutes or longer.

Emergency Action Level (EAL):

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

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

   OR

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

   OR

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

Communications

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
Installed Out-of-Plant Cellular Phones	X	X	X
Plant Satellite Phones (Installed in CR and deployable)		X	X
RECS		X	
Dedicated Phone Lines (ENS)		X	X
HPN and FTS 2001		X	X

MU7 1 2 3

Loss of all onsite or offsite communication capabilities.

Emergency Action Level (EAL):

1. Loss of **ALL** Table M3 onsite communication capabilities affecting the ability to perform routine operations.

   OR

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

   OR

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

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Hostile Action	**HS1** 1 2 3 4 5 D HOSTILE ACTION within the PROTECTED AREA. **Emergency Action Level (EAL):** A notification from the Security Supervisor that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.	**HA1** 1 2 3 4 5 D HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes. **Emergency Action Level (EAL):** 1. A validated notification from NRC from an aircraft attack threat **< 30 minutes** of the site. **OR** 2. Notification by the Security Supervisor that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA.	**HU1** 1 2 3 4 5 D Confirmed SECURITY CONDITION or threat. **Emergency Action Level (EAL):** 1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities. **OR** 2. A validated notification from the NRC providing information of an aircraft threat. **OR** 3. Notification by the Security Supervisor of a SECURITY CONDITION that does **not** involve a HOSTILE ACTION.
Transfer of Plant Control **Table H1 Safety Functions** • Reactivity Control (ability to shutdown the reactor and keep it shutdown) • RPV Water Level (ability to cool the core) • RCS Heat Removal (ability to maintain heat sink)	**HS2** 1 2 3 4 5 D Inability to control a key safety function from outside the Control Room. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per AOP-43, Plant Shutdown from Outside the Control Room. **AND** 2. Control of **ANY** Table H1 key safety function is **not** reestablished in **< 30 minutes**.	**HA2** 1 2 3 4 5 D Control Room evacuation resulting in transfer of plant control to alternate locations. **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.	

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

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

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Earthquake			**HU4** 1 2 3 4 5 D Seismic event greater than OBE levels. **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. • If the above bullets are not able to be confirmed, then the occurrence of a seismic event is confirmed in a manner deemed appropriate by the Shift Manager or Emergency Director.

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Toxic Gas	**Table H3** **Areas with Entry Related Mode Applicability** **Area**: • Reactor Building East Crescent • Reactor Building West Crescent • Reactor Building 272' Elevation • Reactor Building 300' Elevation • Relay Room • North Cable Room **Entry Related Mode Applicability**: Mode 3, 4, and 5	**HA5** 3 4 5 Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown. **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. **AND** 2. Entry into the room or area is prohibited or impeded.	
Hazardous Event			**HU6** 1 2 3 4 5 D Hazardous Event **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 **≤ 237 feet**.

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Emergency Director Judgment **HG7** 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of a GENERAL EMERGENCY. **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	**HS7** 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of a SITE AREA EMERGENCY. **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts, (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.	**HA7** 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT. **Emergency Action Level (EAL):** Other conditions exist which, in the judgment of the Emergency Director, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	**HU7** 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT. **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

ISFSI Malfunction

ISFSI

E-HU1 1 2 3 4 5 D

Damage to a loaded cask CONFINEMENT BOUNDARY.

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
		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
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		

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

Abnormal Rad Levels / Radiological Effluents

Radiological Effluents

GENERAL EMERGENCY

RG1 1 2 3 4 5 D

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

Emergency Action Level (EAL):

Notes:

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

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

   OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:
   a. **> 1000 mRem TEDE**

      OR

   b. **> 5000 mRem CDE Thyroid**

   OR

3. Field survey results at or beyond the site boundary indicate **EITHER**:
   a. Gamma (closed window) dose rates **> 1000 mR/hr** are expected to continue for **≥ 60 minutes**.

      OR

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

SITE AREA EMERGENCY

RS1 1 2 3 4 5 D

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

Emergency Action Level (EAL):

Notes:

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

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

   OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:
   a. **> 100 mRem TEDE**

      OR

   b. **> 500 mRem CDE Thyroid**

   OR

3. Field survey results at or beyond the site boundary indicate **EITHER**:
   a. Gamma (closed window) dose rates **> 100 mR/hr** are expected to continue for **≥ 60 minutes**.

      OR

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

ALERT

RA1 1 2 3 4 5 D

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

Emergency Action Level (EAL):

Notes:

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

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

   OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:
   a. **> 10 mRem TEDE**

      OR

   b. **> 50 mRem CDE Thyroid**

   OR

3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than **EITHER** of the following at or beyond the site boundary
   a. **10 mRem TEDE** for **60 minutes** of exposure

      OR

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

   OR

4. Field survey results at or beyond the site boundary indicate **EITHER**:
   a. Gamma (closed window) dose rates **> 10 mR/hr** are expected to continue for **≥ 60 minutes**.

