

Mitigation of Beyond-Design-Basis Events Rulemaking (aka Consolidated Rulemaking)
Preliminary Proposed Rule Language
August 4, 2014

The following conceptual rule is only intended to facilitate discussion. The concepts are not being provided to solicit comments on the specific language but to result in a better integrated set of requirements that reflects and aligns with industry implementation. The objective is a more coherent and understandable regulatory framework. These concepts DO NOT constitute an official Nuclear Regulatory Commission (NRC) position and are for discussion only.

This rulemaking addresses, either in requirements or through supporting implementation guidance, regulatory actions that stem from all of the recommendations in Near-Term Task Force (NTTF) Recommendations 4, 7, 8, 9.1, 9.2, 9.3, with one exception (maintenance of Emergency Response Data System (ERDS) capability throughout the accident), 10.2, and 11.1. Also, the current intent is to include a regulatory action stemming from NTTF 9.4, ERDS (modernization only).

All requirements in this rulemaking are subject to backfitting requirements, and more importantly, different portions of the consolidated rulemaking would have different backfit bases. Requirements stemming from Order EA-12-049 (i.e., making the Order requirements generically-applicable) would typically not be new impositions, since Order EA-12-049 has already been imposed as adequate protection backfits. Any requirement extending beyond EA-12-049 would need to be justified under 10 CFR 50.109, "Backfitting."

Stakeholders should also recognize that these concepts represent a snapshot in time and that a proposed rule could differ from the concepts presented here. It could contain similar requirements or new requirements not identified here, or portions of the concepts may not be proposed as requirements.

50.xxx Mitigation of Beyond-Design-Basis Events

a. Applicability.

1. Each holder of an operating license for a nuclear power reactor unit under this part and each holder of a combined license under Part 52 of this chapter after the Commission has made the finding under § 52.103(g) shall comply with the requirements of this section.
2. Each holder of a combined license (COL) under part 52 of this chapter before the Commission has made the finding under § 52.103(g) shall comply with the requirements of this section, except as described in § 50.XXX(e). [Exclusion is necessary, because COL holders before the § 52.103(g) finding will need to show compliance with the drills and exercises section of § 50.XXX(e) before fuel load.]
3. When an entity described in paragraph (a)(1) has submitted to the NRC, the certifications described in section § 50.82(a) or § 52.110(a) of this chapter, then that entity can cease maintenance of the procedures, strategies, guidelines, capabilities, or descriptions required by this section associated with maintaining or restoring core cooling for the unit described in the § 50.82(a) or § 52.110(a) certifications.
4. When the entity described in paragraph (a)(3) has permanently removed all spent fuel from its spent fuel pool, then that entity can cease maintenance of the procedures, strategies, guidelines, capabilities, or descriptions required by this section associated with maintaining or restoring containment and spent fuel pool cooling capabilities for the unit described in the § 50.82(a) or § 52.110(a) certifications.
5. The requirements of this section do not apply to holders of general or specific licenses for Independent Spent Fuel Storage Installations under part 72 of this chapter.
6. [Part 50 and part 52 applicants will be required to submit information regarding how they will comply with the requirements in this § 50.XXX. These submittal requirements will be located in the relevant application requirements sections of § 50.34 and part 52, which will cross-reference the applicable provisions of this § 50.XXX].

b. Each licensee shall develop, implement, and maintain an integrated response capability that includes:

1. Mitigation Strategies for Beyond-Design-Basis External Events.

Strategies and guidelines to mitigate beyond-design-basis external events resulting from natural phenomena that can be implemented site-wide and whenever there is irradiated fuel in the reactor vessel or spent fuel pool, to include:

- i. Maintaining or restoring core cooling, containment, and spent fuel pool cooling capabilities; and

- ii. Enabling the use and receipt of offsite assistance and resources to support the continued maintenance of the functional capabilities for core cooling, containment, and spent fuel pool cooling, until sufficient site functional capabilities can be maintained without the need for the mitigation strategies.
 - 2. Extensive Damage Mitigation Guidelines (EDMGs).
Strategies and guidelines to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire, to include strategies in the following areas:
 - i. Fire fighting;
 - ii. Operations to mitigate fuel damage; and
 - iii. Actions to minimize radiological release.
 - 3. Severe Accident Management Guidelines (SAMGs).
Strategies and guidelines for mitigating the consequences of events that result in significant damage to fuel in the reactor vessel or spent fuel pool, to include:
 - i. Maintaining or restoring core cooling, containment, and spent fuel pool cooling capabilities; and
 - ii. Minimizing radiological release.
 - 4. Emergency Operating Procedures (EOPs)
Emergency Operating Procedures as required by the licensee's technical specifications.
 - 5. Command and Control
Roles, responsibilities, and authorities for directing and performing activities in accordance with the event and accident mitigation procedures, strategies, and guidelines listed in paragraphs (b)(1)-(b)(4) of this section for events affecting multiple units within the licensee's site boundary.
 - 6. Personnel
Sufficient personnel trained and qualified commensurate with their roles, responsibilities, and authorities to direct, or perform activities in accordance with the event and accident mitigation procedures, strategies, and guidelines listed in this section.
- c. Equipment Supporting the Mitigation Strategies for Beyond Design Basis External Events.
- 1. The equipment relied on for the mitigation strategies required by paragraph (b)(1) of this section must have sufficient capacity and capability such that core cooling, containment, and spent fuel pool cooling capabilities can be simultaneously maintained or restored for all the power reactor units within the licensee's site boundary.

