NUCLEAR REGULATORY COMMISSION

10 CFR Parts 50 and 52

[Docket Nos. PRM–50–96, PRM–50–97, PRM–50–98, PRM–50–100, PRM–50–101, and PRM–50–102; NRC–2011–0069, NRC–2011–0189, and NRC–2014–0240]

RIN 3150–AJ49

Mitigation of Beyond-Design-Basis Events

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is amending its regulations that establish regulatory requirements for nuclear power reactor applicants and licensees to mitigate beyond-design-basis events. The NRC is making generically applicable the requirements in NRC orders for mitigation of beyond-design-basis events and for reliable spent fuel pool instrumentation (SFPI). This rule also addresses a number of petitions for rulemaking (PRMs) submitted to the NRC following the March 2011 Fukushima Dai-ichi event. This rulemaking is applicable to power reactor licensees and power reactor license applicants.

DATES: This final rule is effective on September 9, 2019.

ADDRESSES: Please refer to Docket ID NRC–2014–0240 when contacting the NRC about the availability of information for this action. You may obtain publicly-available information related to this action by any of the following methods:

• *Federal Rulemaking Website:* Go to *http://www.regulations.gov* and search for Docket ID NRC–2014–0240. Address questions about NRC dockets to Carol Gallagher; telephone: 301–415–3463; email: *Carol.Gallagher@nrc.gov.* For technical questions, contact the individuals listed in the **FOR FURTHER INFORMATION CONTACT** section of this document.

• *NRC's Agencywide Documents Access and Management System (ADAMS):* You may obtain publicly-available documents online in the ADAMS Public Documents collection at *http://www.nrc.gov/reading-rm/adams.html.* To begin the search, select ''ADAMS Public Documents'' and then select ''Begin Web-based ADAMS Search.'' For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1–800–397–4209, 301–415–4737, or by email to *pdr.resource@nrc.gov.* For the convenience of the reader, instructions about obtaining materials referenced in this document are provided in the ''Availability of Documents'' section.

• *NRC's PDR:* You may examine and purchase copies of public documents at the NRC's PDR, Room O1–F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: Timothy Reed, Office of Nuclear Reactor Regulation, telephone: 301–415–1462, email: *Timothy.Reed@nrc.gov*; or Eric Bowman, Office of Nuclear Reactor Regulation, telephone: 301–415–2963, email: *Eric.Bowman@nrc.gov.* Both are staff of the U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001.

SUPPLEMENTARY INFORMATION

Executive Summary

A. Need for the Regulatory Action

The NRC is amending its regulations to establish regulatory requirements for nuclear power reactor applicants and licensees to mitigate beyond-design-basis events. This rule makes NRC Order EA–12–049, ''Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events'' (Mitigation Strategies Order), and Order EA–12–051, ''Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'' (SFPI Order), generically applicable; establishes regulatory requirements for documentation of changes; and addresses a number of PRMs submitted to the NRC following the March 2011 Fukushima Dai-ichi event. This rule is applicable to power reactor licensees and power reactor license applicants. The NRC conducted this rulemaking to amend the regulations to reflect requirements imposed on current licensees by order and to reflect the lessons learned from the Fukushima Dai-ichi event.

B. Major Provisions

Major provisions of this rule include the following amendments or additions to parts 50 and 52 of title 10 of the *Code of Federal Regulations* (10 CFR):

• Revise the 10 CFR part 50 ''Contents of applications; technical information'' and 10 CFR part 52 ''Contents of applications; additional technical information'' requirements to reflect the additional information that would be required for applications.

• Add § 50.155, which contains beyond-design-basis mitigation requirements that make the Mitigation Strategies and SFPI Orders generically applicable.

C. Costs and Benefits

The NRC prepared a regulatory analysis to determine the expected costs and benefits of this Mitigation of Beyond-Design-Basis Events (MBDBE) final rule (MBDBE rule). The analysis examines the costs and benefits of the rule requirements relative to the baseline case (*i.e.,* no action alternative, which equates to implementation of the Mitigation Strategies and SFPI Orders without this final rule being issued). The final rule encompasses provisions that are either completed or being implemented at this time under the Mitigation Strategies Order and the SFPI Order. Because the NRC uses a no action baseline to estimate incremental costs, the total cost of the rule is estimated to be approximately $110,000 per site. The net present value of these costs per site is approximately $110,000 using a 7 percent discount rate. This incremental cost is primarily attributed to licensees' efforts to review the rule against the previous implementation of the Mitigation Strategies and SFPI Orders and make any additional changes to plant programs and procedures. The final rule is expected to result in a total one-time cost of approximately $7.2 million. The net present value of these costs is approximately $7.2 million using a 7 percent discount rate even though the MBDBE requirements have largely been implemented prior to the effective date of the rule under the requirements in the Mitigation Strategies Order and the SFPI Order.

Based on the NRC's assessment of the costs and benefits of the rule, the NRC has concluded that the MBDBE rule is justified. For more information, please see the regulatory analysis.

As required by § 50.109, ''Backfitting,'' (the Backfit Rule) and § 52.98, ''Finality of combined licenses; information requests,'' a backfitting and issue finality assessment was prepared. This document presents the reasons why the MBDBE rule provisions, with one exception, do not constitute backfits and are consistent with issue finality. The one instance of inconsistency with the issue finality provisions of § 52.98 is due to a correction to a drafting error in the former § 50.54(hh)(3), renumbered in this rulemaking as § 50.54(hh)(2), which was intended to remove the requirements of § 50.54(hh) upon the submittal of the certifications of permanent cessation of operation and permanent removal of fuel from the reactor vessel. This rulemaking corrects the citation of the requirements for these certifications from § 52.110(a)(1) to § 52.110(a) in order to include both the certification of permanent cessation of

operations and the certification of permanent removal of fuel from the reactor vessel. Further details are provided in Section X, ''Backing and Issue Finality,'' of this document.

Table of Contents

I. Background

A. Fukushima Dai-ichi

On March 11, 2011, the Great East Japan Earthquake, rated a magnitude 9.0, occurred off the coast of Honshu Island, resulting in the automatic shutdown of 11 nuclear power plants (NPPs) at four sites along the northeast coast of Japan, including three of six reactors at the Fukushima Dai-ichi NPP (the three remaining plants were shutdown for maintenance). The earthquake caused a large tsunami that is estimated to have exceeded 14 meters in height at the Fukushima Dai-ichi NPP. The earthquake and tsunami produced widespread devastation across northeastern Japan, significantly impacting the infrastructure and industry in the northeastern coastal areas of Japan. The earthquake and tsunami disabled the majority of the external and internal electrical power systems at the Fukushima Dai-ichi NPP, creating a significant challenge for operators in responding to the event. In addition, the combination of severe events challenged the implementation of emergency plans and procedures.

B. Near-Term Task Force

The NRC Chairman's tasking memorandum, COMGBJ–11–0002, ''NRC Actions Following the Events in Japan,'' established a senior-level task force, referred to as the ''Near-Term Task Force'' (NTTF), to review the NRC's regulations and processes to determine if the agency should make improvements to the NRC's regulatory system in light of the events in Japan. On July 12, 2011, the NRC staff provided the report of the NTTF (NTTF Report) to the Commission as an enclosure to SECY–11–0093, ''Near-Term Report and Recommendations for Agency Actions Following the Events in Japan.'' The NTTF concluded that continued U.S. plant operation and NRC licensing activities present no imminent risk to public health and safety. While the NTTF also concluded that the current regulatory system has served the NRC and the public well, it found that enhancements to safety and emergency preparedness are warranted and made 12 general recommendations for Commission consideration. In examining the Fukushima Dai-ichi event for insights for reactors in the United States, the NTTF addressed protecting against accidents resulting from natural phenomena, mitigating the consequences of such accidents, and ensuring emergency preparedness. The NTTF found that the Commission's longstanding defense-in-depth philosophy, supported and modified as necessary by state-of-the-art probabilistic risk assessment techniques, should continue to serve as the primary organizing principle of its regulatory framework. The NTTF concluded that the application of the defense-in-depth philosophy could be strengthened by including explicit requirements for beyond-design-basis events.

C. Implementation of the Near-Term Task Force Recommendations

In response to the NTTF Report, the Commission directed the NRC staff on August 19, 2011, in Staff Requirements Memorandum (SRM)—SECY–11–0093, to engage with stakeholders to review and assess the NTTF recommendations in a comprehensive and holistic manner and to provide the Commission with fully-informed options and recommendations. The NRC staff provided the Commission with recommendations for near-term action in SECY–11–0124, ''Recommended Actions To Be Taken without Delay from the Near-Term Task Force Report,'' dated September 9, 2011. The suggested near-term actions addressed several NTTF recommendations associated with this rulemaking, including NTTF recommendations 4, 8, and 9.3. In SRM–SECY–11–0124, dated October 18, 2011, the Commission directed the NRC staff to, among other things: Initiate a rulemaking to address NTTF recommendation 4, station blackout (SBO) regulatory actions, as an advance notice of proposed rulemaking (ANPR); designate the SBO rulemaking associated with NTTF recommendation 4 as a high priority rulemaking; craft recommendations that continue to realize the strengths of a performance-based system as a guiding principle; and consider approaches that are flexible and able to accommodate a diverse range of circumstances and conditions. As discussed more fully in later portions of this document, the regulatory actions associated with NTTF recommendation 4 evolved substantially from this early Commission direction and included issuance of Order EA–12–049, ''Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events'' (Mitigation Strategies Order), that, as implemented, ultimately addressed all of NTTF recommendation 4 as well as other recommendations.

In SECY–11–0137, ''Prioritization of Recommended Actions To Be Taken in Response to Fukushima Lessons Learned,'' dated October 3, 2011, the NRC staff, based on its assessment of the NTTF recommendations, proposed to the Commission a three-tiered prioritization for implementing regulatory actions stemming from the NTTF recommendations. The Tier 1 recommendations were those actions having the greatest safety benefit that could be implemented without unnecessary delay. The Tier 2 recommendations were those actions that needed further technical assessment or critical skill sets to implement, and the Tier 3 recommendations were longer-term actions that depended on the completion of a shorter-term action or needed additional study to support a regulatory action. On December 15, 2011, the Commission approved the staff's recommended prioritization in SRM–SECY–11–0137.

The NTTF recommendations that provide the initial regulatory impetus for this rulemaking include the following:

- NTTF recommendation 4: Strengthen SBO mitigation capability at all operating and new reactors for design-basis and beyond-design-basis external events;
- NTTF recommendation 7: Enhance spent fuel pool (SFP) makeup capability and instrumentation for the SFP;
- NTTF recommendation 8: Strengthen and integrate onsite emergency response capabilities such as emergency operating procedures (EOPs), severe accident management guidelines

(SAMGs), and extensive damage mitigation guidelines (EDMGs);

- NTTF recommendation 9: Require that facility emergency plans address staffing, dose assessment capability, communications, training and exercises, and equipment and facilities for prolonged SBO, multi-unit events, or both;
- NTTF recommendation 10: Pursue additional emergency protection topics related to multi-unit events and prolonged SBO, including command and control structure and the qualifications of decision makers; and
- NTTF recommendation 11: Pursue emergency management topics related to decision making, radiation monitoring, and public education, including the ability to deliver equipment to the site with degraded offsite infrastructure.

In response to input received from stakeholders, the NRC accelerated the schedule originally proposed in SECY–11–0137. On February 17, 2012, the NRC staff recommended in SECY–12–0025, ''Proposed Orders and Requests for Information in Response to Lessons Learned From Japan's March 11, 2011, Great Tōhoku Earthquake and Tsunami,'' that the Commission issue orders for items that warranted generic safety improvements and requests for information where further consideration of the need for safety improvements would be necessary on a site-specific basis.

To address Tier 1 NTTF recommendation 4, on March 12, 2012, the NRC issued the Mitigation Strategies Order, requiring all U.S. nuclear power plant licensees to have additional capability to mitigate beyond-design-basis external events through the implementation of strategies and guidelines that enable them to cope without their permanently installed alternating current (ac) electrical power sources for an indefinite period of time. These strategies would provide additional capability to maintain or restore reactor core and spent fuel cooling, as well as protect the reactor containment. This order also addressed: Portions of NTTF recommendation 9 to require that facility emergency plans address prolonged SBOs and multi-unit events; portions of NTTF recommendation 10 to pursue additional emergency protection topics related to multi-unit events and prolonged SBO; and portions of NTTF recommendation 11 to pursue emergency procedure topics related to decision making, radiation monitoring, and public education.

To address Tier 1 NTTF recommendation 7, on March 12, 2012, the NRC issued Order EA–12–051, ''Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'' (SFPI Order), requiring all U.S. nuclear power plant licensees to have a reliable indication of the water level in associated SFPs.

To address Tier 1 NTTF recommendation 8, the NRC issued an ANPR (77 FR 23161) on April 18, 2012, to engage stakeholders in rulemaking activities associated with the methodology for the integration of onsite emergency response processes, procedures, training and exercises.

The requests for information were issued under § 50.54(f) on March 12, 2012, to address elements of NTTF recommendation 2, concerning external hazard walkdowns and reevaluations, and NTTF recommendation 9, concerning staffing and communications.

D. Consolidation of Regulatory Efforts

While developing the rulemakings discussed in the previous section, the NRC staff recognized that efficiencies could be gained by consolidating the rulemaking efforts due to the inter-relationships among the proposed changes. The NRC staff recommended to the Commission that rulemaking activities to address NTTF recommendations 4, 7, 8, 10.2, and 11.1, as well as portions of NTTF recommendation 9, be consolidated. (See COMSECY–13–0002, ''Consolidation of Japan Lessons Learned Near-Term Task Force Recommendations 4 and 7 Regulatory Activities,'' dated January 25, 2013; COMSECY–13–0010, ''Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned,'' dated March 27, 2013; and SECY–14–0046, ''Fifth 6-Month Status Update on Response to Lessons Learned From Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami,'' dated April 17, 2014.) Section I.C, ''Implementation of the Near-Term Task Force Recommendations,'' of this document contains a more complete discussion of the scope of NTTF recommendations addressed by the MBDBE rule. The Commission approved these consolidations in the associated SRMs. Consequently, the MBDBE rule combines two NRC activities for which documents have been published in the **Federal Register**—Onsite Emergency Response Capabilities (RIN 3150–AJ11; NRC–2012–0031) and Station Blackout Mitigation Strategies (RIN 3150–AJ08; NRC–2011–0299). The MBDBE rule identification number and regulations.gov docket number are RIN 3150–AJ49 and NRC–2014–0240, respectively. These consolidations were intended to meet the following objectives:

1. Align the regulatory framework with ongoing industry implementation efforts to produce a more coherent and understandable regulatory framework. Given the complexity of these requirements and their associated implementation, the NRC concluded that this was an important objective for the regulatory framework.

2. Reduce the potential for inconsistencies and complexities between the related rulemaking actions that could occur if the efforts remained as separate rulemakings.

3. Facilitate better understanding of the requirements for both internal and external stakeholders, and thereby lessen the impact on internal and external stakeholders who would otherwise need to review and comment on multiple rulemakings while cross-referencing both proposed rules and sets of guidance documents.

II. Opportunities for Public Involvement

As discussed in Section I.D, ''Consolidation of Regulatory Efforts,'' of this document, the MBDBE rule is a consolidation of several regulatory activities, including two previous rulemaking efforts: The Station Blackout Mitigation Strategies rulemaking and the Onsite Emergency Response Capabilities rulemaking. Both of these rulemaking efforts offered extensive external stakeholder involvement opportunities, including public meetings, ANPRs issued for public comment, and draft regulatory basis documents issued for public comment. The major opportunities for stakeholder involvement were as follows:

1. Station Blackout ANPR (77 FR 16175; March 20, 2012);

2. Onsite Emergency Response Capabilities ANPR (77 FR 23161; April 18, 2012);

3. Station Blackout Mitigation Strategies draft regulatory basis and draft rule concepts (78 FR 21275; April 10, 2013); and

4. Onsite Emergency Response Capabilities draft regulatory basis (78 FR 1154; January 8, 2013).

The final Station Blackout Mitigation Strategies regulatory basis was issued on July 23, 2013 (78 FR 44035), and the final Onsite Emergency Response Capabilities regulatory basis, with preliminary proposed rule language, was issued on October 25, 2013 (78 FR 63901). The NRC described in each final regulatory basis document how it considered stakeholder feedback in

developing the respective final regulatory basis, including consideration of ANPR comments and draft regulatory basis document comments. Section 5 of the Station Blackout Mitigation Strategies regulatory basis document includes a discussion of stakeholder feedback used to develop the final regulatory basis. Appendix B to the Onsite Emergency Response Capabilities regulatory basis includes a discussion of stakeholder feedback used to develop that final regulatory basis.

The public has had multiple opportunities to engage in these regulatory efforts. Most noteworthy were the following:

1. Preliminary proposed rule language for Onsite Emergency Response Capabilities made available to the public on November 15, 2013 (78 FR 68774).

2. Consolidated rulemaking proof of concept language made available to the public on February 21, 2014.

3. Preliminary proposed rule language for MBDBE rulemaking made available to the public on August 15, 2014.

4. Preliminary proposed rule language for MBDBE rulemaking made available to the public on November 13, 2014, and December 8, 2014, to support public discussion with the Advisory Committee on Reactor Safeguards (ACRS).

The NRC issued the MBDBE proposed rule on November 13, 2015 (80 FR 70609), for a 90-day public comment period. The comment period closed on February 11, 2016. During the public comment period, on January 21, 2016, the NRC held a public meeting to provide external stakeholders with a better understanding of the proposed requirements and thereby facilitate more informed feedback. Twenty sets of comments were received in response to the proposed rule. The NRC's consideration of these comments is addressed in Section IV, ''Public Comments and Changes to the Rule,'' of this document. The NRC staff has had numerous interactions with the ACRS, and in all cases these were public meetings, including the following:

1. The ACRS Plant Operations and Fire Protection subcommittee met on February 6, 2013, to discuss the Onsite Emergency Response Capabilities regulatory basis.

2. The ACRS Regulatory Policies and Practices subcommittee met on December 5, 2013, and April 23, 2013, to discuss the Station Blackout Mitigation Strategies regulatory basis.

3. The ACRS full committee met on June 5, 2013, to discuss the Station Blackout Mitigation Strategies regulatory basis.

4. The ACRS Fukushima subcommittee met on June 23, 2014, to discuss consolidation of Station Blackout Mitigation Strategies and Onsite Emergency Response Capabilities rulemakings.

5. The ACRS full committee met on July 10, 2014, to discuss consolidation of Station Blackout Mitigation Strategies and Onsite Emergency Response Capabilities rulemakings.

6. The ACRS Fukushima subcommittee met on November 21, 2014, to discuss preliminary proposed MBDBE rulemaking language.

7. The ACRS full committee met on December 4, 2014, to discuss preliminary proposed MBDBE rulemaking language.

8. The ACRS Fukushima subcommittee met on March 19, 2015, to discuss the proposed MBDBE rulemaking package.

9. The ACRS full committee met on April 9, 2015, to discuss the proposed MBDBE rulemaking package.

10. The ACRS full committee met on June 10, 2015, to receive a status update on the efforts to develop supporting guidance to implement the MBDBE rule.