      OR

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

UNUSUAL EVENT

RU1 1 2 3 4 5 D

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

Emergency Action Level (EAL):

Notes:

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

1. Reading on 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**.

   OR

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

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

Table R1 Effluent Monitor Thresholds				
Effluent Monitor	**General Emergency**	**Site Area Emergency**	**Alert**	**Unusual Event**
Stack	7880 mR/hr	788 mR/hr	78.8 mR/hr	0.451 mR/hr (High Range Monitor)
Rx Bldg Exh	N/A	N/A	N/A	9.50E+05 cpm (Low Range Monitor)
Turb Bldg Exh	2.44 mR/hr	0.244 mR/hr	N/A	6.72E+05 cpm (Low Range Monitor)
Radw Bldg Exh	4.74 mR/hr	0.474 mR/hr	N/A	N/A
Refuel Floor Exh	N/A	N/A	N/A	9.28E+05 cpm (Low Range Monitor)

Abnormal Rad Levels / Radiological Effluents

Radiological Effluents

GENERAL EMERGENCY

RG2 1 2 3 4 5 D

Spent fuel pool level cannot be restored to at least 1.00 foot for 60 minutes or longer.

Emergency Action Levels (EAL):

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

Spent fuel pool level cannot be restored to at least **1.00 foot** as indicated on 19LI-60A or 19LI-60B for **≥ 60 minutes**.

Table R3
Areas Requiring Continuous Occupancy

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

SITE AREA EMERGENCY

RS2 1 2 3 4 5 D

Spent fuel pool level at 1.00 foot.

Emergency Action Level (EAL):

Lowering of spent fuel pool level to **1.00 foot** as indicated on 19LI-60-A or 19LI-60B.

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

Table R4
Areas with Entry Related Mode Applicability

Area	Entry Related Mode Applicability
• Reactor Building East Crescent • Reactor Building West Crescent • Reactor Building 272’ Elevation • Reactor Building 300’ Elevation • Relay Room • North Cable Room	Mode 3, 4, and 5

ALERT

RA2 1 2 3 4 5 D

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

Emergency Action Level (EAL):

1. Uncovery of irradiated fuel in the REFUELING PATHWAY.

   OR

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

   OR

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

RA3 1 2 3 4 5 D

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

Emergency Action Level (EAL):

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

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

   OR

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

UNUSUAL EVENT

RU2 1 2 3 4 5 D

UNPLANNED loss of water level above irradiated fuel.

Emergency Action Level (EAL):

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.

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Cold Shutdown / Refueling System Malfunctions			
Loss of AC Power		**CA1** 4 5 D Loss of all offsite and all onsite AC power to emergency buses for 15 minutes or longer. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. Loss of **ALL** offsite 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.	**CU1** 4 5 D Loss of all but one AC power source to emergency buses for 15 minutes or longer. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. AC power capability to 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 **AND** 2. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMS.

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Cold Shutdown / Refueling System Malfunctions			
Safety System		**CA2** 4 5 Hazardous event affecting SAFETY SYSTEM required for the current operating mode. **Emergency Action Level (EAL):** **Note:** • This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains. • If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted. • If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted. • If a hazardous event occurs and it is determined that the conditions of CA2 are not met, then assess the event via HU3, HU4, or HU6. 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 • Other events with similar hazard characteristics as determined by the Shift Manager **AND** b. Event damage has caused indications of degraded performance to one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode. **AND** c. **EITHER** of the following: • 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.	

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

Cold Shutdown / Refueling System Malfunctions

DC Power

GENERAL EMERGENCY

SITE AREA EMERGENCY

ALERT

UNUSUAL EVENT

CU3 4 5

Loss of Vital DC power for 15 minutes or longer.

Emergency Action Level (EAL):

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

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

Communications

GENERAL EMERGENCY

SITE AREA EMERGENCY

ALERT

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
Installed Out-of-Plant Cellular Phones	X	X	X
Plant Satellite Phones (Installed in CR and deployable)		X	X
RECS		X	
Dedicated Phone Lines (ENS)		X	X
HPN and FTS 2001		X	X

UNUSUAL EVENT

CU4 4 5 D

Loss of all onsite or offsite communication capabilities.

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.

Heat Sink

GENERAL EMERGENCY

SITE AREA EMERGENCY

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.

ALERT

CA5 4 5

Inability to maintain the plant in cold shutdown.

