

Emergency Preparedness Frequently Asked Questions (EPFAQ) 2014-003 Final Response

Question (Reference 1):

Is it appropriate to change emergency action levels (EALs) for Permanently Defueled (PD)-AU1 and PD-AA1 as follows?

- PD-AU1: Revise the Initiating Condition (IC) to "An uncontrolled release of gaseous or liquid radioactivity for 60 minutes or longer. Also, revise EAL #1 to "Reading on any effluent radiation monitor that is greater than the reading shown for 60 minutes or longer."
- PD-AA1: Revise the IC to "An uncontrolled release of gaseous or liquid radioactivity resulting in detectable levels at the site boundary." Also, remove EALs #2 and #4, and revise EAL #3 to allow for licensees to consider alternatives to the guidance provided in Nuclear Energy Institute (NEI) 99-01, Revision 6.

Proposed Solution:

N/A

U.S. Nuclear Regulatory Commission (NRC) Response:

While the PD EALs listed in NEI 99-01, Revision 6, (Reference #2), are acceptable, licensees may consider the attached PD EALs when developing EALs applicable to PD reactors, (i.e., with fuel in the spent fuel pool and not in the reactor vessel). This is considered a DIFFERENCE in accordance with Regulatory Issue Summary 2003-18, with Supplements 1 and 2 (Reference #3).

The regulatory process for licensees to follow when making emergency plan changes is Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.54(q). In accordance with this regulation, licensees are responsible for the evaluation of a proposed change and a determination as to whether the change results in a reduction in the effectiveness of the emergency plan. As a result of this determination, the licensee will either implement the change or submit it to the NRC for staff approval prior to implementation. The information provided by this EPFAQ does not relieve a licensee of the obligation to comply with the requirements of 10 CFR 50.54(q). In the interest of clarity, the staff notes that a licensee:

- May reference this EPFAQ as a change initiator but not as the justification making a change to their emergency plan;
- Must evaluate the impact of the revised EAL on their existing, approved emergency classification scheme;
- Must determine if the changed EAL would reduce the effectiveness of their emergency plan using the guidance provided in Regulatory Guide 1.219 (Reference #4); and
- Should reference 10 CFR Part 50 Appendix E, Section IV.B.2 as the regulatory basis for submitting an LAR to revise an entire EAL scheme.

References:

1. NEI letter and attachment, dated July 10, 2014, "Industry Review of Emergency Preparedness Frequently Asked Questions 2014-001, 2014-002, and 2014-003," (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML14195A395 and ML14195A410).
2. NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," November 2012 (ADAMS Accession No. ML12326A805).
3. NRC, Regulatory Issue Summary 2003-18, with Supplements 1 and 2, Use of NEI-99-01, 'Methodology for Development of Emergency Action Levels,' dated January 2003, dated October 8, 2003 (ADAMS Accession Nos. ML032580518, ML041550395, and ML051450482).
4. Regulatory Guide 1.219, "Guidance on Making Changes to Emergency Response Plans for Nuclear Power Plants," dated November 2011 (ADAMS Accession No. ML102510626).

PD-AU1
Abnormal Radiation Levels/Radiation Effluent

ECL: Unusual Event

PD-AU1

Initiating Condition: An uncontrolled release of gaseous or liquid radioactivity for 60 minutes or longer.

Emergency Action Levels: 1, 2, or 3

NOTE: The emergency director should declare the unusual event promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded.

NOTE: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.

NOTE: 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. PD-AU1.1 Reading on ANY (site-specific) effluent radiation monitor that is greater than the reading shown for 60 minutes or longer.
2. PD- AU1.2 Confirmed sample analysis for a gaseous release indicates a concentration greater than (site-specific) for 60 minutes or longer.
3. PD-AU1.3 Confirmed analysis for a liquid effluent sample indicates a concentration or release rate greater than two times the Offsite Dose Calculation Manual (ODCM) limits for 60 minutes or longer.

Basis:

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

With the station being permanently shut down for more than (site-specific) days, the only radionuclide of any significance available to be released in gaseous form is the noble gas Kr-85. Kr-85 decays emitting a beta particle and low abundance gamma, and is, therefore, not a significant contributor to total effective dose equivalent (TEDE). The gaseous release portion of this IC (detected either by an effluent monitor or by sample analysis) is not based on any particular ODCM values of dose or dose rate but rather the radiological release that results from damage to a fuel assembly and cannot be controlled. The liquid release portion of this IC is based on an uncontrolled release that exceeds two times the radiation monitor discharge permit limit or ODCM default setpoint value.

Licenses incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases. For gaseous and liquid releases, these controls are located in the ODCM. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of degradation in these features and/or controls.

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

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

PD-AU1.2 and PD-AU1.3 address uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys.

Releases should not be prorated or averaged. For example, a release exceeding four times release limits for 30 minutes does not meet the EAL. Recording equipment can be used to determine the start time of a release. Escalation of the emergency classification level would be via IC PD-AA1.

PD-AA1
Abnormal Radiation Levels/Radiation Effluent

ECL: Alert

Initiating Condition: An uncontrolled release of gaseous or liquid radioactivity resulting in detectable levels at the site boundary.

Emergency Action Levels: 1, 2, or 3

NOTE: The emergency director should declare the alert promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

NOTE: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.

NOTE: If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

1. Reading on ANY (site-specific) effluent radiation monitor that is greater than the reading shown for 15 minutes or longer:
2. Confirmed sample analysis for a gaseous release indicates a concentration greater than (site-specific) 15 minutes or longer.
3. Confirmed analysis of a liquid effluent sample indicates a concentration or release rate greater than 50 times the ODCM limits for 15 minutes or longer.

Basis:

This IC addresses a release of gaseous or liquid radioactivity that results in detectable levels offsite that are below 1 percent of the Environmental Protection Agency Protective Action Guides. It includes both monitored and unmonitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that could potentially exceed regulatory limits (e.g., a significant uncontrolled release).

With the station being permanently shut down for more than (site-specific) days, the only radionuclide of significance available to be released in gaseous form is the noble gas Kr-85. Kr-85 decays emitting a low abundance gamma, and is, therefore, not a significant contributor to TEDE. The gaseous release portion of this IC (detected by either an effluent monitor or by sample analysis) is not based on any particular ODCM values of dose or dose rate but rather the radiological release that results from damage to multiple fuel assemblies and cannot be controlled. The liquid release portion of this IC is based on an uncontrolled release that exceeds 50 times the radiation monitor discharge permit limit or ODCM default setpoint value.

Licensees incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases. For gaseous and liquid releases, these controls are located in the ODCM. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of degradation in these features and/or controls.

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

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. PD-AA1.2 and PD-AA1.3 addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys. Recording equipment can be used to determine the start time of a release.