11. The ACRS Fukushima subcommittee met on April 22, 2016, to receive an update on the public comments provided on the proposed MBDBE rule.

12. The ACRS Fukushima subcommittee met on August 17, 2016, to discuss the path forward on the substantive public comments provided on the MBDBE rule.

13. The ACRS Fukushima subcommittee met on October 19, 2016, to discuss the final MBDBE rule guidance.

14. The ACRS Fukushima subcommittee met on November 16, 2016, to discuss the final MBDBE rule package.

15. The ACRS full committee met on November 30, 2016, to discuss the final MBDBE rule package.

The NRC held a public meeting on November 10, 2016, to discuss implementation issues associated with the MBDBE final rule as required by its cumulative effects of regulation (CER) process.

III. Petitions for Rulemaking

During development of this rule, the NRC gave consideration to the issues raised in six PRMs submitted to the NRC, five from the Natural Resources Defense Council, Inc. (NRDC) (PRM–50–97, PRM–50–98, PRM–50–100, PRM–50–101, and PRM–50–102) and one submitted by Mr. Thomas Popik (PRM–50–96). The NRDC petitions were dated July 26, 2011, and docketed by the NRC on July 28, 2011. The NRC published a notice of receipt in the **Federal Register** on September 20, 2011 (76 FR 58165), for the NRDC petitions, and did not ask for public comment at that time. The petitions filed by the NRDC use the NTTF Report as the sole basis for the PRMs. The NTTF recommendations that the NRDC PRMs rely upon are: 4.1, 7.5, 8.4, 9.1, and 9.2. This rule addresses each of these recommendations, and therefore it resolves the issues raised by the NRDC PRMs. Accordingly, the NRC's issuance of the MBDBE rule completes all planned regulatory activities for the NRDC petitions. The PRM–50–96, filed by Mr. Popik, is still under consideration by the NRC and is not fully addressed at this time, as discussed in greater detail below.

In PRM–50–97 (NRC–2011–0189), the NRDC requested emergency preparedness enhancements for prolonged SBOs in the areas of communications ability, Emergency Response Data System (ERDS) capability, training and exercises, and equipment and facilities (NTTF recommendation 9.2). The NRC considered the issues raised in this PRM as part of the MBDBE rulemaking. The NRC's consideration of the issues raised in PRM–50–97 are reflected in the provisions in § 50.155(d) concerning training. The NRC concludes that consideration of the PRM issues and the underlying NTTF Report recommendations, as discussed in this document, addresses PRM–50–97. This completes the NRC's consideration of PRM–50–97.

In PRM–50–98 (NRC–2011–0189), the NRDC requested emergency preparedness enhancements for multi-unit events in the areas of personnel staffing, dose assessment capability, training and exercises, and equipment and facilities (NTTF recommendation 9.1). The NRC considered the issues raised in this PRM as part of the MBDBE rulemaking. The NRC's consideration of the issues raised in PRM–50–98 are reflected in the provisions in § 50.155(b)(1) concerning development, implementation and maintenance of strategies and guidelines, which subsumes staffing, and § 50.155(d) concerning training, which subsumes drills or exercises. The NRC concludes that consideration of the PRM issues and the underlying NTTF Report recommendations, as discussed in this document, addresses PRM–50–98. This completes the NRC's consideration of PRM–50–98.

In PRM–50–100, the NRDC requested enhancement of SFP makeup capability

and instrumentation for the SFP (NTTF recommendation 7.5). The NRC determined that the issues raised in this PRM should be considered in the NRC's rulemaking process, and the NRC published a document in the **Federal Register** with this determination on July 23, 2013 (78 FR 44034). The NRC's consideration of the issues raised in PRM–50–100 within the MBDBE rulemaking are reflected in the provisions in § 50.155(b)(1) concerning mitigation strategies for maintaining or restoring SFP cooling capabilities and § 50.155(e) concerning SFP monitoring. The NRC concludes that consideration of the PRM issues and the underlying NTTF Report recommendations, as discussed in this document, addresses PRM–50–100. This completes the NRC's consideration of PRM–50–100.

In PRM–50–101, the NRDC requested that § 50.63, ''Loss of all alternating current power,'' be revised to establish a minimum coping time of 8 hours for a loss of all ac power; establish the equipment, procedures, and training necessary to cope with an extended loss of ac power (72 hours) for core and SFP cooling and for reactor coolant system and primary containment integrity as needed; and establish requirements to preplan/prestage offsite resources to support uninterrupted core and SFP cooling and reactor coolant system and containment integrity as needed (NTTF recommendation 4.1). The NRC determined that the issues raised in this PRM should be considered in the NRC's rulemaking process, and the NRC published a document in the **Federal Register** with this determination on March 21, 2012 (77 FR 16483). The NRC's consideration of the issues raised in PRM–50–101 within the MBDBE rulemaking is reflected in the provisions in § 50.155(b)(1) concerning mitigation strategies for maintaining or restoring core cooling, containment, and SFP cooling capabilities; § 50.155(c) concerning equipment; § 50.155(d) concerning training; and § 50.155(f) concerning documentation of changes. The NRC concludes that consideration of the PRM issues and the underlying NTTF Report recommendations, as discussed in this document, addresses PRM–50–101. This completes the NRC's consideration of PRM–50–101.

In PRM–50–102, the NRDC requested more realistic, hands-on training and exercises on SAMGs and EDMGs for licensee staff expected to implement those guideline sets and make decisions during emergencies (NTTF recommendation 8.4). The NRC determined that the issues raised in this PRM should be considered in the NRC's rulemaking process, and the NRC published a document in the **Federal Register** with this determination on April 27, 2012 (77 FR 25104). The NRC's consideration of the issues raised in PRM–50–102 within the MBDBE rulemaking are reflected in the provisions in § 50.155(d) concerning training. The NRC concludes that consideration of the PRM issues and the underlying NTTF Report recommendations, as discussed in this document, addresses PRM–50–102. This completes the NRC's consideration of PRM–50–102.

In PRM–50–96, Mr. Thomas Popik requested that the NRC amend its regulations to require facilities licensed by the NRC to assure long-term cooling and unattended water makeup of SFPs in the event of geomagnetic disturbances caused by solar storms resulting in long-term loss of power. The NRC determined that the issues raised in this PRM should be considered in the NRC's rulemaking process, and the NRC published a document in the **Federal Register** with this determination on December 18, 2012 (77 FR 74788). In that **Federal Register** document, the NRC also closed the docket for PRM–50–96. Specifically, the NRC indicated that it would monitor the progress of the MBDBE rule to determine whether the requirements established therein would address, in whole or in part, the issues raised in the PRM. In this context, the requirements in § 50.155(b)(1) and (c) and the associated regulatory guidance, address, in part, the issues raised by the petitioner because these regulations require licensees to establish offsite assistance to support maintenance of the key functions (including both reactor and SFP cooling) following an extended loss of ac power, which has been postulated as a consequence of geomagnetic disturbances.

The other issues raised in PRM–50–96 related to geomagnetic disturbances remain under NRC consideration. The issue of geomagnetic disturbances, as it impacts transmission system protection, is being addressed at a national level by the White House's Office of Science and Technology Policy (OSTP). The OSTP has been meeting with representatives from several different Federal agencies, including the NRC, over the last several years to develop the National Space Weather Strategy (NSWS) and the National Space Weather Action Plan (NSWAP). On October 13, 2016, President Obama issued Executive Order 13744, ''Coordinating Efforts To Prepare the Nation for Space Weather Events'' (81 FR 71573; October 18, 2016), requiring agencies to begin to implement the NSWAP. The Department of Homeland Security (DHS) is the sector-specific agency with lead responsibility for nuclear reactors, materials, and waste; therefore, the NRC is working with DHS on delineating the NRC authorities associated with the NSWAP.

Following completion of the MBDBE rulemaking, the NRC will address PRM–50–96 giving consideration to the NSWAP, the MBDBE rule, requirements established by the Federal Energy Regulatory Commission to address geomagnetic disturbances (81 FR 67120; September 30, 2016), and the additional comments that were submitted on this rulemaking that further inform the consideration of geomagnetic disturbances.

IV. Public Comments and Changes to the Rule

A. Overview of Public Comments and Removal of Requirements That Would Constitute Backfitting

During the public comment period for the MBDBE proposed rule and draft guidance, the NRC received 20 comment submissions containing 185 individual comments. In developing the final rule and supporting guidance, the NRC considered all the comments provided in response to the MBDBE proposed rule and draft guidance. The detailed consideration of the public comments is contained in a separate document that is referenced in Section XIX, ''Availability of Documents,'' of this document. While the NRC received many comments that enabled it to significantly improve the MBDBE rule and its supporting statement of considerations, this section focuses on the subset of those comments that directly resulted in changes to the MBDBE rule requirements or changes to the MBDBE rule supporting statement of considerations. This section also discusses noteworthy feedback received in response to specific questions in the **Federal Register** notice for the proposed rule and through the CER questions.

In addition, the NRC reexamined the potential requirements that had been included in the proposed MBDBE rule, particularly those that had been previously addressed at the regulatory guidance level regarding the Mitigation Strategies and SFPI Orders, in light of the requirements of §§ 50.109 and 52.98. Under § 50.109(a)(3), when the exceptions of § 50.109(a)(4) (in this case the exception to ensure adequate protection) do not apply, the NRC may require backfitting of a facility when it determines, based upon an analysis as described in § 50.109(c), that there is a substantial increase in the overall protection of the public health and

safety or the common defense and security to be derived from the backfit and that the direct and indirect costs of implementation for that facility are justified in view of the increased protection.

For items that were addressed at the regulatory guidance level, the NRC considered first whether inclusion of a requirement on the subject in the final rule would be necessary to ensure that there is adequate protection of public health and safety. In each case, the NRC concluded that the requirements imposed by the Orders were sufficient to provide reasonable assurance of adequate protection of public health and safety and no new information was developed with regard to the ''guidance'' items that would modify this conclusion. The NRC then considered whether there would be a substantial increase in the overall protection of the public health and safety or the common defense and security that would result from including requirements in the final rule for those items rather than continuing the practice of addressing them in the regulatory guidance as had been done for the orders. As discussed in the remainder of this section, the NRC concluded in general that, while there would be some benefit in the form of clarity as to what had been found acceptable for compliance with the orders being made generically applicable in this rulemaking, the recharacterization of those items from regulatory guidance to requirements would not constitute a substantial increase in the overall protection of the public health and safety or the common defense and security.

The NRC also took into consideration whether the items that had been addressed in the regulatory guidance were supporting elements to the overarching requirements for a capability to provide protection of public health and safety or whether the items directly affect public health and safety. For example, staffing and communications would be considered supporting elements for the overarching requirement to develop, implement, and maintain the mitigation strategies for beyond-design-basis external events, which contributes to the protection of public health and safety. Because of this, the NRC concludes that a separate requirement for the staffing and communications elements would not be needed, but could constrain an existing licensee or an applicant for a new licensee from developing innovative mitigation strategies that do not rely on staffing or communications. This follows the Commission's direction in SRM–SECY–11–0124 that

> [i]n order to be effective, approaches should be flexible and able to accommodate a diverse range of circumstances and conditions. In consideration of events beyond the design basis, a regulatory approach founded on performance-based requirements will foster development of the most effective and efficient, site-specific mitigation strategies, similar to how the agency approached the approval of licensee response strategies for the ''loss of large area'' event under its B.5.b program.

A discussion of the specific consideration of these items is provided in the remainder of this section.

B. Removal of Requirements To Address Seismic and Flooding Reevaluated Hazards

The NRC received comments stating that the need for a licensee's strategies and guidelines to be capable of execution in the context of the reevaluated flooding and seismic hazards should be addressed in § 50.155(b) rather than § 50.155(c)(2). The commenters noted that addressing the effects of reevaluated hazards on the mitigation strategies in § 50.155(b) rather than § 50.155(c)(2) provides greater flexibility regarding how a licensee can address the hazard effects through changes to mitigation strategies and guidelines, including changes to equipment protection. Additionally, commenters indicated that the regulation should allow for alternative approaches that would not necessarily address the damage state assumed for § 50.155(b)(1) nor necessarily assume the same success criteria and that should also allow for the use of risk-informed approaches.

The NRC agrees in part with these comments and concludes that including a requirement to address the effects of reevaluated hazards on the mitigation strategies in the rule would not be consistent with §§ 50.109 and 52.98 and could unduly limit the flexibility the commenters suggested should be in the rule.

The mitigation strategies under § 50.155(b)(1) originated in the Mitigation Strategies Order and were justified as necessary to provide adequate protection of public health and safety in light of the uncertainties associated with beyond-design-basis external events and the possibility that extreme natural phenomena could challenge the prevention, mitigation, and emergency preparedness defense-in-depth layers. In COMSECY–14–0037, ''Integration of Mitigating Strategies for Beyond-Design-Basis External Events and The Reevaluation of Flooding Hazards,'' dated November 21, 2014, the NRC staff recognized the interaction between the development and implementation of mitigation strategies for beyond-design-basis external events under the Mitigation Strategies Order and the reevaluation of flooding hazard levels using present-day regulatory guidance and methodologies from flooding evaluations used for early site permits and combined license reviews under NTTF Recommendation 2.1. In its SRM dated March 30, 2015, ''Staff Requirements—Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards,'' the Commission addressed this interaction by, in part, directing the staff to evaluate potential changes to the guidance for the integrated assessment of the effects of the flooding hazards on operating reactors and to introduce more realism for the purpose of identifying potential safety enhancements for operating reactors.

The changes to the regulatory decision-making process directed in the SRM to COMSECY–14–0037 reflected the recognition that the present-day regulatory guidance and methodologies are intended to identify a necessary level of protection from flooding that would meet the principal design criterion (PDC) of an application for an operating license or combined license corresponding to Criterion 2, ''Design bases for protection against natural phenomena,'' of appendix A to 10 CFR part 50, ''General Design Criteria for Nuclear Power Plants.'' That criterion requires applicants to design [s]tructures, systems and components (SSCs) important to safety to withstand the effects of natural phenomena such as earthquakes and floods without loss of capability to perform their safety functions. The criterion also requires that the design bases for these SSCs reflect, among other factors, appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated. Historically, the margin specified in this criterion has been achieved through the incorporation of conservatisms in the analyses used to determine the flooding design bases for power reactors rather than by the use of a minimum margin above the results of the analyses. The existence of these conservatisms was addressed by the Commission in its direction in the SRM to reduce any unnecessary conservatisms and identify

any areas with insufficient conservatisms. In keeping with that determination, the NRC concludes that adequate protection of public health and safety does not require the operating power reactor licensees to provide protection beyond those levels determined under Criterion 2 of appendix A to 10 CFR part 50 and that any backfitting in this area should be accomplished on an individualized basis under the Backfit Rule. The consideration of whether individual operating licenses for power reactor licensees should be modified, suspended, or revoked is being accomplished under the NRC efforts associated with the request for information issued under § 50.54(f) on March 12, 2012.

Therefore, the NRC disagrees with the recommendation of these comments that the reevaluated hazards levels be included in § 50.155(b) because that treatment would be inconsistent with the Backfit Rule and the issue finality provisions of 10 CFR part 52, but agrees that the reevaluated hazards should not be included in § 50.155(c).

The final rule is revised to remove reference to the reevaluated hazards, allowing licensees to address them within their mitigating strategies in a flexible and appropriate manner. Consideration of the treatment of reevaluated hazards resulting from the March 12, 2012, request for information issued under § 50.54(f) is nearing completion under a separate NRC process.

C. Protection of Equipment

The NRC received comments that indicated a lack of clarity associated with the proposed requirements for ''reasonable protection'' of the equipment in § 50.155(b)(1) from the effects of natural phenomena. The commenters indicated that there appeared to be conflict regarding the application of the reasonable protection requirement to portable ''FLEX equipment'' as defined in NEI 12–06, ''Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,'' versus application to installed SSCs relied on for the response to beyond-design-basis external events. These are typically safety-related SSCs relied on in the initial response to a beyond-design-basis external event as well as design-basis events, that as a result of their credited use for such events, have both beyond-design-basis and safety-related functions. Comments suggested that the proposed approach for ''reasonable protection'' was too limiting because it appeared to restrict licensees to applying ''reasonable protection'' only to equipment itself and not allow licensees the flexibility to implement broader changes in protection and/or changes to strategies.

The NRC agrees that the proposed requirements for reasonable protection need to be clarified and revised to provide greater flexibility. First, the reasonable protection requirements in the MBDBE rule are clarified in part due to removal of the reevaluated hazards from § 50.155. Removal of the reevaluated hazards requirement enabled the NRC to directly align the reasonable protection standard, in terms of the magnitude of natural phenomena that must be considered with the current external event design basis. Additionally, § 50.155(c)(2) was revised to characterize more specifically the effects of natural phenomena from which the equipment must be reasonably protected as ''equivalent in magnitude to the phenomena assumed for developing the design basis of the facility'' rather than ''equivalent to the design basis of the facility,'' as was described in the proposed rule.

Section VI of this document is revised to clarify how the concept of ''reasonable protection'' establishes a degree of assurance that is appropriate for the beyond-design-basis regulatory framework established through the MBDBE rule. This concept contrasts with the application of special treatment requirements, such as environmental qualification and quality assurance requirements, which are applied to safety-related SSCs for their design-basis-related functions to achieve a high level of regulatory assurance appropriate for design-basis requirements.

The NRC also clarifies the confusion that appears to stem from the application of the ''reasonable protection'' standard to safety-related SSCs that have both design-basis and beyond-design-basis functions. Safety-related SSCs that function initially in response to beyond-design-basis external events have two sets of functions: safety-related functions and beyond-design-basis functions. The NRC imposes extensive, special treatment requirements on these SSCs for their safety-related functions for design-basis events. This framework produces an increased level of assurance that the SSCs will perform those safety-related functions during and/or following the design-basis events as applicable. (See ''Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors; Final Rule'' (69 FR 68008; November 22, 2004).)

Through this final rule, the NRC places fewer regulatory requirements associated with the beyond-design-basis functions that dual-function SSCs perform to maintain or restore core cooling, containment, and SFP cooling capabilities, as compared to their safety-related, design-basis functions. The ''reasonable protection'' standard is a means for enabling greater flexibility for addressing external hazards, and in the process, enabling a beyond-design-basis regulatory framework that establishes an appropriate level of assurance. The fundamental applicability of the reasonable protection requirement is to equipment that is relied on for the mitigation strategies for beyond-design-basis events without regard to whether the equipment is ''FLEX equipment'' as defined in NEI 12–06 or ''plant equipment'' as that term is used in NEI 12–06. Accordingly, the set of requirements that are applicable, and by direct extension, the resulting level of regulatory assurance required is directly linked to whether the SSC or equipment is performing a design-basis function or a beyond-design-basis function. The level of assurance is established by the function performed by the SSC, not by the equipment or SSC alone.