2. The equipment relied on for the mitigation strategies required by paragraph (b)(1) of this section must be reasonably protected from the effects of severe natural phenomena that are as severe as the design basis external events in the licensing basis for the facility.
3. Design features must be provided that enable the connection of the portable equipment relied on by the mitigation strategies required by paragraph (b)(1) of this section.
4. Equipment relied on for the station blackout mitigation strategies in paragraph (b)(1) of this section must receive sufficient testing and maintenance such that the equipment is expected to fulfill its intended function following a beyond-design-basis external event.
5. Equipment relied on for the station blackout mitigation strategies in paragraph (b)(1) of this section must include reliable means to remotely monitor wide-range spent fuel pool levels to support effective prioritization of event mitigation and recovery actions.

d. Training requirements:

Each licensee shall provide for the training and qualification of personnel that perform any or all the activities in accordance with the procedures, strategies, and guidelines identified in paragraphs (b)(1) – (b)(5) of this section. Training not otherwise required by NRC regulations must be derived from a systems approach to training as defined in 10 CFR 55.4.

e. Drills and Exercises.

By [insert date 4 years after rule becomes effective], and in each succeeding 8-year period, each licensee shall conduct drills, exercises, or both, that collectively demonstrate a capability to implement the procedures, strategies, and guidelines in this section. Each licensee shall not exceed 8 years between any consecutive drills or exercises.

f. Change Control.

1. A licensee may make changes to the procedures, strategies, guidelines, capabilities, or descriptions required by this section if the licensee performs and retains an evaluation that the revised procedures, strategies, guidelines, capabilities, or descriptions continue to ensure that the provisions of this section are met. [Statement Of Consideration: The licensee would still be required to apply any other regulations that govern change control to judge the acceptability of proposed facility changes. Of particular note, changes to power reactor facilities (e.g., intended to implement mitigation strategies features) would need to be evaluated for any impacts to safety-related structures, systems, and

components under § 50.59 to ensure that no adverse impacts occurred with regard to those safety-related SSCs and associated functions.]

2. Documentation of all changes shall be maintained until the requirements of this section no longer apply.

g. [Implementation]

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**Potential Edits to 10 CFR Part 50, Appendix E,
Section IV:**

A. Organization

9. By December 24, 2012, for nuclear power reactor licensees, a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.

10. By XXXXXXXX, for nuclear power reactor licensees, a detailed analysis demonstrating that sufficient staff is available to implement the guidance and strategies to respond to a beyond design basis external event resulting in impeded access to the nuclear power plant, an extended loss of ac power sources and loss of access to ultimate heat sink, and affecting all units on-site.

B. Assessment Actions

1. The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials, including from all reactor core and spent fuel pool sources, shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant. The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and state and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.

E. Emergency Facilities and Equipment

Adequate provisions shall be made and described for emergency facilities and equipment, including:

1. Equipment at the site for personnel monitoring;
2. Equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials, including from all reactor core and spent fuel pool sources, to the environment;

9. At least one onsite and one offsite communications system capable of remaining functional during an extended loss of alternating current power including the effects of the loss of the local communications infrastructure [within 25 miles]; each system shall have a backup power source. All communication plans shall have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and

backup means of communication. Where consistent with the function of the governmental agency, these arrangements will include:

VI. Emergency Response Data System

3. Maintaining Emergency Response Data System:

a. Any hardware and software changes that affect the transmitted data points identified in the ERDS Data Point Library⁹ (site specific data base residing on the ERDS computer) must be submitted to the NRC within 30 days after the changes are completed.

b. Hardware and software changes, with the exception of data point modifications, that could affect the transmission format and computer communication protocol to the ERDS must be provided to the NRC as soon as practicable and at least 30 days prior to the modification.

~~c. In the event of a failure of the NRC supplied onsite modem, a replacement unit will be furnished by the NRC for licensee installation.~~