Emergency Action Levels (EAL):

Note:

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

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

   OR

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

UNUSUAL EVENT

CU5 4 5

UNPLANNED rise in RCS temperature.

Emergency Action Levels (EAL):

Note:

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

1. UNPLANNED rise in RCS temperature **> 212 ºF.**

   OR

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

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

Cold Shutdown / Refueling System Malfunctions

RCS Leakage / Inventory

GENERAL EMERGENCY

CG6 4 5

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

Emergency Action Level (EAL):

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

1 a. RPV water level **< 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 uncovery is indicated by **ANY** of the following:

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

  OR

- 18RIA-052-30 Refuel Floor West (EPIC A-1247) Rad monitor **≥ 3 R/hr.**

AND

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

SITE AREA EMERGENCY

CS6 4 5

Loss of RPV inventory affecting core decay heat removal capability.

Emergency Action Level (EAL):

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

1. With CONTAINMENT CLOSURE **not** established, RPV water level **< 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 uncovery is indicated by **ANY** of the following:

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

     OR

   - 18RIA-052-30 Refuel Floor West (EPIC A-1247) Rad monitor **≥ 3 R/hr.**

Table C3 Indications of RCS Leakage

- 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

ALERT

CA6 4 5

Loss of RPV inventory.

Emergency Action Level (EAL):

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

1. Loss of RPV inventory as indicated by level **< 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 C4 Containment Challenge Indications

- Primary Containment Hydrogen Concentration **≥ 6%** and Oxygen **≥ 5%**
- UNPLANNED rise in 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 uncovery time limit, then escalation to a General Emergency is **not** required.

UNUSUAL EVENT

CU6 4 5

UNPLANNED loss of RP inventory for 15 minutes or longer.

Emergency Action Level (EAL):

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

1. UNPLANNED loss of reactor coolant results in the inability to restore and maintain RPV 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.

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Hostile Action	**HS1** 1 2 3 4 5 D HOSTILE ACTION within the PROTECTED AREA. **Emergency Action Level (EAL):** A notification from the Security Supervisor that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.	**HA1** 1 2 3 4 5 D HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes. **Emergency Action Level (EAL):** 1. A validated notification from NRC of an aircraft attack threat **< 30 minutes** from the site. **OR** 2. Notification by the Security Supervisor that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA.	**HU1** 1 2 3 4 5 D Confirmed SECURITY CONDITION or threat. **Emergency Action Level (EAL):** 1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities. **OR** 2. A validated notification from the NRC providing information of an aircraft threat. **OR** 3. Notification by the Security Supervisor of a SECURITY CONDITION that does **not** involve a HOSTILE ACTION.
Transfer of Plant Control **Table H1 Safety Functions** • Reactivity Control (ability to shutdown the reactor and keep it shutdown) • RPV Water Level (ability to cool the core) • RCS Heat Removal (ability to maintain heat sink)	**HS2** 1 2 3 4 5 D Inability to control a key safety function from outside the Control Room. **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per AOP-43, Plant Shutdown from Outside the Control Room. **AND** 2. Control of **ANY** Table H1 key safety function is **not** reestablished in **< 30 minutes**.	**HA2** 1 2 3 4 5 D Control Room evacuation resulting in transfer of plant control to alternate locations. **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.	

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

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

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Earthquake			**HU4** 1 2 3 4 5 D Seismic event greater than OBE levels. **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. • If the above bullets are not able to be confirmed, then the occurrence of a seismic event is confirmed in a manner deemed appropriate by the Shift Manager or Emergency Director.

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety			
Toxic Gas	**Table H3** **Areas with Entry Related Mode Applicability** **Area**: • Reactor Building East Crescent • Reactor Building West Crescent • Reactor Building 272' Elevation • Reactor Building 300' Elevation • Relay Room • North Cable Room **Entry Related Mode Applicability**: Mode 3, 4, and 5	**HA5** 3 4 5 Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown. **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. **AND** 2. Entry into the room or area is prohibited or impeded	
Hazardous Event			**HU6** 1 2 3 4 5 D Hazardous Event **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 **<u>≤</u> 237 feet**.

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

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Emergency Director Judgment	**HG7** 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of a GENERAL EMERGENCY. **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	**HS7** 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of a SITE AREA EMERGENCY. **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts, (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.	**HA7** 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT. **Emergency Action Level (EAL):** Other conditions exist which, in the judgment of the Emergency Director, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	**HU7** 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT. **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

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

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
ISFSI Malfunction			
ISFSI			**E-HU1** 1 2 3 4 5 D Damage to a loaded cask CONFINEMENT BOUNDARY. **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
		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
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		

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