D. Loss of All Alternating Current Power

The NRC received comments concerning the loss of all ac power requirement in proposed § 50.155(b)(1). Several commenters indicated that the assumed damage state for developing the mitigation strategies and guidelines for beyond-design-basis external events must include a loss of all power systems including the loss of ac power from batteries through inverters and direct current (dc) power direct from batteries. The commenters stated that unless this damage state is assumed, the lessons learned from the Fukushima Dai-ichi event would not be fully addressed. Another set of commenters stated that the MBDBE proposed rule's requirements for a loss of all ac power must be revised to align with the definition of an extended loss of ac power (ELAP) in the industry guidance document developed for the Mitigation Strategies Order. In that ELAP definition, power directly or indirectly from batteries is assumed available. These commenters also suggested that the word ''all'' should be removed from the MBDBE rule requirements for ''loss of all ac power'' to align the requirement with the definition of ELAP. Based on this feedback, the NRC concluded that the MBDBE proposed rule language and supporting statement of considerations lack clarity and therefore revised the

final rule as discussed in the next paragraph.

The final rule language and Section V.C, ''Final Rule Regulatory Bases,'' of this document are clarified to better convey that the loss of all ac power condition must be addressed. The first clarification is the deletion of the word ''extended'' from § 50.155(b)(1) because the NRC concludes that the use of the word ''extended'' contributed to the confusion regarding the requirement. Section 50.155(b)(1) requires licensees to assume a loss of all ac power in developing strategies and guidelines capable of maintaining or restoring the key safety functions, indefinitely or until the mitigation strategies are no longer needed, including the acquisition of offsite resources to sustain those functions. As such, the regulation clearly requires a capability to address an ''extended'' loss of ac power, and the word ''extended'' is not necessary in § 50.155(b)(1). The deletion of the word ''extended'' is intended to avoid confusion between the requirement for licensees to address a loss of all ac power and the condition of an ELAP as defined in the industry guidance. The regulatory guidance for the MBDBE rule, RG 1.226, addresses the loss of all ac power, including ac power from inverters fed by batteries or dc power directly from batteries as follows:

1. An ELAP and loss of normal access to the ultimate heat sink (or loss of access to the normal heat sink for passive power reactor designs), hereafter referred to as LUHS, is assumed for the purposes of developing the supporting analysis, determining the resultant conditions, and establishing times for key actions that support the development and implementation of mitigation strategies providing additional capability for beyond-design-basis external events. As discussed above, an ELAP is defined in the regulatory guidance as a loss of ac power sources but assumes the availability of power directly or indirectly from batteries.

2. To address conditions more severe than the assumed conditions discussed above (*i.e.,* potentially including loss of power from batteries) and thereby provide a set of regulatory guidance that implements the loss of all ac power requirement of the MBDBE rule, the mitigation strategies contain contingencies. These contingencies involve sending personnel to locally and manually operate non-ac driven core cooling pumps (*e.g.,* a turbine-driven auxiliary feedwater or reactor core isolation cooling pump) to maintain or restore core cooling. These contingencies include the capability to obtain instrument readings using portable multimeters at locations that do not rely on the functioning of intervening installed electrical equipment.[1]

E. Multiple Source Term Dose Assessment

As a result of the NRC's consideration of NTTF recommendations 9.1 and 9.3, the proposed MBDBE rule included a requirement for licensees to determine the magnitude of, and continually assess the impact of, the release of radioactive materials, including from all reactor core and SFP sources. This proposed requirement is referred to as ''multiple source term dose assessment,'' as each source (*e.g.,* core or SFP) has a specific ''source term'' of radionuclides that could be released in an accident.

The NRC received a public comment concerning its § 50.109 backfitting justification for the proposed multiple source term dose assessment requirements. The comment indicated that while the NRC had correctly identified these requirements as backfits, it had failed to justify their proposed imposition as satisfying the criterion under § 50.109(a)(4)(ii) that these proposed requirements are necessary for adequate protection of public health and safety. The commenter stated that the NRC's analysis failed to overcome the presumption that current regulations and orders ensure adequate protection and noted that the statement of considerations supporting issuance of the Backfit Rule in 1988 states that ''that presumption can be overcome only by significant new information or some showing that the regulations do not address some significant safety issue.'' The commenter also noted that beyond the extensive, required actions that licensees are already taking, the industry is voluntarily implementing multiple source term dose assessment capabilities to assist in the mitigation of remote, yet potentially serious beyond-design-basis external events. The commenter stated that the NRC needs to provide a systematic and documented analysis that imposition of the new requirements would result in a cost-justified substantial increase in public health and safety.

The NRC agrees that the backfit justification supporting the proposed multiple source term dose assessment requirements was insufficient. Based on the current emergency preparedness regulations in appendix E to 10 CFR part 50, ''Emergency Planning and Preparedness for Production and Utilization Facilities,'' and the Mitigation Strategies Order requirements, which were implemented broadly to provide an enhanced onsite emergency response capability, the NRC concludes that there is no evidence of a safety issue that rises to the level of undue risk that would warrant imposition of multiple source term dose assessment requirements as necessary for adequate protection of public health and safety.

The NRC additionally concludes that imposition of the multiple source term dose assessment requirement would not provide a substantial increase in the protection of public health and safety under § 50.109(a)(3), taking into account the factors in § 50.109(c). This conclusion is based on the following:

1. The events that would challenge multiple source terms are rare events, and the risk associated with such events is a very small portion of the total plant risk. Furthermore, licensees' implementation of the requirements of the Mitigation Strategies Order provides a substantially enhanced mitigation capability for these events and lowers the probability that such rare events would challenge multiple source terms. These requirements constitute a significant portion of the MBDBE rule.

2. The NRC concludes that the risk of offsite consequences from the beyond-design-basis events addressed by the rule is very small based upon a review of the recent work to understand plant risk. This conclusion is based on both the state-of-the-art reactor consequence analyses (see NUREG–1935, ''State-of-the-Art Reactor Consequence Analyses (SOARCA) Report,'' November 2012), and the work performed for the containment protection and release reduction regulatory effort (see SECY–15–0085, ''Evaluation of the Containment Protection & Release Reduction for Mark I and Mark II Boiling Water Reactors Rulemaking Activities (10 CFR part 50) (RIN–3150–AJ26),'' dated June 18, 2015, specifically the enclosure entitled, ''Containment

[1] There are limitations to what instruments can be repowered by a portable multimeter. While it is possible to repower, and obtain readings from, a resistance temperature detector or a thermocouple, there are many types of sensors that would need a more specialized type of equipment to accomplish the repowering and measurement. The choice of instrument readings to obtain through these contingencies should allow a licensee to diagnose the symptoms and verify system response to confirm the success of actions taken or to select actions that should be taken in response to the symptoms. Engineering evaluations and/or calculational aids needed to facilitate the interpretation of readings from such instrumentation when taken under the beyond-design-basis external event conditions expected should be performed as part of the planning process for the mitigating strategies, and should identify constraints and limitations of such capabilities, including uncertainties in the results.

Protection and Release Reduction (CPRR) Rulemaking: Draft Regulatory Basis''). The staff's evaluation took into account the safety enhancements related to prevention of radioactive releases that were achieved through implementation of the Mitigation Strategies Order and implementation of the requirements of Order EA–13–109, ''Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Conditions,'' dated June 6, 2013, in reaching this conclusion.

3. Further, the NRC concludes that the portion of overall plant risk associated with the rare events that might challenge multiple source terms is very small. As a result, the potential safety enhancement associated with the multiple source term dose assessment requirements cannot be considered to be substantial.

Accordingly, the NRC concludes that because there would not be a substantial increase in the overall protection of public health and safety, and, because the risk to public health and safety is very small, backfitting a requirement for multiple source term dose assessment cannot be justified as a matter of adequate protection or as a cost-justified substantial safety improvement.

Finally, operating plants have installed this multiple source term dose assessment capability and have committed to maintain the capability. The NRC anticipates that licensees will maintain this multiple source term assessment capability, even without an explicit requirement. This installed capability for multiple source term dose assessment is a computer capability installed in the existing emergency preparedness infrastructure and serves to meet the existing requirements in appendix E to 10 CFR part 50 to monitor and assess the reactor source term. The NRC concludes that the optimal regulatory approach for operating licensees is to continue to maintain the multiple source term dose assessment as a voluntary initiative following the endorsed guidance that supports this rule.

The final rule was revised to remove the multiple source term dose assessment requirements.

F. Removal of the Proposed Staffing and Communications Requirements

The NRC received public comment that the proposed wording for staffing and communications requirements to be located in a new section VII of appendix E to 10 CFR part 50 could be interpreted by future readers to mean that those proposed requirements must be described in the licensee's emergency plan, notwithstanding the NRC language to the contrary. A commenter noted that the clarity of these proposed provisions could be improved if they were moved into § 50.155. The commenter proposed that these requirements could be incorporated into § 50.155 as a separate sub-paragraph.

The NRC agrees that locating the staffing and communications requirements in a new section VII of appendix E to 10 CFR part 50 would detract from clarity. Additionally, the NRC recognizes that the staffing and communications requirements in the proposed MBDBE rule were not requirements in the Mitigation Strategies Order. Instead, the issue of staffing was addressed in the implementation of the order through the inclusion of regulatory guidance on the subject in section 11.7 of each version of the industry document NEI 12–06 as endorsed by the respective versions of JLD–ISG–2012–01 and taken into consideration by licensees in developing and implementing their strategies and guidelines. The issue of internal communications was addressed in section 3.2.2.8 of NEI 12–06 and taken into consideration by licensees in developing and implementing their strategies and guidelines. The issue of communications between the site and offsite response organizations was a subject covered in the March 12, 2012 request for information issued under § 50.54(f), which resulted in licensees making commitments to upgrade their communications capabilities. These upgraded communications capabilities became part of the licensees' final integrated plans for the strategies and guidelines under the Mitigation Strategies Order.

The NRC concludes that the requirements imposed by the Mitigation Strategies Order were sufficient to provide reasonable assurance of adequate protection and no new information was developed with regard to staffing and communications that would modify this conclusion. The NRC concludes that the imposition of requirements for staffing and communications would not result in a substantial increase in the overall protection of public health and safety or the common defense and security. This follows the Commission's direction in SRM–SECY–11–0124 that

> [i]n order to be effective, approaches should be flexible and able to accommodate a diverse range of circumstances and conditions. In consideration of events beyond the design basis, a regulatory approach founded on performance-based requirements will foster development of the most effective and efficient, site-specific mitigation strategies, similar to how the agency approached the approval of licensee response strategies for the ''loss of large area'' event under its B.5.b program.

As a result, the imposition of requirements for staffing and communications would not meet the provisions of the Backfit Rule.

The final rule was revised to remove the staffing and communications requirements.

G. Cumulative Effects of Regulation Feedback, Removal of Requirements for Drills or Exercises, Removal of Requirements for Command and Control, and Withdrawal of Orders

The NRC was aware that the nuclear industry would be challenged by the proposed 2-year compliance date for the MBDBE rule, and requested feedback focused on whether this provided sufficient time to address the reevaluated hazard information. Additionally, the proposed rule contained the standard CER questions that also sought feedback on whether the implementation of the MBDBE requirements might involve CER.

The NRC received feedback that indicated that the degree to which the proposed reevaluated seismic or flooding hazards could impact the implementation of mitigation strategies varies widely across the operating reactor fleet and the various evaluations necessary to prepare for any necessary modifications are in different stages of completion. The NRC considered using a flexible scheduling provision in the final rule to address this concern but concluded that this would not be necessary in light of the removal of requirements to address the reevaluated hazards from the final rule. From a more general perspective, CER feedback indicated that circumstances of each plant's implementation of the final rule requirements would be unique and there may be instances where licensees would need to request additional time for full implementation of the rule. One commenter stated that there will likely be instances where conflicts will arise in the implementation of the MBDBE rule requirements, and that the NRC should allow licensees the latitude to resolve the conflicts in a manner that best meets the objectives of safety and security, including allowing licensees to prioritize regulatory activities where conflicts in schedule are identified or provide alternative means for compliance in instances where conflicts require an alternative to be established. The commenter also advocated that the NRC support the use of risk-informed decision making consistent with the Commission direction on SECY–15–

0050, ''Cumulative Effects of Regulation Process Enhancements and Risk Prioritization Initiative,'' dated April 1, 2015.

Other CER feedback concerned a potential unintended consequence that may occur if implementation of the MBDBE rule conflicts with the existing order requirements. The commenter said that the NRC should set forth a transparent transition from the Mitigation Strategies and SFPI Orders to § 50.155. All operating power reactor licensees have achieved compliance with the orders using approved guidance (JLD–ISG–2012–01, ''Compliance with Order EA–12–049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,'' and JLD–ISG–2012–03, ''Compliance with Order EA–12–051, Reliable Spent Fuel Pool Instrumentation''). The MBDBE rule and the supporting RGs could be perceived to specify actions that are in addition to, or different from, the actions taken by licensees following the approved guidance to achieve compliance with the NRC orders, including actions that could be less restrictive than the corresponding actions needed for compliance with the orders. Further, the NRC received a comment that there is a lack of clarity regarding the difference between compliance with the orders and issuance of § 50.155 and the associated RGs. To avoid unintended consequences associated with two similar—but potentially not identical—sets of requirements, it was commented that the NRC should withdraw the Mitigation Strategies and SFPI Orders once § 50.155 becomes effective.

Additionally, stakeholders provided CER feedback concerning a potential schedule conflict for new plants regarding the need to perform analyses that were proposed as section VII to appendix E to 10 CFR part 50 and the completion of the inspections, tests, and analyses under the 10 CFR part 52 framework.

Finally, the NRC held a public meeting to discuss CER. During this meeting, a representative of the Boiling-Water Reactor Owners Group pointed out that those licensees that received Order EA–13–109, which was issued more than a year after the Mitigation Strategies and SFPI Orders, would have less time after attaining full compliance with Order EA–13–109 than other licensees to complete training and verify that they have completed all preparations to comply with the MBDBE rule.

The NRC agrees that the group of licensees that received Order EA–13–109 would achieve full compliance with each of the orders issued in response to the Fukushima Dai-ichi event approximately one year after the remaining licensees. In order to alleviate CER for this group of licensees, the final rule is revised to provide an additional year for implementation, giving this group of licensees the same amount of time after full compliance with the orders to attain compliance with the rule.

The NRC also agrees that redundancy would exist between requirements in the Mitigation Strategies and SFPI Orders and those in the MBDBE rule. The final rule contains language that is intended to ensure a smooth transition between the order requirements and the MBDBE rule, including withdrawing the orders, to alleviate this issue.

Finally, the schedule issue associated with new reactors was resolved as a result of the removal of the staffing and communication requirements in favor of their treatment in the regulatory guidance for the rule. As a result of the revision made to the MBDBE rule, the scheduling requirements that were of concern are no longer operative.

Additionally, the NRC received feedback suggesting that licensees that received Order EA–13–109 be allowed an additional year for conducting an initial drill or exercise under the proposed rule. Holders of operating licenses for power reactors (including those that received Order EA–13–109) would have been required to conduct an initial drill or exercise within 4 years of the effective date of the final MBDBE rule under this paragraph. The NRC noted that the conduct of drills or exercises was not included as a requirement in the Mitigation Strategies Order, instead being an element of an acceptable approach to meeting the order's requirement for training. Drills are addressed in the regulatory guidance for the Mitigation Strategies Order contained in section 11.6.5 of NEI 12–06, as endorsed by JLD–ISG–2012–01 and carried forward to the regulatory guidance for the final rule. NEI 12–06, Revisions 0 and 2 contained guidance on the content and periodicity of these drills, specifying the same 8-year period as was proposed for this rule. NEI 12–06, Revision 4, which is endorsed by the final version of Regulatory Guide 1.226, incorporates by reference further guidance on the performance of drills contained in the industry document NEI 13–06, Revision 1, ''Enhancements to Emergency Response Capabilities for Beyond Design Basis Accidents and Events,'' which also specifies the 8-year period that was proposed for drill performance for this rule. In addition, Appendix E of NEI 12–06, Revisions 2 and 4 includes guidance on the validation of time sensitive actions. Validation of the time sensitive actions has been performed by all operating power reactor licensees in order to ascertain that they are capable of executing the time sensitive actions necessary to perform the strategies and guidelines required under the Mitigation Strategies Order and under the final rule in sufficient time to meet the time constraints determined by a plant-specific thermal-hydraulic analysis. These validations included, for example, the use of timed drills in simulators for control room actions or physical walkthroughs for actions in the field to demonstrate that the operating staff could perform the time sensitive actions within the identified time constraints.

The NRC concludes that the requirements imposed by the Mitigation Strategies Order were sufficient to provide reasonable assurance of adequate protection and no new information was developed with regard to drills or exercises that would modify this conclusion. The NRC similarly concludes that imposing a requirement for drills and exercises would not provide a substantial increase in the overall protection of public health and safety. Therefore, the imposition of a requirement for drills or exercises would not meet the provisions of the Backfit Rule. The requirement for drills and exercises has been removed from the final rule. The removal of the requirement for an initial drill or exercise from the final rule addresses the commenter's concerns with scheduling of drills for licensees that received Order EA–13–109.

The NRC also received feedback on CER suggesting that flexible scheduling be extended to licensees that received Order EA–13–109 for reasons other than addressing reevaluated hazards. No changes were made to the final MBDBE rule as a result of this feedback. The NRC concludes that any need for further schedule flexibility can be addressed under § 50.12 on an individual basis if it becomes necessary.

The NRC also received stakeholder feedback supporting the command and control requirements in proposed § 50.155(b)(6). The proposed MBDBE rule would have required licensees to have a supporting organizational structure with defined roles, responsibilities, and authorities for directing and performing the strategies, guidelines, and alternative approaches required by proposed § 50.155(b).

The need for defined command and control structures and responsibilities

for use in beyond-design-basis conditions was recognized in the course of the development of the guidance and strategies for EDMGs. As stated in the industry's guidance document for that set of requirements, NEI 06–12, Revision 2, ''[e]xperience with large scale incidents has shown that command and control execution can be a key factor to mitigation success.'' The guidance and strategies developed for that effort include an EDMG for initial response to provide a bridge between normal operational command and control and the command and control that is provided by the emergency response organization personnel in the event that the normal command and control structure is disabled. The NRC considers that the actions taken in the development of the EDMGs for initial response for the guidance and strategies for § 50.155(b)(2) are adequate to support implementation of the MBDBE rule requirements. Evidence of this was demonstrated in the implementation of the EDMGs and Mitigation Strategies Order without specific command and control requirements.

The NRC concludes that the requirements imposed by the Mitigation Strategies Order were sufficient to provide reasonable assurance of adequate protection and no new information was developed with regard to command and control that would modify this conclusion. The NRC concludes that the imposition of requirements for command and control would not result in a substantial increase in the overall protection of public health and safety or the common defense and security. This follows the Commission's direction in SRM–SECY–11–0124 that

> [i]n order to be effective, approaches should be flexible and able to accommodate a diverse range of circumstances and conditions. In consideration of events beyond the design basis, a regulatory approach founded on performance-based requirements will foster development of the most effective and efficient, site-specific mitigation strategies, similar to how the agency approached the approval of licensee response strategies for the ''loss of large area'' event under its B.5.b program.

As a result, the imposition of requirements for command and control would not meet the provisions of the Backfit Rule.

The final rule has been modified to allow one additional year for implementation for operating power reactor licensees that received NRC Order EA–13–109, to remove the proposed requirement for drills or exercises, to remove the proposed requirement for command and control, and to provide for the withdrawal of the Mitigation Strategies and SFPI Orders and associated license conditions.

H. Change Control Enhancements

The NRC requested and received comments on the proposed MBDBE change control provisions. Commenters suggested that the NRC should consider a ''prior review and approval'' type of regulatory approach, and cited as an example the ''reduction in effectiveness'' criterion that is used in several existing change control requirements. The concern expressed by commenters is associated with the potential for licensees to make changes to the implementation of the MBDBE rule requirements that are outside endorsed guidance. Another commenter echoed this concern, citing examples of licensees not properly implementing the mitigation strategies and citing violations associated with the implementation of the requirements of § 50.59, ''Changes, tests, and experiments.'' The NRC also received a comment recommending a reporting requirement be part of the change control provisions. The NRC received comments concerning the statement of considerations, which confused stakeholders and suggested that prior review and approval may still be required. Finally, the NRC received comments suggesting revisions to the change control requirements that were intended to clarify the requirements.

The NRC finds that its basic approach to change control does not need revision. Specifically, the NRC continues to conclude that it does not need to include reporting requirements or criteria for prior NRC review and approval of changes. The suggestion for use of a ''reduction in effectiveness'' criterion was understood to be an example of a ''prior review and approval'' type criterion, and the NRC considered both of those specific examples and any others that it could identify. First, the NRC concluded that use of a ''reduction in effectiveness'' or equivalent type of change control criterion would not clearly differentiate significant changes (that would warrant NRC prior review) from changes not warranting prior review.

Second, given the deterministic regulatory approach followed for development and implementation of the strategies under the Mitigation Strategies Order, many potential changes could have aspects that tend to reduce the effectiveness while also having aspects that tend to improve the effectiveness of the mitigation strategies. For example, replacing a portable diesel-driven pump with a similar one of a larger size could improve the effectiveness of a mitigation strategy by allowing for greater flow rates of makeup water but reduce its effectiveness because of a higher fuel usage rate and an associated shorter run time without refueling. Judging such changes using a prior review and approval type of approach is challenging at best and would very likely result in an unwarranted diversion of licensee and NRC resources to review and approve changes.

Other beyond-design-basis provisions currently applicable to operating reactors in § 50.62, ''Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants,'' § 50.63, and § 50.54(hh) do not contain change control requirements. The only comparable set of requirements addressing beyond-design-basis events containing provisions that address the control of changes is § 50.150, ''Aircraft impact assessment,'' which is applicable to new reactors. Reviewing that requirement, and noting that the Aircraft Impact Assessment Rule requires that changes meet certain assessment requirements, the NRC concluded that the provisions in § 50.155(f) for documentation of changes are well aligned with the Aircraft Impact Assessment Rule's control of changes provisions because the NRC is requiring that changes be demonstrated to satisfy the requirements of § 50.155.

Finally, the NRC concludes that its regulatory approach that relies on inspection and enforcement will identify any substantial problems with a licensee's MBDBE change control process well before such problems present a safety problem. Based on consideration of the feedback provided, the NRC did not find a suitable criterion (or criteria) that the NRC judged would result in a substantial improvement over what was proposed for addressing changes in the proposed rule, and accordingly the final rule continues with the same approach: Licensees must demonstrate that the proposed change will result in continued compliance with the requirements of § 50.155, licensees must maintain documentation of those changes, and the NRC will oversee through inspection the changes and take enforcement action as appropriate.

Notwithstanding this conclusion, the NRC clarified Section VI of this document to address changes that apply neither to endorsed guidance nor approved alternatives. This section now includes examples of cases that the NRC concludes would not result in demonstrated compliance.

The NRC agrees that there was confusion created when it described the potential for licensees that may wish to consult with the NRC concerning changes to the implementation of the MBDBE rule requirements. This was not intended to suggest that the NRC was requiring a prior review of changes, and this document is revised accordingly.

Finally, the NRC agrees with suggested revisions to the provisions that result in clarification of the requirements. The NRC clarified the final requirements to refer to them as ''Documentation of Changes,'' simplified the provisions by combining two of the proposed provisions, clarified the provision that addresses the application of other change control processes, and removed the word ''all'' from the rule regarding the need to maintain documentation of changes. As a result, the NRC concludes it is necessary to provide additional description in the statement of considerations to clarify what constitutes a ''change'' with regard to the documentation that the NRC requires licensees to maintain. Changes to the implementation of the MBDBE requirements that do not result in a significant change to the functional performance of the equipment and also do not significantly impact the strategies and guidelines would not constitute a ''change'' for this purpose. The NRC recognizes that licensees would maintain all of this documentation as part of their normal procurement and configuration control processes, but for the regulatory purposes of § 50.155(f), these types of changes would not be significant in terms of implementation of the MBDBE requirements. For example, a replacement of a FLEX pump with a pump having the equivalent functional performance (*i.e.,* no significant impact to functional performance), equivalent weight, size, and mobility (*i.e.,* no significant impact to staging and deploying the pump), and equivalent connections would not constitute a ''change'' for the purposes of § 50.155(f).

I. Spent Fuel Pool Instrumentation Requirements

The NRC received several comments that the MBDBE rule must keep the requirements for SFPI separate and distinct from the requirements for mitigation strategies. The commenters noted that the requirement for SFPI was issued by the SFPI Order, while the requirement for mitigation strategies was issued by the Mitigation Strategies Order. The commenters further noted that while the two orders were in response to lessons learned from the Fukushima Dai-ichi event, they are distinctly different in underlying purpose and character.

The NRC agrees with these comments and revised the final rule to keep SFPI and mitigation strategies requirements separate. The MBDBE rule provisions in § 50.155(b)(1), which were initially imposed through the Mitigation Strategies Order, require strategies and guidelines to maintain or restore core cooling, containment, and SFP cooling capabilities for beyond-design-basis external events, and these requirements are independent of those initially imposed in the SFPI Order and now located in § 50.155(e). The SFPI requirements ensure that information regarding the SFP is provided to decision makers to enable the prioritization of resources. The SFPI requirements were not intended to support mitigation action, but to simply provide information. Accordingly, the NRC moved the SFPI requirement to § 50.155(e) and decoupled the requirement from § 50.155(b)(1) to ensure it remains independent of mitigation strategies requirements.

As part of the industry response to the Mitigation Strategies Order, licensees used the SFPI to support mitigation strategies to maintain or restore SFP cooling. If licensees use the SFPI to comply with § 50.155(b)(1), then the SFPI would be subject to the requirements of § 50.155(b)(1).

J. Drill Frequency

The NRC received comments regarding the proposed 8-year frequency for performance of drills under the proposed rule. One commenter expressed the view that there is a relatively high frequency of extreme events, and given the potentially high consequences associated with such events, the final rule must require an exercise interval no longer than once every 3 years. The commenter noted that an 8-year frequency was too infrequent, resulting in a steady decline in capabilities between tests. Finally, the commenter expressed the view that these drills need to be comprehensive and as realistic as possible.

Another commenter suggested drills be conducted annually or every 2 years. The remaining commenters supported the proposed 8-year frequency.

As discussed in Section IV.G, ''Cumulative Effects of Regulation Feedback, Removal of Requirements for Drills or Exercises, and Withdrawal of Orders,'' of this document, the NRC concludes that the requirements imposed by the Mitigation Strategies Order were sufficient to provide reasonable assurance of adequate protection of public health and safety and no new information was developed with regard to drills or exercises that would modify this conclusion. The NRC then considered whether there would be a substantial increase in the overall protection of the public health and safety or the common defense and security that would result from including requirements in the final rule for drills or exercises rather than continuing the practice of addressing them in the regulatory guidance as had been done for the Mitigation Strategies Order. The NRC concluded that, while there would be some benefit in the form of clarity as to what had been found acceptable for compliance with the orders being made generically applicable in this rulemaking, the recharacterization of drills or exercises from regulatory guidance to requirements would not constitute a substantial increase in the overall protection of the public health and safety or the common defense and security.

Because of this, the NRC concludes that a separate requirement for drills or exercises would not be needed, but could constrain an existing licensee or an applicant for a new licensee from developing innovative training techniques that do not rely on drills or exercises. This follows the Commission's direction in SRM–SECY–11–0124 that

> [i]n order to be effective, approaches should be flexible and able to accommodate a diverse range of circumstances and conditions. In consideration of events beyond the design basis, a regulatory approach founded on performance-based requirements will foster development of the most effective and efficient, site-specific mitigation strategies, similar to how the agency approached the approval of licensee response strategies for the ''loss of large area'' event under its B.5.b program.

In addition, the NRC did not revise the MBDBE drill frequency because it is specified in the regulatory guidance for the final rule in response to these comments. The NRC concluded that the 8-year periodicity strikes the correct balance in terms of providing an appropriate level of regulatory assurance, and, by aligning with the current emergency preparedness exercise requirements, it provides licensees with flexibility should they choose to implement the drills in conjunction with emergency preparedness drills or exercises.

K. Consideration of Explicit Requirements for a Three-Phase Response

The NRC received a comment that the MBDBE rule should maintain the three-phase response structure for mitigation that was described in the Mitigation Strategies Order rather than use the proposed rule's performance-based requirements. The commenter stated that the substitution of ''higher level, performance-based requirements'' reduces confidence that the MBDBE measures will be successful if needed. It is the commenter's view that the nuclear industry and the NRC have consistently disagreed on what constitutes appropriate compensatory measures and associated administrative controls and provided an example to support the comment. The commenter expressed the view that the three-phase structure provides clearer definition of what is expected, better enabling licensees to meet those expectations and NRC inspectors to independently verify that this desired outcome has been achieved.

The NRC did not revise the MBDBE rule as a result of this comment. The Mitigation Strategies Order included a separate attachment 3 for the imposition of requirements on Vogtle Electric Generating Plant, Units 3 and 4 to reflect their use of the AP1000 design. In the Mitigation Strategies Order, attachment 3, the NRC documented that the inherent features of the AP1000 design obviate the need for phase two of the three-phase response required of currently operating power reactors that is addressed in attachment 2 of the Mitigation Strategies Order. The RG 1.226 provides implementation guidance for the three-phase approach as one acceptable method of complying with the MBDBE rule. Future designers may be able to develop and implement strategies and guidelines that do not rely on a three-phase approach, and may propose alternative approaches as updates to the existing guidance or in their applications.

This framework is consistent with the Commission's direction in SRM–SECY–11–0124 to follow performance-based approaches for beyond-design-basis events, while harmonizing the treatment of currently operating and new power reactors. Such approaches allow greater flexibility and enable more effective and efficient implementation of the requirements. The NRC, through its current review, audit, and inspection activities supporting implementation of the Mitigation Strategies Order, is identifying differences of interpretation such as those noted by the commenter and ensuring that they are resolved.

L. Clarifications to Decommissioning Provisions

The NRC received comments concerning the proposed MBDBE provisions in § 50.155(a)(3) regarding the applicability of the MBDBE rule to licensees with reactors in a decommissioning phase. The commenters agreed with the underlying approach to the MBDBE decommissioning provision and suggested revisions to clarify those provisions and eliminate unnecessary language.

The NRC agrees with some of the suggestions, and the final rule reflects those changes. Section 50.155(a)(2) in the final rule explicitly identifies which portions of the MBDBE rule apply to a licensee as it proceeds through the decommissioning process.

M. Clarifications to Equipment Requirements and Removal of Proposed Maintenance Requirement

The NRC requested feedback concerning the proposed maintenance provision in § 50.155(c)(3). The Mitigation Strategies Order did not contain a specific maintenance requirement, but instead contained a performance-based requirement ''to develop, implement and maintain strategies.'' This same language was included in proposed § 50.155(b)(1), so that a failure to perform adequate maintenance would likely lead to a failure to meet this requirement.

The feedback indicated that commenters did not see a need for a separate maintenance provision in § 50.155(c)(3) for the § 50.155(b)(1) equipment. Commenters noted that the proposed maintenance requirement of § 50.155(b), along with the guidance in NEI 12–06, as endorsed by JLD–ISG–2012–01 for the Mitigation Strategies Order (now endorsed in RG 1.226), adequately addresses equipment maintenance. The NRC agrees with this feedback. The intent is to carry forward the maintenance requirements of the Mitigation Strategies Order as it was included within the order's requirement for licensees to develop, implement, and maintain the strategies. The corresponding requirement for development, implementation and maintenance of the strategies is included in § 50.155(b) and the proposed separate maintenance requirement is removed from the final rule.

Regarding maintenance, the NRC also received feedback suggesting that the MBDBE rule be revised to state that the Maintenance Rule, § 50.65, ''Requirements for monitoring the effectiveness of maintenance at nuclear power plants,'' does not apply to FLEX equipment or SFPI whose primary design function is to support strategies developed to solely comply with the MBDBE rule. The NRC agrees that the criteria in § 50.65(b) do not include FLEX equipment in the scope of § 50.65 if the FLEX equipment is used solely for compliance with § 50.155.[2] Accordingly, the suggested revision is not necessary. Furthermore, such an addition could result in complications if a licensee chooses to use FLEX equipment in a future regulatory application (separate from § 50.155) that would result in the equipment meeting the scoping criteria in § 50.65.

In response to one comment, the NRC changed § 50.155(c)(1) in the final rule to more clearly communicate the equipment capacity and capability requirements. The remaining changes to

[2] In the event that a licensee relies upon the mitigation strategies equipment for other purposes such as mitigation of a design-basis event, the application of scoping criteria for reliance on the equipment for those purposes would govern. As a result, equipment that has multiple purposes could have design-basis functions that fall within the scope of the Maintenance Rule for one purpose, and a mitigation strategy function that is not covered by the Maintenance Rule, but instead within scope for the maintenance programs established under § 50.155 through the guidance of Regulatory Guide 1.226 and NEI 12–06. For example, a turbine-driven auxiliary feedwater (TDAFW) pump in a pressurized-water reactor would fall within the scope of the monitoring requirements of § 50.65(a) under the criteria of § 50.65(b) for those functions that meet the criteria, but not for the performance of beyond-design basis functions for the strategies and guidelines required by § 50.155. As a result, the monitoring under § 50.65(a) would be with the goal of providing reasonable assurance that the TDAFW pump is capable of fulfilling its intended safety function (*i.e.,* specific function) within the reference bounds of the design bases as defined in § 50.2 for the functions that result in its inclusion in the scope of § 50.65. The capability of the TDAFW pump to remain functional in the context of a loss of all ac power concurrent with an LUHS, which could expose the pump to environmental and operational constraints outside the reference bounds of the design bases for the events resulting in inclusion in the scope of § 50.65(a) due to a longer period with an absence of normally available cooling, would not be addressed by the § 50.65(a) monitoring program, but instead by the maintenance and testing programs established under § 50.155 through the guidance of RG 1.226 and NEI 12–06.

Similarly, some licensees rely on a portable, ac-power independent pump for the strategies and guidelines developed under § 50.155(b)(1), (2), or (3). These strategies and guidelines may be referred to in the licensee's EOPs, but are not necessary in order to conform to the NRC-approved emergency planning guidelines that form the basis for the EOPs. Therefore, because the portable, ac-power independent pump is not used in the EOPs, it would not be one of the nonsafety-related SSCs included within the scope of § 50.65(a)(1) under § 50.65(b)(2)(i), unless otherwise required by § 50.65(b). Further details on scoping of equipment under § 50.65 are provided in NUMARC 93–01, ''Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.''

paragraph (c) in § 50.155 are discussed in the ''Reasonable Protection,'' ''Spent Fuel Pool Instrumentation,'' and ''Removal of the Proposed Staffing and Communications Requirements'' sections of this portion of the document.

N. Removal of Integration Requirements

In the proposed MBDBE rule, the NRC had included a potential requirement for an overarching integrated response capability including the mitigation strategies for beyond-design-basis external events and the EDMGs and an organizational structure specific to the integrated response capability. In addition, the proposed MBDBE rule included a potential requirement for integration of the integrated response capability with the existing emergency operating procedures. In reexamining the requirements of the proposed MBDBE rule, the NRC recognized that the implementation of the strategies and guidelines under Order EA–02–026, ''Interim Safeguards and Security Compensatory Measures,'' dated February 25, 2002, which resulted in the EDMGs included in § 50.155(b)(2), and the implementation of the strategies and guidelines under the Mitigation Strategies Order that constitute the remainder of the proposed integrated response capability, had both included a need for integration at the regulatory guidance level. For example, the regulatory guidance in NEI 12–06 for the Mitigation Strategies Order covers the interactions between the procedures developed under the order and their interfaces with various accident mitigation procedures to result in an overall coherent and comprehensive structure in section 11.4, ''Procedure Guidance.'' In addition, this regulatory guidance, which provides one acceptable means of complying with the order, includes a need for validation of the resulting strategies to show they are feasible; this validation included drills and walkthroughs of the resulting procedural documentation to show that it can be executed by the personnel that would need to use the strategies in an actual event. The NRC concludes that the requirements imposed by the Mitigation Strategies and the Interim Safeguards and Security Compensatory Measures Orders were sufficient to provide reasonable assurance of adequate protection and no new information was developed with regard to integration that would modify this conclusion. In addition, the NRC concludes that requirements for integration would not result in a substantial increase in the overall protection of public health and safety. Therefore, imposing requirements for an integrated response capability and integration with the existing emergency operating procedures would not meet the provisions of the Backfit Rule. The final rule has been revised to remove the proposed requirements for an integrated response capability and integration with the existing emergency operating procedures.

O. Training

The proposed MBDBE rule included potential requirements for training that included qualification of personnel and the use of the systems approach to training as defined in § 55.4, ''Definitions.'' The training requirement in the proposed rule carried forward a requirement for training from the Mitigation Strategies Order. The elements of this requirement for qualification and the use of the systems approach to training were addressed in the regulatory guidance for the Mitigation Strategies Order. The NRC concluded that the requirements imposed by the orders were sufficient to provide reasonable assurance of adequate protection of public health and safety and no new information was developed with regard to qualification or the systems approach to training that would modify this conclusion. The NRC also considered whether there would be a substantial increase in the overall protection of the public health and safety or the common defense and security that would result from including requirements in the final rule for qualification or the systems approach to training rather than continuing the practice of addressing them in the regulatory guidance as had been done for the orders. The NRC concluded that, while there would be some benefit in the form of clarity as to what had been found acceptable for compliance with the orders being made generically applicable in this rulemaking, the recharacterization of those items from regulatory guidance to requirements would not constitute a substantial increase in the overall protection of the public health and safety or the common defense and security.

The NRC concludes that a separate requirement for qualification and the systems approach to training is not needed, but could constrain an existing licensee or an applicant for a new licensee from developing innovative mitigation strategies that do not rely on them. This follows the Commission's direction in SRM–SECY–11–0124 that

> [i]n order to be effective, approaches should be flexible and able to accommodate a diverse range of circumstances and conditions. In consideration of events beyond the design basis, a regulatory approach founded on performance-based requirements will foster development of the most effective and efficient, site-specific mitigation strategies, similar to how the agency approached the approval of licensee response strategies for the ''loss of large area'' event under its B.5.b program.

The final rule has been revised to remove requirements for qualification and the use of the systems approach to training.

P. Discussion of Four Topics That Were Addressed Generically

The NRC received a number of comments that fell into four topical areas. The comments were considered and addressed generically. These comments did not result in changes to the MBDBE rule. A discussion of these topics is provided below.

1. Comments That Suggest a Completely Different Approach to Mitigation of Beyond-Design-Basis Events

Several commenters provided feedback that the MBDBE rule should contain requirements that address various specific external events. The suggestions included geomagnetic disturbances (which are addressed separately in Section III, ''Petitions for Rulemaking,'' of this document because they are the subject of a petition for rulemaking currently under consideration by the NRC), cyber events that might disable the electric grid, attacks involving devices that may disable the electric grid, malicious attacks on a nuclear facility, and explosions from gas lines running in the vicinity of a nuclear facility. These comments suggest that the NRC take a different regulatory approach in the MBDBE rule than the NRC took under the Mitigation Strategies Order following the Fukushima Dai-ichi event. The comments tend to explicitly identify external events or conditions that commenters believe should be addressed by the MBDBE rule.

Rather than following the approach suggested by these commenters, the NRC is continuing with the regulatory approach taken with the issuance of the Mitigation Strategies Order. The order requires licensees to postulate a challenging damage state that exceeds the design basis, and to develop and implement the mitigation strategies to address that damage state. These strategies give licensees a capability for the mitigation of beyond-design-basis external events. This regulatory approach provides additional mitigation capability as well. Given the unbounded nature of the beyond-design-basis external events to which these

requirements are directed, the NRC determined that licensees need to address uncertainty by assuming a challenging damage state that such events might create, and then adding to that damage state the consideration of the effects the initiating event may have on the physical protection of equipment and strategies. For a more detailed explanation of this response, refer to the NRC response to General Comment 9 in the Comment Response Document (see Section XIX of this document).

2. Comments That Suggest the NRC Revisit Issues Associated With SFP Safety

These comments included suggestions that the NRC, as part of the MBDBE rule, should reconsider SFP fires, events that can lead to SFP fires, malicious attacks involving SFPs, SFP integrity during and following extreme events, and longer-term SFP aging issues. The Commission has previously considered these issues, and the NRC concluded that it was not within the scope of the MBDBE rule to revisit these SFP safety issues. Moreover, the MBDBE rule is addressing and enhancing SFP safety through the imposition of regulations that (1) require licensees to have strategies that maintain or restore SFP cooling capabilities for beyond-design-basis external events, and (2) provide information, through the use of SFPI, that enables operators to appropriately prioritize the use of resources following a beyond-design-basis external event. Explanations of the NRC's considerations of the commenters' issues are provided in the NRC response to General Comment 8 in the Comment Response Document. (See Section XIX of this document.)

3. Comment Regarding Decommissioning

The NRC received comments from stakeholders that were directed towards the basis for previous NRC exemption decisions regarding power reactor licensees in decommissioning. While the MBDBE rule does include provisions that facilitate the reduction of its requirements at the appropriate points within the decommissioning process, the rulemaking's regulatory scope does not include revisiting the bases for previous decisions on decommissioning exemptions. Instead, the MBDBE rule is enabling systematic removal of the mitigation strategies requirements as a facility proceeds through the process of decommissioning. The NRC enables these requirements to be removed through regulation, rather than requiring removal by the more resource-intensive exemption process, based on the same set of acceptance criteria that were used in granting the exemptions to licensees in decommissioning. Concerns about the NRC's decommissioning regulations should be raised in the ongoing regulatory effort to more broadly address decommissioning issues for all applicable requirements. (See ''Regulatory Improvements for Decommissioning Power Reactors; Advance notice of proposed rulemaking'' (80 FR 72358; November 19, 2015).) If, as a result of that regulatory effort, the NRC changes its position with regard to the bases for decommissioning and, specifically, if those changes affect the decommissioning provisions that are part of the MBDBE rule, then the NRC will make future conforming changes to the MBDBE rule to align it with the revised decommissioning requirements.

4. Comments on Geomagnetic Disturbances

The NRC received comments on the subject of geomagnetic disturbances. While these could be viewed as comments on a specific beyond-design-basis external event, the NRC determined that the issue warrants discussion given the NRC's ongoing consideration of geomagnetic disturbances. Although the MBDBE rule puts in place mitigation strategies that could be initially deployed and used to address the effects of geomagnetic disturbances (should such disturbances lead to adverse impacts on the transmission system and an associated loss-of-offsite power), the rulemaking's regulatory scope does not address the issue of geomagnetic disturbances in its entirety. The impact of geomagnetic disturbances is the subject of PRM–50–96, which the NRC accepted for consideration within its rulemaking process. The NRC published this determination in the **Federal Register** on December 18, 2012 (77 FR 74788). Accordingly, while not fully addressed within the MBDBE rule, the issue of geomagnetic disturbances will be addressed as part of the NRC's consideration of PRM–50–96, as discussed in Section III of this document.

V. Discussion

A. Rulemaking Objectives

The MBDBE rule accomplishes the following objectives: (1) Makes the requirements in the Mitigation Strategies and SFPI Orders generically applicable, giving consideration to lessons learned from implementation of the orders and public comment on the MBDBE proposed rule and (2) addresses issues raised by PRMs that were submitted to the NRC.

1. *Makes the requirements in the Mitigation Strategies and SFPI Orders generically applicable, giving consideration to lessons learned from implementation of the orders and public comment on the MBDBE proposed rule.*

This final rule places the requirements in the Mitigation Strategies Order and SFPI Order into the NRC's regulations so that they apply to all current and future power reactor applicants and provides regulatory clarity and stability to power reactor licensees. In the absence of this rule, these requirements would need to be imposed on new reactor applicants or licensees through additional orders or license conditions (as was done for all combined licenses (COLs) issued to date). As part of this rulemaking, the NRC considered stakeholder feedback and lessons learned from the implementation of the orders, including any challenges or unintended consequences associated with implementation. The NRC reflected this stakeholder input in the final rule as discussed in the previous section of this document as well as in regulatory guidance for this rule.

2. *Addresses a number of PRMs submitted to the NRC.*

This rulemaking addresses, and completes the regulatory actions planned for, the five PRMs filed by the NRDC that raise issues that pertain to the technical aspects of this rulemaking. The petitions rely solely on the NTTF Report and request that the NRC undertake rulemaking in a number of areas that are addressed by this rule. This rule also addresses, in part, PRM–50–96 submitted by Mr. Thomas Popik; however, broader issues raised in that petition regarding geomagnetic disturbances remain under consideration by the NRC.

B. Rulemaking Scope

The MBDBE rule addresses a significant number of regulatory issues that stem from NRC review of the NTTF recommendations that provided the regulatory impetus for this rule:

1. NTTF recommendations 4 and 7 and portions of NTTF recommendation 11.1 regarding onsite emergency resources to support multi-unit events with SBO, including the need to deliver equipment to the site despite degraded offsite infrastructure. The implementation of licensees' responses to these provisions of the MBDBE rule is largely complete, because they were implemented under the Mitigation Strategies Order.

2. NTTF recommendation 8, and the command and control issues in NTTF recommendation 10.2.

3. Numerous requirements regarding onsite emergency response actions implemented by the Mitigation Strategies Order, including supporting guidance to implement the emergency response aspects of this rule. The specific regulatory actions related to emergency response in this rule and the associated NTTF recommendations follow:

a. Staffing and communications guidance that address NTTF recommendation 9.3 and were also discussed in NTTF recommendations 9.1 and 9.2. These regulatory issues were initially addressed in the implementation of the Mitigation Strategies Order through the regulatory guidance supporting the order. The regulatory guidance for the MBDBE rule addresses supporting facilities and equipment, as discussed in the same NTTF recommendations.

b. Training requirements and drill guidance that address NTTF recommendation 9.3 and were also discussed in NTTF recommendations 9.1 and 9.2. These regulatory issues were implemented under the Mitigation Strategies Order.

Accordingly, the MBDBE rule addresses NTTF recommendations 4, 7, 8, 9.1, 9.2, 9.3 (except for maintenance of ERDS capability throughout a beyond-design-basis external event), 10.2, and 11.1.

The MBDBE rule also addresses NTTF recommendation 9.4 to modernize ERDS. This action differs from the other regulatory actions because ERDS is not an essential component of a licensee's capability to mitigate a beyond-design-basis external event. However, ERDS is an important form of communication between the licensee and the NRC. A modernization effort for ERDS was completed voluntarily by industry prior to issuance of this rule. The NRC includes amendments in this rule to remove the technology-specific references to outdated equipment in 10 CFR part 50, appendix E, section VI, ''Emergency Response Data System.''

Severe Accident Management Guideline and Multiple Source Term Dose Assessment

The Commission considered a proposed SAMG backfit analysis, provided as part of SECY–15–0065, ''Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150–AJ49),'' dated April 30, 2015. The Commission concluded that the imposition of SAMG requirements was not warranted and, consequently, SAMGs were removed as requirements in the MBDBE rule (refer to SRM–SECY–15–0065, dated August 27, 2015). Instead, SAMGs continue to be implemented and maintained through an industry initiative. For more information on the industry implementation of SAMGs, refer to the MBDBE proposed rule.

Multiple source term dose assessment requirements were part of the proposed MBDBE rule and addressed NTTF recommendations 9.3 and 9.1. These proposed requirements are removed in the final MBDBE rule and instead have been implemented by licensees as discussed in Section IV.E, ''Multiple Source Term Dose Assessment,'' of this document.

Procedure and Guideline Integration

Procedure and guideline integration were part of the proposed MBDBE rule and addressed NTTF recommendation 8. These proposed requirements are removed in the final MBDBE rule and instead have been implemented by licensees as discussed in Section IV.N, ''Removal of Integration Requirements,'' of this document.

C. Final Rule Regulatory Bases

Applicability

This final rule applies, in whole or in part, to applicants for and holders of an operating license for a nuclear power reactor under 10 CFR part 50 or COL under 10 CFR part 52.

This rule does not apply to applicants for, or holders of, an operating license for a non-power reactor under 10 CFR part 50, because non-power reactors pose lower radiological risks to the public from accidents than power reactors. These reduced risks result from two primary features of non-power reactors: (1) The core radionuclide inventories are lower than in power reactors as a result of their lower power levels and often shorter operating cycle lengths and (2) non-power reactors have lower decay heat associated with a lower risk of core melt and fission product release in a loss-of-coolant accident than power reactors.

A holder of a general or specific 10 CFR part 72 independent spent fuel storage installation (ISFSI) license for dry cask storage is not subject to this rule for the ISFSI because the decay heat load of the irradiated fuel is sufficiently low prior to movement to dry cask storage that it can be air-cooled. This situation would also meet the criteria for ''sunsetting,'' or phased removal, of requirements (discussed later in this section of this document) if the rule were to apply to holders of such licenses.

The GE Morris facility in Illinois, which is the only SFP licensed under 10 CFR part 72 as an ISFSI, does not need to comply with this rule and is excluded by the rule applicability described in § 50.155(a). The NRC considered including the GE Morris facility within the scope of this rule but found that the age and corresponding low decay heat load of the fuel in the facility made it unnecessary. The GE Morris facility would also meet this rule's sunsetting criteria if the rule were to apply to GE Morris. While this rule leaves in force the EDMG requirements of § 50.155(b)(2), those requirements are not applicable to GE Morris because it is not a 10 CFR part 50 licensee. In the course of the development and implementation of the guidance and strategies required by § 50.155(b)(2), the NRC evaluated whether additional mitigation strategies were warranted at GE Morris and concluded that no mitigation strategies were warranted beyond existing measures, due to the extended decay time since the last criticality of the fuel stored there, the resulting low decay heat levels, and the assessment that a gravity drain of the GE Morris SFP is not possible due to the low permeability of the surrounding rock and the high level of upper strata groundwater.

Decommissioning Reactors

The MBDBE rule contains a regulatory structure for phasing out the mitigation strategies requirements for a licensee as its reactor decommissioning process proceeds. This structure consists of three phases:

1. Once fuel is removed permanently from the reactor, the mitigation strategies associated with the reactor and primary containment are no longer needed. Consequently, the requirements of § 50.155 continue to apply, but only for the SFP.

2. When the decay heat of the spent fuel is reduced to a level that provides ample time to enable ad hoc action to be taken in response to an event to sustain the SFP cooling function indefinitely, then all the requirements of § 50.155 can be removed with the exception of § 50.155(b)(2).

3. Once all fuel is removed from the SFP, all requirements of the MBDBE rule no longer apply.

The following provides a more detailed discussion of this structure and the regulatory decisions made for decommissioning licensees that provide the basis for this structure.

Once a licensee has permanently ceased operation, permanently removed

fuel from the reactor vessel, and submitted the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel required in § 50.82(a)(1) or § 52.110(a), that licensee need only comply with the requirements of § 50.155(b) through (d), and (f) associated with maintaining or restoring SFP cooling. As discussed previously, these proposed requirements are based on the Mitigation Strategies Order. The licensees for the Kewaunee Power Station, Crystal River Unit 3 Nuclear Generating Plant, San Onofre Nuclear Generating Station, Units 2 and 3, Fort Calhoun Station, Vermont Yankee Nuclear Power Station, and Oyster Creek Nuclear Generating Station submitted certifications of permanent fuel removal required by § 50.82(a)(1)(ii) after issuance of the Mitigation Strategies Order. The NRC has withdrawn the Mitigation Strategies Order for this group of NPP licensees (Shutdown NPP Group). These withdrawals were based on the NRC's conclusion that the lack of fuel in the licensee's reactor core and the absence of challenges to the containment rendered unnecessary the development of guidance and strategies to maintain or restore core cooling and containment capabilities. Consistent with these withdrawals, the MBDBE rule relieves licensees in decommissioning from the requirement to comply with the § 50.155(b) requirements to have mitigation strategies and guidelines to maintain or restore core cooling and containment capabilities. Moreover, these licensees do not need to comply with any of the other requirements in this final rule that support compliance with the § 50.155(b) requirements to have mitigation strategies and guidelines for maintaining or restoring core cooling and containment capabilities.

This MBDBE rule treats the EDMG requirements in a manner similar to the requirements for mitigation strategies developed under the Mitigation Strategies Order as made generically applicable under § 50.155(b)(1). For a licensee that has submitted the § 50.82(a)(1) or § 52.110(a) certifications, the lack of fuel in its reactor core and the absence of challenges to the containment would render unnecessary EDMGs for core cooling and containment capabilities. This licensee would not need to comply with the requirements in the MBDBE rule associated with core cooling or containment capabilities; rather, the licensee would be required to comply with the requirement to have EDMGs based on the presence of fuel in the SFP.

Once the licensee has submitted the certifications required in § 50.82(a)(1) or § 52.110(a), that licensee does not need to comply with the requirement in § 50.155(e) that the licensee provide reliable means to remotely monitor wide-range SFP levels to support effective prioritization of event mitigation and recovery actions. The requirement in § 50.155(e) makes generically applicable the requirements in the SFPI Order. This order requires a reliable means of remotely monitoring wide-range SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event with the potential to challenge both the reactor and SFP.

The NRC also withdrew the SFPI Order for the Shutdown NPP Group. These withdrawals were based, in part, on the NRC's conclusions that once a licensee certifies the permanent removal of the fuel from its reactor vessel, the safety of the fuel in the SFP becomes the primary safety function for site personnel. In the event of a challenge to the safety of fuel stored in the SFP, decision makers would not have to prioritize actions and the focus of the licensee staff would be the SFP condition. Therefore, once fuel is permanently removed from the reactor vessel, the basis for the SFPI Order no longer applies. Consistent with the NRC order withdrawals, the NRC no longer requires licensees in decommissioning to have a reliable means to remotely monitor wide-range SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event with the potential to challenge both the reactor and SFP.

The Mitigation Strategies Order also required power reactor licensees to have certain SFP cooling capabilities. In the withdrawal letters to the licensees for the Shutdown NPP Group, the NRC determined that the passage of time, the fuel's low decay heat, and the long time to boil off the water inventory in the SFP obviated the need for the Shutdown NPP Group licensees to have guidance and strategies necessary for compliance with the Mitigation Strategies Order. The withdrawal of the Mitigation Strategies Order for those licensees eliminated the requirement for them to comply with the order's requirements concerning beyond-design-basis event strategies and guidelines for SFP cooling capabilities. Consistent with the basis for the order withdrawals, licensees in decommissioning are relieved from the requirements concerning beyond-design-basis event strategies and guidelines for SFP cooling capabilities and any related requirements. These licensees have to perform and retain an analysis demonstrating that sufficient time has passed since the fuel within the SFP was last irradiated, such that the fuel's low decay heat and boil-off period provide sufficient time for the licensee to obtain offsite resources to sustain the SFP cooling function indefinitely. Licensees in decommissioning may use the equipment in place for EDMGs should that equipment be available, recognizing that the protection for that equipment is against the hazards posed by events that result in losses of large areas of the plant due to fires or explosions rather than beyond-design-basis external events resulting from natural phenomena. If the EDMG equipment is not available, offsite resources would be used by the licensee for onsite emergency response (*i.e.,* SFP cooling). This relief from the requirements related to the Mitigation Strategies Order does not impact any commitments licensees have made to support their requests for exemptions from offsite emergency planning requirements. The NRC's approval of such exemptions is based on the low radiological consequences of a beyond-design-basis event in which a loss of SFP inventory could result in a zirconium cladding fire and, conservatively, do not consider the ability to use offsite resources to mitigate such an event.

The NRC is maintaining the EDMG requirement for decommissioning plants because an event for which EDMGs would be required is not based on the condition of the fuel but may instead result from an aircraft impact or a beyond-design-basis security event that could introduce additional heat into the SFP independent from the decay heat of the fuel. These types of events and their potential consequences were considered as a part of the final rule dated March 7, 2009, on Power Reactor Security Requirements (74 FR 13926). In the course of that rulemaking, the NRC took into account stakeholder input and determined that it would be inappropriate to apply the EDMG requirements to permanently shutdown and defueled reactors where the fuel was removed from the site or moved to an ISFSI. However, the resulting rule inadvertently removed the EDMG requirements once the certifications of permanent cessation of operations and removal of fuel from the reactor vessel were submitted rather than upon removal of fuel from the SFP. The NRC is correcting this error from the 2009

final rule in this final rule as explained in the ''EDMGs'' portion of this section.

The NRC is excluding from § 50.155 the licensee for Millstone Power Station, Unit 1, Dominion Nuclear Connecticut, Inc. Dominion Nuclear Connecticut, Inc. is also the licensee for Millstone Power Station, Units 2 and 3, but this exclusion applies to Dominion Nuclear Connecticut, Inc. in its capacity as licensee for only Unit 1, which is not operating but has irradiated fuel in its SFP and satisfies the proposed criteria for not having to comply with this final rule except for the EDMG requirements. In the course of the development and implementation of the guidance and strategies required by new § 50.155(b)(2), the NRC evaluated whether additional mitigation strategies were warranted at Millstone Power Station, Unit 1 and concluded that no mitigation strategies were warranted beyond existing measures. This conclusion is based principally on the extended decay time since the last criticality occurred on November 4, 1995 and the fact that this results in low decay heat levels that allow sufficient time for the use of existing strategies. The exclusion for Millstone Power Station, Unit 1 in this rule is based upon that conclusion, with the understanding that additional mitigation capabilities will be present because of the licensee's implementation of the § 50.155(b)(2) strategies at the co-located Millstone Power Station, Units 2 and 3.

Mitigating Strategies for Beyond-Design-Basis External Events

The requirements in § 50.155(b)(1) for mitigating strategies make generically applicable requirements previously imposed on licensees by the Mitigation Strategies Order, as well as by license conditions included in the COLs held by Detroit Edison Company (for Enrico Fermi Nuclear Plant, Unit 3), Duke Energy Carolinas, LLC (for William States Lee III Nuclear Station, Units 1 and 2), Dominion Virginia Power (for North Anna Unit 3) and Florida Power and Light Company (for Turkey Point, Units 6 and 7).[3]

Recognizing that beyond-design-basis external events are unbounded, and that these events can result in a multitude of damage states and associated accident conditions, a significant regulatory challenge is developing bounded requirements that meaningfully address the regulatory issue. From a practical standpoint, development of mitigation strategies requires that there be a reasonable definition (or boundary conditions established) for an onsite damage state that the strategies would then address and thereby provide an additional capability to mitigate beyond-design-basis external event conditions that might occur. The assumed damage state should ideally capture a reasonable range of potential damage states that might occur as a result of beyond-design-basis external events and it should present an immediate challenge to the key safety functions for the facilities, so that the resultant strategies provide greater capabilities and can improve safety. An assumed damage state that accomplishes this objective is the loss of all ac power.

The MBDBE rule and the Mitigation Strategies Order both require the mitigation of a loss of all ac power condition. Both the MBDBE rule and the Mitigation Strategies Order address this requirement in two parts: (1) Through an assumed damage stage that is used to develop the strategies and guidelines for the mitigation of beyond-design-basis external events, and (2) through supporting contingencies within the strategies that address conditions that are more severe than those assumed to develop the strategies and guidelines. The assumed damage state for this rule is the same as that assumed to implement the requirements of attachment 2 to the Mitigation Strategies Order for currently operating power reactors: A loss of all ac power condition concurrent with an LUHS. This assumed damage state is effective at immediately challenging the key safety functions of core cooling, containment, and SFP cooling following a beyond-design-basis external event. Requiring strategies to maintain or restore these key functions under such circumstances results in an additional mitigation capability consistent with the Commission's objective when it issued the Mitigation Strategies Order.

As discussed in Section IV.D, ''Loss of All Alternating Current Power,'' of this document, the public comments provided on the MBDBE proposed rule showed some confusion regarding the requirement for loss of all ac power. The proposed rule contained the language ''extended loss of all ac power.'' The requirements in § 50.155(b)(1) provide for a capability to maintain or restore key functional capabilities indefinitely, or until sufficient site functional capabilities can be maintained without the need for mitigation strategies. As such, the word ''extended'' was unnecessary, and the NRC deleted it to reduce confusion with the ''ELAP'' term used in industry guidance; implementation of the requirements in § 50.155(b)(1) involves the use of contingencies that address damage states more severe than an assumed ELAP. Together, therefore, the assumed ELAP and the contingencies are the means for meeting a loss of all ac power requirement.

This MBDBE rule is not prescriptive in terms of the specific set of initial and boundary conditions assumed for the loss of all ac power and LUHS condition. The damage state for currently operating reactors, defined in more detail in RG 1.226, reflects currently operating power reactor designs and the reliance of those designs on ac power, while the assumed damage state for a future design may be different depending upon the design features. Specifically, the damage state of a loss of all ac power condition concurrent with an LUHS in the Mitigation Strategies Order was implemented first through the assumption of an ELAP, while allowing ac power from the inverters to be assumed available. This assumption is used to establish event sequence and the associated times for when mitigation actions would be assumed to be required. Secondly, to address the MBDBE rule and the Mitigation Strategies Order requirement for a loss of all ac power, including ac power from the batteries (through inverters), contingencies are included in the mitigation strategies to enable actions to be taken under those circumstances (*e.g.,* sending operators to immediately take manual control over a non ac-powered core cooling pump). As such, this provision makes generically applicable the current implementation under the Mitigation Strategies Order with no intent to either relax or impose new requirements and is performance-based to allow some flexibility for future designs. As an example, some reactor designs (*e.g.,* Westinghouse AP1000 and General Electric Economic Simplified Boiling Water Reactor (ESBWR)) use passive safety systems to meet NRC requirements for maintaining key safety functions. The inherent design of those passive safety systems makes certain assumptions, such as LUHS, inappropriate. Accordingly, the assumed condition for the mitigation strategies requirements for passive reactors is the loss of normal access to the normal heat sink, discussed further in this section. Nevertheless, in this rule the NRC is requiring that the strategies and guidelines be capable of

[3] License No. NPF–95, condition 2.D(12)(g); License No. NPF–101, condition 2.D(12)(j) and License No. NPF–102, condition 2.D(12)(j); and License No. NPF–103, condition 2.D(12)(f) and License No. NPF–104, condition 2.D(12)(h) and License No. NPF–105, condition 2.D(12)(h).

implementation during a loss of all ac power.

Regarding the assumed LUHS for COLs or applications referencing the AP1000 or the ESBWR designs, the assumption was modified to be a loss of normal access to the normal heat sink (see, *e.g.,* attachment 3 to the Mitigation Strategies Order and the Enrico Fermi Nuclear Plant, Unit 3 license, License No. NPF–95, condition 2.D(12)(g)). This modified language reflects the passive design features of the AP1000 and the ESBWR that provide core cooling, containment, and spent fuel cooling capabilities for 72 hours without reliance on ac power. These features do not rely on access to any external water sources for the first 72 hours because the containment vessel and the passive containment cooling system serve as the safety-related ultimate heat sink for the AP1000 design and the isolation condenser system serves as the safety-related ultimate heat sink for the ESBWR design.

As discussed previously, the range of beyond-design-basis external events is unbounded. The MBDBE rule is not intended, and should not be understood, to mean that the mitigation strategies can adequately address all postulated beyond-design-basis external events. It is always possible to postulate a more severe event that causes greater damage and for which the mitigation strategies may not be able to maintain or restore the functional capabilities (*e.g.,* meteorite impact). Instead, the MBDBE requirements provide additional mitigation capability in light of uncertainties associated with external events, consistent with the NRC's regulatory objective for issuance of the Mitigation Strategies Order.

The MBDBE rule requires that the mitigating strategies for beyond-design-basis external events in § 50.155(b)(1) be capable of being implemented site-wide. This recognizes that severe external events are likely to impact the entire reactor site and for multi-unit sites, damage all the power reactor units on the site. This requirement means that there needs to be sufficient equipment and supporting staff to enable the maintenance or restoration of core cooling, containment, and SFP cooling functions for all the power reactor units on the site. This is a distinguishing characteristic of this set of mitigation strategies from those in § 50.155(b)(2), for which the damage state is a more limited, albeit large area of a single plant, reflecting the hazards for which that set of strategies was developed.

The NRC gave consideration to whether there should be changes made to § 50.63 (the Station Blackout Rule) to link those requirements with this rule. This consideration stemmed from recommendation 4.1 of the NTTF Report to ''initiate rulemaking to revise 10 CFR 50.63'' and the understanding that this rule could result in an increased SBO coping capability, in addition to the regulatory objectives of the MBDBE rule, which provide additional beyond-design-basis external event mitigation. Because of the substantive differences between the requirements of § 50.63 for licensees to be able to withstand and recover from an SBO and the MBDBE requirements, the NRC determined that such a linkage is not necessary and could lead to regulatory confusion.

The principal regulatory objective of § 50.63 was to establish SBO coping durations for a specific scenario: The loss of offsite power coincident with a failure of all trains of emergency onsite ac power (typically, the failure of multiple emergency diesel generators). In meeting this regulatory objective, the NRC understood that there would be safety benefits accrued through the provision of an alternate ac source diverse from the emergency diesel generators and therefore defined ''alternate ac source'' in § 50.2. The NRC defined the event a licensee must withstand and recover from as a ''station blackout'' rather than a ''loss of all ac power.'' An SBO allows for continued availability of ac power to buses fed by station batteries through inverters or by alternate ac sources. The MBDBE rule requires an additional capability to mitigate beyond-design-basis external events. Because the condition assumed for the mitigation strategies to establish the additional mitigation capability includes a loss of all ac power, which is more conservative than an SBO as defined in § 50.2 (because it covers an indefinite period, not a loss for a certain amount of time, and it also assumes the loss of alternate ac sources), there can be a direct relationship between the two different sets of requirements with regard to the actual implementation at the facility. Specifically, implementation of the mitigation strategies links into the SBO procedures (*e.g.,* the applicable strategies would be implemented to maintain or restore the key safety functions when the EOPs reach a ''response not obtained'' juncture).[4]

Step-by-step procedures are not necessary for many aspects of the mitigation strategies and guidelines. Rather, the strategies and guidelines are intended to be flexible, and enable plant personnel to adapt them to the conditions that result from the beyond-design-basis external event. The provisions typically would result in strategies and guidelines that use both installed and portable equipment, instead of only relying on installed ac power sources (with the exception of protected battery power) to maintain or restore core cooling, containment, and SFP cooling capabilities. By using equipment that is separate from the normal installed ac-powered equipment, the strategies and guidelines have a diverse attribute. By having available multiple sets of portable equipment that can be deployed and used in multiple ways depending on the circumstances of the event, operators are able to implement strategies and guidelines that are flexible and adaptable.

The mitigation strategies requirements are both performance-based and functionally-based. The performance-based requirements recognize that the new requirements provide most benefit to future reactors whose designs could differ significantly from current power reactor designs and as such, use of more prescriptive requirements could be problematic and create unnecessary regulatory impact and need for exemptions. Use of functionally-based requirements results from the need to have requirements that can address a wide range of damage states that might exist following beyond-design-basis external events. Maintaining or restoring three key functions (core cooling, containment, and SFP cooling) supports maintenance of the fission product barriers (*i.e.,* fuel clad, reactor coolant pressure boundary, and containment) and results in an effective means to mitigate these events, while remaining flexible such that the strategies and guidelines can be adapted to the damage state that occurs. Functionally-based requirements also result in strategies that align well with the symptom-based procedures used by power reactors to respond to accidents. Accordingly, the Mitigation Strategies Order contained requirements for a three-phased approach for current operating reactors. The MBDBE rule does not specify a number of phases; instead, it establishes higher-level, performance-based

[4] One of the formats for symptom-based EOPs that are used in the operating power reactors has the operators take an action and verify that the system responds to the action in a manner that confirms that the action was effective. For example, a step in an EOP could be to open a valve in order to allow cooling water flow, and the verification would be obtained by confirming there are indications that flow has commenced, such as a decrease in temperature of the system being cooled. If those indications are not obtained, the procedure would provide instructions on the next step to accomplish in a separate column labeled ''response not obtained.''

requirements consistent with this discussion. Section IV.K, ''Consideration of Explicit Requirements for a Three-Phase Response,'' of this document contains further discussion of this aspect of the MBDBE rule.

The NRC considered incorporating into this rule a requirement that licensees be capable of implementing the strategies and guidelines ''whenever there is irradiated fuel in the reactor vessel or spent fuel pool.'' This provision would have been a means of making generically applicable the requirement from the Mitigation Strategies Order that licensees be capable of implementing the strategies and guidelines ''in all modes.'' The NRC considered the terminology ''whenever there is irradiated fuel in the reactor vessel or spent fuel pool'' to be a better means to address the order requirement because the phrase did not use technical specification type language (*i.e.,* modes), which is in effect when a licensee completely offloads the fuel from the reactor vessel into the SFP during an outage. The NRC did not use the phrases, ''whenever there is irradiated fuel in the reactor vessel or spent fuel pool,'' or, ''in all modes,'' in the MBDBE rule and instead structured the applicability provisions to achieve this same objective by requiring licensees to have mitigation strategies for beyond-design-basis external events for the various configurations that can exist for the reactor and SFPs throughout the operational, refueling, and decommissioning phases.

The mitigation strategies and guidelines implemented under the Mitigation Strategies Order assume a demanding condition that maximizes decay heat that would need to be removed from the reactor core and SFP source terms on site. This implementation results in a more restrictive timeline (*i.e.,* mitigation actions required sooner to maintain or restore cooling to these source terms) and a greater resulting additional capability. These assumed at-power conditions are 100 days at 100 percent power prior to the occurrence of the beyond-design-basis event for the reactor core, consistent with the assumption used for § 50.63. This assumption establishes a conservative decay heat for the reactor source term. The assumed SFP conditions include the design basis heat load for the SFP, which is typically a full core offload following a refueling outage, as the heat load that is used for the sizing of FLEX equipment. For the purposes of determining the response time for the SFP strategies when fuel is in the reactor vessel, the rate of inventory loss of the SFP is calculated based on the worst case conditions for SFP heat load assuming the plant is at power. The NRC considers the development of timelines for the mitigation strategies using these assumptions for the reactor core and SFP to be appropriate.

The NRC recognizes the difficulty of developing engineered strategies for the extraordinarily large number of possible plant and equipment configurations that might exist under shutdown conditions (*i.e.,* at shutdown when equipment may be removed from service, when there is ongoing maintenance and repairs or refueling operations, or modifications are being implemented). Licensees must be cognizant of such configurations, equipment availability, and decay heat states that could present greater challenges under these conditions and design mitigation strategies that can be implemented under such circumstances.

The NRC considered incorporating requirements into the MBDBE rule that would require strategies to be developed that specifically assume that delays in the receipt of offsite resources occur as a result of damage to the transportation infrastructure. While severe events could damage local infrastructure, and could create challenges with regard to the delivery of offsite resources, the NRC concluded that having this level of specificity in the MBDBE rule is not necessary. Instead, this rule contains provisions that are more performance-based, requiring continued maintenance or restoration of the functional capabilities until acquisition of offsite assistance and resources. Potential delays and other challenges presented by extreme events that affect acquisition and use of offsite resources are addressed by licensee programs that implement the provisions of this rule.

The Mitigation Strategies Order included a requirement that licensees develop guidance and strategies to obtain ''sufficient offsite resources to sustain [the functions of core cooling, containment, and SFP cooling] indefinitely.'' The NRC considered using this language in this rule, but concluded that this would be better phrased as ''indefinitely, or until sufficient site functional capabilities can be maintained without the need for the mitigation strategies.'' The NRC concluded that this phrase more clearly communicates the existence of a transition from the use of the mitigation strategies to recovery operations.

EDMGs

In recognition of the similarity of the existing EDMGs formerly in § 50.54(hh)(2) to the strategies required by § 50.155(b)(1), the NRC relocated the EDMGs into the MBDBE rule as § 50.155(b)(2). In addition to moving the text, the NRC made a few editorial changes. The wording used to describe these requirements has evolved from ''guidance and strategies,'' in Order EA–02–026, ''Interim Safeguards and Security Compensatory Measures,'' dated February 25, 2002, to ''strategies,'' in the corresponding license conditions, to ''guidance and strategies,'' in § 50.54(hh)(2), to its current form, ''strategies and guidelines.'' The word ''guidelines'' was chosen rather than ''guidance'' to more accurately reflect the nature of the instructions that a licensee could develop and to avoid confusion with the term ''regulatory guidance.'' The word ''strategies'' is used in this rule to reflect its meaning, ''plans of action.'' The resulting plans of action may include plant procedures, methods, or other guideline documents, as deemed appropriate by the licensee during the development of these strategies. These plans of action also include the arrangements made with offsite responders for support during an actual event. No substantive change to the requirements is intended by this change in the wording.

The final rule clarifies the § 50.155(b)(2) requirements by adding the phrase ''impacted by the event'' in order to differentiate these requirements from those located in § 50.155(b)(1). The requirements in § 50.155(b)(2), which address the loss of large areas of the plant, are limited to the areas of the plant impacted by the event, and as such, are not intended to address a site-wide event. This clarification was necessary as a result of the relocation of these requirements to the MBDBE rule and their juxtaposition with the mitigation strategies for beyond-design-basis external events in § 50.155(b)(1), which are for a site-wide event. The events for which EDMGs would be used can impact key equipment that is shared between power reactor units (*i.e.,* SFPs), and that is why the NRC did not use language that would have limited the application of these requirements to an individual power reactor unit. This clarification is to preserve the scope of this requirement and specifically avoid an unintended imposition of a new requirement.

Applicability of the requirements of § 50.155(b)(2) was formerly governed by § 50.54(hh)(3), which made these requirements inapplicable following the submittal of the certifications required under § 50.82(a) or § 52.110(a)(1). As discussed in the Power Reactor Security Requirements final rule, the NRC concludes that it is inappropriate for the requirements for EDMGs to apply to a

permanently shutdown, defueled reactor, where the fuel was removed from the site or moved to an ISFSI. The NRC is requiring EDMGs for a licensee with permanently shutdown defueled reactors, but with irradiated fuel still in its SFP, because the licensee must be able to implement effective mitigation measures for large fires and explosions that could impact the SFP while it contains irradiated fuel. The MBDBE rule corrects the former § 50.54(hh)(3) to implement the sunsetting of the associated requirement as intended by the Commission in 2009. This change does not constitute backfitting for currently operating reactors (except Watts Bar Nuclear Plant, Unit 2), current COL holders, and currently decommissioning reactors with spent irradiated fuel in their SFP (except Millstone Power Station, Unit 1, as it is not subject to § 50.155) because the EDMGs are also required by the licensee's license conditions. Watts Bar Nuclear Plant, Unit 2, does not have the license condition, but TVA has consented to the imposition of this requirement without the NRC conducting a backfit analysis for this imposition on Watts Bar Nuclear Plant, Unit 2. The NRC request for TVA's consent and TVA's response are referenced in Section XIX, ''Availability of Documents,'' of this document.

In the proposed MBDBE rule, the NRC discussed secondary containment aspects of the mitigation strategies in the decommissioning provisions of § 50.155(a) for licensees that rely on secondary containment as a fission product barrier for their SFPs. The intent of the proposed requirement was to document the requirement without changing the requirements that had been imposed under the Mitigation Strategies Order and § 50.54(hh)(2). In the course of interactions with the ACRS and during the CER meeting, the NRC received feedback that this phrasing of the requirement was confusing. Therefore, the NRC has revised the final MBDBE rule to eliminate the discussion of secondary containment in the decommissioning provisions of § 50.155(a).

Equipment

The MBDBE rule contains requirements for licensee equipment that is relied upon for use in mitigation strategies and guidelines. This final rule makes generically applicable requirement (2) in attachments 2 and 3 of the Mitigation Strategies Order, which reads as follows: ''These strategies must . . . have adequate capacity to address challenges to core cooling, containment, and SFP cooling capabilities at all units on a site subject to this Order.''

The industry guidance of NEI 12–06, as endorsed by NRC interim staff guidance JLD–ISG–2012–01, included specifications for each licensee's provision of a spare capability in order to assure the reliability and availability of the equipment required to provide the capacity and capability requirements of the Mitigation Strategies Order. This ''spare capability'' was also referred to within the guidance as an ''N+1'' capability, where ''N'' is the number of power reactor units on a site. The NRC considered including requirements similar to the spare capability specification of NEI 12–06 in this rule but determined that such an inclusion would be too prescriptive and could result in the need to grant exemptions for alternate approaches that provide an effective and efficient means to provide the required capability. One example of this is in the area of flexible hoses, for which a strict application of the spare capability guidance could necessitate a licensee's provision of spare hose or cable lengths sufficient to replace the longest run of hoses being used by the licensee, when significant operating experience with similar hoses for fire protection does not show a failure rate that would support the need for such a spare capability.

The development of the mitigation strategies in response to the Mitigation Strategies Order relied upon a variety of initial and boundary conditions that were provided in the regulatory guidance of JLD–ISG–2012–01 and NEI 12–06. These initial and boundary conditions followed the philosophy of the basis for imposition of the requirements of the Mitigation Strategies Order, which was to require additional defense-in-depth measures to provide continued reasonable assurance of adequate protection of public health and safety. As a result, the industry response to the Mitigation Strategies Order includes diverse and flexible means of accomplishing safety functions rather than providing an additional further hardened train of safety equipment. These requirements and conditions included the acknowledgement that, due to the fact that initiation of an event requiring use of the strategies would include multiple failures of safety-related SSCs, it is inappropriate to postulate further failures that are not consequential to the initiating event. As a result, the NRC has determined that the conditions to which the instrumentation (as a class of equipment), that would be relied on for the mitigation strategies, would be exposed do not include conditions stemming from fuel damage. Instead, those conditions are limited to the initial and boundary conditions set forth in the guidance and include the conditions assumed to result from a postulated beyond-design-basis external event used in developing the guidelines and strategies under the MBDBE rule. The NRC has determined that it should not be necessary for the instrumentation to be designed specifically for use in the mitigation strategies and guidelines, but instead it would be necessary that the design and associated functional performance be sufficient to meet the demands of those strategies (*i.e.,* a licensee may rely upon existing instrumentation that is capable of operating in the conditions anticipated for the required strategies and guidelines rather than replacing it with new instrumentation specifically designed for those conditions). For example, NEI 12–06, which is endorsed in RG 1.226, includes a discussion in section 3.2.1.12 regarding the basis that should be provided for plant equipment that is relied upon in the mitigation strategies.

The MBDBE requirements cover events that are not included in design-basis events as that term is used in the § 50.2 definition of ''safety-related structures, systems, and components.'' Because of this, reliance on equipment for use in the mitigation strategies does not result in the applicability of the PDC as described in GDC 2 of appendix A to 10 CFR part 50. The MBDBE rule requires reasonable protection for the equipment relied on for the mitigation strategies against the effects of natural phenomena that are equivalent in magnitude to the phenomena assumed for developing the design basis for the facility.

Because the events for which the mitigation strategies are to be used are outside the scope of the design-basis events considered in establishing the basis for the design of the facility, equipment that is relied upon solely for those mitigation strategies does not fall within the scope of § 50.65 (the Maintenance Rule). Nevertheless, the equipment used to implement the mitigation strategies must receive adequate maintenance in order to assure that it is capable of fulfilling its intended function, and thereby ensure that the requirement to develop, implement, and maintain the mitigation strategies continues to be met.

This rulemaking does not revise the regulatory treatment of equipment relied upon for the EDMGs now relocated to § 50.155(b)(2). The regulatory treatment of that equipment remains as it is described in NEI 06–12, the endorsed

guidance document for those strategies and guidelines.

The NRC recognizes that existing nuclear power reactors with operating licenses issued under 10 CFR part 50 and those new nuclear power reactors with COLs issued under 10 CFR part 52 or operating licenses issued under 10 CFR part 50 may establish different approaches in developing strategies to mitigate beyond-design-basis events. For example, new nuclear power plants may use installed plant equipment for both the initial and long-term response to a loss of all ac power with less reliance on offsite resources than existing nuclear power reactors. Under § 50.155(c), the NRC will consider the specific plant approach when evaluating the SSCs relied on as part of the mitigation strategies for beyond-design-basis events.

Training

The mitigation of the effects of beyond-design-basis events using the strategies and guidelines is principally accomplished through manual actions rather than automated plant responses. Additionally, the instructions provided for event mitigation may be largely provided as high level strategies and guidelines rather than step-by-step procedures. The use of strategies and guidelines supports the ability to adapt the mitigation measures to the specific plant damage and operational conditions presented by the event. However, effective use of this flexibility depends upon the knowledge and abilities of personnel to select appropriate strategies or guidelines from a range of options and implement mitigation measures using equipment or methods that may differ from those employed for normal operation or design-basis event response. As a result, the NRC considers personnel training necessary to ensure that individuals are capable of effectively performing the roles and responsibilities established in the strategies and guidelines that are required by this rule.

Spent Fuel Pool Monitoring

The MBDBE rule requires licensees to have a means to remotely monitor wide-range SFP level as a separate requirement within the MBDBE rule, which makes the requirements of the SFPI Order generically applicable. While many licensees make use of this instrumentation to support implementation of the mitigation strategies, the instrumentation requirement was imposed under the SFPI Order to address the potential for the licensee personnel to be distracted from other issues by the status of the SFP and thereby enable the operators to re-prioritize resources, if necessary, following a beyond-design-basis external event. This requirement has a separate purpose from the mitigation strategies requirements: To provide a reliable indication of the water level in the SFP to allow prioritization of response actions between the core and the SFP. Therefore, this requirement was moved to paragraph (e) in the final rule to ensure a continued separation of the requirements. The NRC considered including the detailed requirements from the SFPI Order within the MBDBE rule but determined that the more performance-based approach taken with this rule allows an applicant for a new reactor license or design certification to provide innovative solutions to address the need to effectively prioritize event mitigation and recovery actions between the source term contained in the reactor vessel and that contained within the SFP.

In the course of implementation of the SFPI Order requirements, one lesson learned was that the need for prioritization of event mitigation and recovery actions is inapplicable to SFPs for which the decay heat load is sufficiently low that SFP cooling is not challenged in the same time frame as event progression for the reactor core. This was documented in the regulatory guidance of JLD–ISG–2012–03 and NEI 12–02, ''Industry Guidance for Compliance with NRC Order EA–12–051, 'To Modify License with Regard to Reliable Spent Fuel Pool Instrumentation,' '' Revision 1, which eliminates from the definition of an applicable SFP a pool that does not contain fuel used for the generation of power within the preceding 5 years. This is clarified in the MBDBE rule in § 50.155(e) by including a termination of the requirement once 5 years have elapsed since the fuel within the pool was last used for power generation in a reactor vessel.

Documentation of Changes

Because the MBDBE rule requirements address beyond-design-basis events, currently existing change control processes, including most notably § 50.59, may not address all aspects of a contemplated change to the strategies and guidelines under this rule. Therefore, the MBDBE rule includes a provision intended to supplement the existing change control processes and focus on the beyond-design-basis aspects of proposed changes. The MBDBE rule does not contain criteria typically included in other change control processes that are used as a threshold for determining when a licensee needs to seek NRC review and approval prior to implementing the proposed change. Instead, the MBDBE rule requires that licensees perform evaluations of proposed changes sufficient to reach a conclusion that the MBDBE rule requirements continue to be met and to document and maintain this evaluation to support NRC oversight of these activities. The final rule is revised to more clearly reflect this approach by referring to these requirements in § 50.155(f) as ''Documentation of Changes.''

The NRC requested stakeholder feedback concerning the change control provisions for the MBDBE rule. The feedback provided is discussed in Section IV of this document. The NRC concludes that the final rule will follow the same approach contained in the proposed rule as discussed in Section VI of this document. Notwithstanding this conclusion, the NRC is revising the discussion in this document for this provision to clarify its meaning and intent.

The NRC determined that the changes whose acceptability would be most difficult to judge are those that do not fall within endorsed guidance or are not NRC-approved alternative approaches taken at another licensed facility that can be demonstrated to apply to the licensee's facility. Changes to the implementation of the MBDBE requirements that remain consistent with regulatory guidance are clearly acceptable because such changes ensure continued compliance with the MBDBE requirements. The NRC recognizes that licensees may wish to make changes to the implementation of these requirements that do not follow current regulatory guidance for this rulemaking and that are not an approved alternative that the licensee can demonstrate applies to their facility. To clarify the MBDBE rule requirements for documentation of changes, the NRC added additional information to Section VI of this document that discusses potential changes, which are outside endorsed guidance or approved alternatives, that would clearly not constitute ''demonstrated compliance.''

During public discussions before issuance of the proposed rule, a stakeholder suggested that the NRC should consider a provision to allow a licensee to request NRC review of a proposed change, and that if the NRC did not act upon the request for a suggested time period (*e.g.,* 180 days), then the request would be considered ''acceptable,'' similar to the process for changes to the quality assurance program description under

§ 50.54(a)(4)(iv). The NRC did not include this form of tacit approval process in the MBDBE rule and instead included provisions in the MBDBE rule to place on licensees the responsibility for ensuring that proposed changes result in continued compliance with the rule, subject to NRC oversight, or are otherwise submitted to the NRC under the § 50.12 exemption process.

A licensee may intend to change its facility, procedures, or guideline sets to revise some aspect of beyond-design-basis mitigation governed by the MBDBE rule in a manner that can impact multiple aspects of the facility, including ''design basis'' aspects of the facility subject to other regulations and change control processes. As previously discussed, the NRC anticipates that licensees will ensure that changes to the implementation of the MBDBE requirements are consistent with endorsed guidance, or otherwise demonstrate continued compliance with the MBDBE rule. This same change also could impact safety-related SSCs, either directly (*e.g.,* a proposed change that impacts a physical connection of mitigation strategies equipment to a safety-related component or system) or indirectly (*e.g.,* a proposed change that involves the physical location of mitigation equipment in the vicinity of safety-related equipment that presents a potential for adverse physical/spatial interactions with safety-related components). As a result, § 50.59 and other change control processes, as appropriate, would need to be applied to evaluate the proposed change for acceptability under any other applicable change control process.

Additionally, proposed changes can impact numerous aspects of the facility beyond the safety-related impacts, including implementation of fire protection requirements, security requirements, emergency preparedness requirements, or safety/security interface requirements. A licensee must therefore ensure that all applicable change control provisions are used to judge the acceptability of facility changes. Additionally, recognizing the nature of mitigation strategies and the reliance on human actions, a licensee also needs to ensure that the proposed changes satisfy the safety/security interface requirements of § 73.58. While the obligation of a licensee to comply with all applicable requirements might be viewed as making the provision in § 50.155(f)(2) unnecessary, the NRC recognizes the potential complexity of proposed facility changes and the complexity of existing regulatory requirements that govern change control. Therefore, the NRC concluded that adding the § 50.155(f)(2) provision for documentation of changes was warranted for the purposes of regulatory clarity.

Implementation

Section 50.155(g) provides a 2-year implementation period to provide sufficient time to allow licensees to review their previous compliance with the Mitigation Strategies and SFPI Orders and make any necessary changes to programs, plans, procedures, and guidelines to reflect and reference the newly issued § 50.155 requirements. This implementation period is 3 years for licensees that received Order EA–13–109. These licensees are allowed an additional year of implementation in order to alleviate CER by allowing the same amount of time following achievement of full compliance with that order, which was issued a year after the Mitigation Strategies and SFPI Orders.

In contrast with the portions of the final MBDBE rule that make the Mitigation Strategies and SFPI Orders generically applicable, § 50.155(b)(2) continues the requirements that were previously in § 50.54(hh)(2). Currently operating power reactor licensees have all achieved compliance with these requirements. Therefore, § 50.155(g) requires that licensees subject to the requirements of § 50.155(b)(2) continue to comply with those requirements during the implementation period for the remainder of the final MBDBE rule.

Order Withdrawal and Removal of License Conditions

The NRC is including in the final rule specific terms that withdraw orders and remove license conditions that are substantively redundant with provisions in the final rule. As discussed in this section, a primary objective of this rulemaking is to make the requirements of the Mitigation Strategies and SFPI Orders generically applicable to power reactor licensees and applicants, taking into account lessons learned in the orders' implementation and stakeholder feedback received through the regulatory process. As such, the requirements of § 50.155 fully replace the requirements of those orders. Although the orders provide for their relaxation or rescission on a licensee-specific basis, use of that process would be an inefficient and unnecessary administrative burden on licensees and the NRC—with no impact on public health and safety—because the final rule simultaneously replaces the orders in their entirety for all applicable licensees. Therefore, the NRC finds that good cause is shown to withdraw the Mitigation Strategies and SFPI Orders for all licensees that received those orders once the MBDBE rule goes into effect and licensees are in compliance with it. The withdrawal date for these orders was set to be the latest date for compliance by licensees in receipt of the orders to prevent a regulatory gap.

The NRC is also removing certain license conditions contained within the COLs held by Detroit Edison Company (for Enrico Fermi Nuclear Plant, Unit 3), Duke Energy Carolinas, LLC (for William States Lee III Nuclear Station, Units 1 and 2), Dominion Virginia Power (for North Anna Unit 3) and Florida Power and Light Company (for Turkey Point, Units 6 and 7). These licensees did not receive the Mitigation Strategies and SFPI Orders because the NRC had not issued COLs to these licensees at the time the NRC issued the Orders. When the NRC issued those COLs, it included license conditions that are equivalent to the orders' requirements. Because the license conditions contain the same requirements as the orders, and the provisions of § 50.155 replace the requirements imposed by the orders, the license conditions contain requirements equivalent to § 50.155 and will not be necessary once the MBDBE rule goes into effect. Therefore, the mitigation strategies for beyond-design-basis external events license conditions will be deemed removed from the Enrico Fermi Nuclear Plant, Unit 3, William States Lee III Nuclear Station, Units 1 and 2, North Anna Unit 3, and Turkey Point, Units 6 and 7 COLs on September 9, 2019.

In addition to license conditions corresponding to the Mitigation Strategies Orders, the COLs for Enrico Fermi Nuclear Plant, Unit 3, William States Lee III Nuclear Station, Units 1 and 2, North Anna Unit 3, and Turkey Point, Units 6 and 7 included license conditions for the performance of staffing and communications assessments that correspond to the requests for information on those subjects in the NRC letter issued under § 50.54(f) on March 12, 2012. As discussed in COMSECY–13–0010, ''Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned,'' with regard to the interaction between licensee response to the § 50.54(f) letter and compliance with the Mitigation Strategies Order, ''the implementation of NEI 12–06 has a dependency on NEI 12–01, 'Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities,' which was developed to address Tier 1 NTTF 9.3 Recommendation regarding staffing

and communications. NEI 12–06 will utilize the staffing and communication resources identified in NEI 12–01.'' Because the implementation of the final rule uses the same guidance as an acceptable means of compliance, there is no longer a need to collect this information for these licensees because there will be no additional regulatory action taken to modify, suspend, or revoke their licenses and the licensees are obligated to instead comply with the new requirements. Therefore, the license conditions calling for staffing and communications assessments for these licensees will be deemed removed on September 9, 2019.

Because the final rule removes certain license conditions without actually amending the associated licenses, the NRC will issue by letter an administrative license amendment to each applicable licensee that will remove the relevant license condition(s) from that licensee's license and include revised license pages.

For each of these orders being withdrawn and license conditions being removed, the NRC is replacing it with equivalent requirements in the MBDBE rule. Although the NRC did not include these measures in the MBDBE proposed rule, the NRC provided sufficient notice and an opportunity to comment under the Administrative Procedure Act (5 U.S.C. 553(b)) when it issued the MBDBE proposed rule. In the proposed rule, the Commission explained that the NRC would make generically applicable certain requirements in the Mitigation Strategies and SFPI Orders and related license conditions. The Commission's decision to remove these license conditions now that they are unnecessary was reasonably foreseeable, just as it was foreseeable that the Commission would withdraw the orders. Additionally, the Commission was informed by comments from the public that warned of potential unintended consequences from having duplicate requirements in orders, license conditions, and regulations. Thus, this aspect of the final rule, like the rest of the final rule, is a logical outgrowth of the proposed rule. Under the logical outgrowth line of legal decisions (*e.g., Long Island Care at Home, Ltd.* v. *Coke,* 551 U.S. 158 (2007); *National Mining Ass'n* v. *Mine Safety and Health Administration,* 512 F.3d 696 (D.C. Cir. 2008)), the public had adequate notice and opportunity to comment on the withdrawal of orders and removal of license conditions.

Technology-Neutral Emergency Response Data System

The requirements of section VI of appendix E to 10 CFR part 50, for the ERDS are amended to reflect the use of up-to-date technologies and remain technology-neutral so that the equipment supplied by the NRC continues to be replaced as needed, without the need for future rulemaking as equipment becomes obsolete. In 2005, the NRC initiated a comprehensive, multi-year effort to modernize aspects of the ERDS, including the hardware and software that constitute the ERDS infrastructure at NRC headquarters, as well as the technology used to transmit data from licensed power reactor facilities. As described in NRC Regulatory Issue Summary 2009–13, ''Emergency Response Data System Upgrade from Modem to Virtual Private Network Appliance,'' the NRC engaged licensees in a program that replaced the existing modems used to transmit ERDS data with virtual private network devices. The licensees now have less burdensome testing requirements, faster data transmission rates, and increased system security.

VI. Section-by-Section Analysis

§ 50.8 Information Collection Requirements: OMB Approval

This section, which lists all information collections in 10 CFR part 50 that have been approved by the Office of Management and Budget (OMB), is revised by adding a reference to § 50.155, the MBDBE rule. As discussed in Section XIV, ''Paperwork Reduction Act,'' of this document, the OMB has approved the information collection and reporting requirements in the MBDBE rule. No specific requirement or prohibition is imposed on applicants or licensees in this section.

§ 50.34 Contents of Applications; Technical Information

Section 50.34 identifies the technical information that must be provided in applications for construction permits and operating licenses. Paragraphs (a) and (b) of this section identify the information to be submitted as part of the preliminary or final safety analysis report, respectively. Revised paragraph (i) of this section identifies information to be submitted as part of an operating license application but not necessarily included in the final safety analysis report.

The NRC is making an administrative change to § 50.34(a)(13) and (b)(12) to remove the word ''stationary'' from the requirement for power reactor applicants who apply for a construction permit or operating license, respectively. Section 50.34(a)(13) and 50.34(b)(12) were added to the regulations in 2009 to reflect the requirements of § 50.150(b) regarding the inclusion of information within the preliminary or final safety analysis reports for applicants subject to § 50.150. Section 50.34(a)(13) and (b)(12) were inadvertently limited to ''stationary power reactors,'' matching the wording of § 50.34(a)(1), (a)(12), (b)(10), and (b)(11), which pertain to seismic risk hazards for stationary power reactors. The NRC is not changing the meaning of this requirement by removing the word ''stationary'' from these requirements. This change is to ensure consistency in describing the types of applications to which the requirements apply.

Section 50.34(i) requires each application for an operating license to include the applicant's plans for implementing the requirements of § 50.155 including a schedule for achieving full compliance with these requirements. This paragraph also requires the application to include a description of the equipment upon which the strategies and guidelines required by § 50.155(b)(1) rely, including the planned locations of the equipment and how the equipment and SSCs would meet the design requirements of § 50.155(c).

§ 50.54 Conditions of Licenses

This rulemaking redesignates § 50.54(hh)(3) as § 50.54(hh)(2) to reflect the movement of the requirements formerly in § 50.54(hh)(2) to § 50.155(b)(2). Section 50.54(hh)(2) is revised to reflect that § 50.54(hh)(1) applies to the licensee rather than the facility and to correct the section numbers for the required certifications. To avoid an unnecessary backfit in § 50.54(hh)(2), in the final rule the NRC removed the words ''once the NRC has docketed those certifications'' from the proposed § 50.54(hh)(2).

§ 50.155 Mitigation of Beyond-Design-Basis Events

This final rule adds new § 50.155, ''Mitigation of beyond-design-basis events,'' to 10 CFR part 50. The details of each paragraph within § 50.155 are explained in greater detail in the following paragraphs in this section.

Paragraph (a), ''Applicability''

Paragraph (a) describes which entities are subject to the MBDBE rule. Paragraph (a)(1) provides that each holder of an operating license for a

nuclear power reactor under 10 CFR part 50, as well as each holder of a COL under 10 CFR part 52 for which the Commission has made the finding under § 52.103(g) that the acceptance criteria are met, is required to comply with the requirements of this rule until the time when the NRC has docketed the certifications described in § 50.82(a)(1) or § 52.110(a). These certifications inform the NRC that the licensee has permanently ceased to operate the reactor and permanently removed all fuel from the reactor vessel. The permanent removal of fuel from the reactor vessel removes the possibility of core damage and containment failure, making it appropriate to terminate the requirements for strategies and guidelines to maintain or restore core cooling and containment capabilities. At the time the licensee submits these certifications, control of the applicability of the requirements of § 50.155 for licensees transitions to § 50.155(a)(2).

Although neither an applicant for an operating license under 10 CFR part 50 nor a COL holder before the § 52.103(g) finding is required to comply with § 50.155 until issuance of the operating license or the § 52.103(g) finding, respectively, these entities must include in their applications information under § 50.34(i) or § 52.80(d), respectively, including a schedule for achieving full compliance with the requirements of § 50.155.

Paragraph (a)(2) addresses power reactor licensees that permanently stop operating and defuel their reactors and begin decommissioning the reactors. Paragraph (a)(2)(i) provides that when an entity subject to the requirements of § 50.155 submits to the NRC the certifications described in § 50.82(a)(1) or § 52.110(a), then that licensee is required to comply only with the requirements of § 50.155(b) through (d), and (f) associated with maintaining or restoring SFP cooling capabilities for the reactor described in the § 50.82(a)(1) or § 52.110(a) certifications. In other words, the licensee may discontinue compliance with the requirements in § 50.155 associated with maintaining or restoring core cooling or the containment capability for the reactor described in the § 50.82(a)(1) or § 52.110(a) certifications. Compliance with the requirements of § 50.155(b) through (d), and (f) associated with maintaining or restoring SFP cooling capabilities continues as long as spent fuel remains in the SFPs associated with the reactor described in the § 50.82(a)(1) or § 52.110(a) certifications, or until the criterion of § 50.155(a)(2)(ii) can be satisfied. Once those conditions are satisfied, control of the applicability of the requirements of § 50.155 for licensees transitions to paragraphs (a)(2)(iv) or (a)(2)(ii), respectively.

Paragraph (a)(2)(ii) discontinues all the requirements of § 50.155 except those provided in § 50.155(b)(2) once the decay heat of the fuel in the SFP can be removed solely by heating and boiling of water within the SFP and the boil-off period provides sufficient time for the licensee to obtain off-site resources to sustain the SFP cooling function indefinitely. To comply with the requirement of § 50.155(a)(2)(ii), licensees must perform and retain an analysis demonstrating that sufficient time has passed since the fuel within the SFP was last irradiated such that the fuel's low decay heat and boil-off period provide sufficient time in an emergency for the licensee to obtain off-site resources to sustain the SFP cooling function indefinitely.

Paragraph (a)(2)(iii) exempts the licensee for Millstone Power Station, Unit 1, Dominion Nuclear Connecticut, Inc. from the requirements of § 50.155.

Paragraph (a)(2)(iv) allows holders of operating licenses or COLs for which the certifications described in § 50.82(a)(1) or § 52.110(a) have been submitted to cease compliance with all requirements in § 50.155, once a power reactor licensee has permanently stopped operating, defueled its reactor, and removed all irradiated fuel from the SFP(s) associated with the reactor described in the § 50.82(a)(1) or § 52.110(a) certifications.

Paragraph (b), ''Strategies and Guidelines''

Paragraph (b) requires that each applicant or licensee develop, implement, and maintain mitigation strategies for beyond-design-basis external events and EDMGs. The intent of this requirement is that the operating license and COL holders described in § 50.155(a) be able to mitigate the consequences of a wide range of initiating beyond-design-basis events and plant damage states that can challenge public health and safety.

Paragraph (b) specifies that the mitigation strategies for beyond-design-basis external events and EDMGs be ''developed, implemented, and maintained.'' The term ''implement'' is used in § 50.155(b) to mean that the mitigation strategies for beyond-design-basis external events and EDMGs are established and available to respond, if needed (*e.g.,* the licensee has approved the strategies, guidelines, and procedures for use). The term ''maintain'' as used in § 50.155(b) reflects the NRC's intent that licensees ensure that the mitigation strategies for beyond-design-basis external events and EDMGs, once established, be preserved, including the need to maintain equipment relied on for the mitigation strategies such that the equipment is capable of fulfilling its intended function, and consistent with the provisions for documentation of changes in § 50.155(f).

Paragraph (b)(1) requires applicants and licensees to develop, implement and maintain strategies and guidelines to mitigate beyond-design-basis external events from natural phenomena. These strategies and guidelines are developed assuming a loss of all ac power concurrent with either an LUHS or, for passive reactor designs, a loss of normal access to the normal heat sink. These provisions require that the strategies and guidelines be capable of being implemented site-wide and include the following:

i. Maintaining or restoring core cooling, containment, and SFP 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 SFP cooling indefinitely, or until sufficient site functional capabilities can be maintained without the need for the mitigation strategies.

New reactors may establish different approaches from those of operating reactors in developing strategies to mitigate beyond-design-basis events. For example, new reactors may use installed plant equipment for both the initial and long-term response to a loss of all ac power with less reliance on portable equipment and offsite resources than currently operating nuclear power plants. The NRC would consider the specific plant approach when evaluating the SSCs relied on as part of the mitigation strategies for beyond-design-basis events. Additional information on these strategies is provided in RG 1.226, which endorses an updated version of the industry guidance, for use by applicants and licensees, that incorporates lessons learned and feedback stemming from the implementation of the Mitigation Strategies Order, consistent with Commission direction.

Paragraph (b)(1) limits the requirements for mitigation strategies to addressing ''external events from natural phenomena.'' This language is meant to differentiate these requirements from those that previously existed in § 50.54(hh)(2) that are now located in § 50.155(b)(2), and which address beyond-design-basis external

events leading to loss of large areas of the plant due to explosions and fire.

The requirement to enable ''the acquisition and use of offsite assistance and resources to support the functions required by § 50.155(b)(1)(i) of this section indefinitely, or until sufficient site functional capabilities can be maintained without the need for the mitigation strategies'' means that licensees need to plan for obtaining sufficient resources (*e.g.,* fuel for generators and pumps, cooling and makeup water) to continue removing decay heat from the irradiated fuel in the reactor vessel and SFP as well as to remove heat from containment as necessary until an alternate means of removing heat is established. The alternate means of removing heat could be achieved through repairs to existing SSCs, commissioning of new SSCs, or reduction of decay heat levels through the passage of time sufficient to allow heat removal through losses to the ambient environment. More detailed planning for offsite assistance and resources is necessary for the initial period following the event; less detailed planning is necessary as the event progresses and the licensee can mobilize additional support for recovery.

Paragraph (b)(2) contains the requirements for EDMGs that previously existed in § 50.54(hh)(2) and are described in the Power Reactor Security Requirements final rule. The movement of these requirements consolidates the requirements for beyond-design-basis strategies and guidance into a single section to promote efficiency in their consideration and allow for better integration. Although the wording of § 50.155(b)(2) differs from that of previous § 50.54(hh)(2), no substantive change in the requirements is intended.

The introductory text of § 50.155(b)(2) that is contained in § 50.155(b) is worded so that it requires that licensees ''develop, implement, and maintain'' the strategies and guidance required in § 50.155(b)(2) rather than using the wording of previous § 50.54(hh)(2) to require that licensees ''develop and implement'' the described guidance and strategies. The addition of the word ''maintain'' is to correct an inconsistency with the wording of § 50.54(hh)(1), which was issued along with § 50.54(hh)(2) in the Power Reactor Security Requirements final rule. The requirement as it was originally issued in Order EA–02–026 was worded to require licensees to ''develop'' specific guidance, while the corresponding license conditions imposed by the conforming license amendment was worded to require each affected licensee to ''develop and maintain'' strategies. The NRC concludes that the phrase ''develop, implement, and maintain'' provides better clarity of what is necessary for compliance with the requirements without substantively changing the requirements.

Paragraph (c), ''Equipment''

Paragraph (c)(1) requires that equipment relied on for the mitigation strategies and guidelines of § 50.155(b)(1) must have sufficient capacity and capability to perform the functions required by § 50.155(b)(1).

The phrase ''sufficient capacity and capability'' in § 50.155(c)(1) means that the equipment, and the instrumentation relied on to support the decision making necessary to accomplish the associated mitigation strategies of § 50.155(b)(1), has the design specifications necessary to assure that it functions and provides the requisite information on plant status when subjected to the conditions it is expected to be exposed to in the course of the execution of those mitigation strategies. These design specifications include appropriate consideration of environmental conditions that are predicted in the thermal-hydraulic and room heat up analyses used in the development of the mitigation strategies required by § 50.155(b)(1).

Paragraph (c)(2) requires reasonable protection of the equipment in § 50.155(b)(1) from the effects of natural phenomena that are equivalent in magnitude to the phenomena assumed for developing the external design basis of the facility. ''Reasonable protection'' is the means by which the NRC applies the appropriate level of treatment to equipment and SSCs that are required to function for § 50.155, without regard to whether the equipment is ''FLEX equipment,'' as defined in NEI 12–06, or ''plant equipment,'' as that term is used in NEI 12–06. Safety-related SSCs that function initially in response to beyond-design-basis external events have two sets of functions: Safety-related functions and beyond-design-basis functions. The requirements placed on these SSCs to perform their safety-related functions for the design-basis events are extensive and are intended to result in an increased level of assurance that the SSCs will perform those safety-related functions, during and/or following the design-basis events as applicable.

For these dual-function SSCs, the regulatory requirements and resulting level of regulatory assurance for the beyond-design-basis functions addressed by § 50.155(b)(1) for these dual-function SSCs are intended to be less stringent than the requirements associated with their safety-related functions. The ''reasonable protection'' requirement is the means for applying a reduced level of treatment for the beyond-design-basis functions and establishes an appropriate level of assurance. The phrase ''reasonable protection'' was initially proposed in recommendation 4.2 of the NTTF Report in the context of a recommendation for the NRC to issue an order to licensees to provide ''reasonable protection'' of equipment required by the former § 50.54(hh)(2) from the effects of design-basis external events along with providing additional sets of equipment as an interim measure during a subsequent rulemaking on prolonged SBO. The NTTF based this recommendation on the potential usefulness of the EDMGs in circumstances that do not involve the loss of a large area of the plant and explained that reasonable protection from external events as used in the NTTF Report meant that the equipment must ''be stored in existing locations that are reasonably protected from significant floods and involve robust structures with enhanced protection from seismic and wind-related events.''

The NRC carried forward the use of the phrase ''reasonable protection'' in the Mitigation Strategies Order with regard to the protection required for equipment associated with the mitigation strategies. That order did not, however, define ''reasonable protection.'' The NRC guidance in JLD–ISG–2012–01, Revision 0, discussed ''reasonable protection'' as follows:

> Storage locations chosen for the equipment must provide protection from external events as necessary to allow the equipment to perform its function without loss of capability. In addition, the licensee must provide a means to bring the equipment to the connection point under those conditions in time to initiate the strategy prior to expiration of the estimated capability to maintain core and spent fuel pool cooling and containment functions in the initial response phase.

In JLD–ISG–2012–01, Revision 0, the NRC endorsed NEI 12–06, Revision 0, as providing an acceptable method to provide reasonable protection, storage, and deployment of the equipment associated with the Mitigation Strategies Order. NEI 12–06, Revision 0, also omitted a definition for the phrase ''reasonable protection,'' but did provide guidelines for licensees for protecting the equipment from the hazards that would be commonly applicable: (1) Seismic hazards; (2) flooding hazards; (3) severe storms with high winds; (4) snow, ice and extreme cold; and (5) high temperatures. Later revisions to the guidance for the

Mitigation Strategies Order included further discussions on reasonable protection. NEI 12–06, Revision 2, defined reasonable protection as ''[s]toring on-site FLEX equipment in configurations such that no one external event can reasonably fail the site FLEX capability (N) when the required FLEX equipment is available.'' The JLD–ISG–2012–01, Revision 1, endorsed the approach of NEI 12–06, Revision 2, as an acceptable method of providing reasonable protection to the equipment associated with the strategies and guidelines developed under the Mitigation Strategies Order, clarifying that the elements of the approach that should be addressed are the following:

—Identification of the natural phenomena for which reasonable protection is necessary,
—determination of the method of protection to be used,
—establishment of controls on unavailability of the equipment, and
—provision of a method of transporting the portable equipment from its storage location to the site in which it will be used.

The RG 1.226 carries forward this guidance on reasonable protection, endorsing the current version of NEI 12–06 as providing an acceptable method of complying with § 50.155(c)(2).

The guidance of RG 1.226 and NEI 12–06 includes the use of structures designed to, or evaluated as equivalent to, American Society for Civil Engineers Standard 7–10, ''Minimum Design Loads for Buildings and Other Structures,'' for the seismic and high winds hazards, rather than requiring the use of a structure that meets the plant's design basis for the safe shutdown earthquake or high winds hazards including missiles. The NEI 12–06 guidelines also allow storage of the equipment above the flood elevation from the most recent site flood analysis, storage within a structure designed to protect the equipment from the flood, or storage below the flood level if sufficient time would be available and plant procedures would address the need to relocate the equipment above the flood level based on the timing of the limiting flood scenario(s). The NEI 12–06 guidelines further provide that multiple sets of equipment may be stored in diverse locations in order to provide assurance that sufficient equipment could be deployed to assure the success of the strategies following an initiating event. The NRC-endorsed guidelines in NEI 12–06 do not consider concurrent, unrelated beyond-design-basis external events to be within the scope of the initiating events for the mitigation strategies. There is an assumption of a beyond-design-basis external event that establishes the event conditions for reasonable protection, and then it is assumed in NEI 12–06 that the event leads to an ELAP and LUHS. There is not, for example, an assumption of multiple beyond-design-basis external events occurring at the same time. As a result, reasonable protection for the purposes of compliance with § 50.155(c)(2) allows the provision of specific sets of equipment for specific hazards with the required protection for those sets of equipment being against the hazard for which the equipment is intended to be used.

The NRC use of the phrase ''reasonable protection'' in § 50.155(c)(2) is intended to distinguish this approach from the approach of the PDCs, consistent with GDC 2, which requires that SSCs important to safety be designed to withstand the effects of natural phenomena. Section 50.155(c)(2) allows damage to, or loss of, specific pieces of equipment so long as the capability to use sufficient sets of the remaining equipment to accomplish strategies and guidelines is retained. ''Reasonable protection'' also allows for protection of the equipment using structures that could deform as a result of natural phenomena, so long as the equipment could be deployed from the structure to its place of use.

The remaining portion of § 50.155(c)(2) sets the hazard level for which ''reasonable protection'' of the equipment must be provided. The hazard level is the level determined for the design basis for the facility for protection of safety-related SSCs from the effects of natural phenomena under § 50.155(c)(2).

Paragraph (d), ''Training Requirements''

Paragraph (d) requires that each licensee specified in § 50.155(a) provide for the training of licensee personnel that perform activities in accordance with the capabilities required under § 50.155(b).

Paragraph (e), ''Spent Fuel Pool Monitoring''

Paragraph (e) requires each licensee to provide a reliable means to remotely monitor wide-range water level for each SFP at its site until 5 years have elapsed since all of the fuel within that SFP was last used in a reactor vessel for power operation. This requirement enables effective prioritization of event mitigation and recovery actions following beyond-design-basis external events. This provision does not apply to General Electric Mark III upper containment pools. These pools are referred to in the UFSARs for the applicable plants, Clinton Power Station, Grand Gulf Nuclear Station, Perry Nuclear Power Plant, and River Bend Station, by different terms, such as ''upper containment fuel storage pool,'' ''upper containment fuel pool,'' and ''containment upper pool.'' The use of the term ''upper containment pool'' in § 50.155(e) and in this discussion of the paragraph means the pools described in those UFSARs by those terms. The Mark III upper containment pools are only to store fuel during refueling outages, at which time the upper pool and reactor coolant system are merged, mitigating the potential for operator distraction should an extreme event happen at that time. After refueling is completed, and the reactor is critical, no fuel can be stored in the upper pool, and instead fuel must either be in the reactor and used to generate power or it is spent fuel and stored in the SFP.

Paragraph (f), ''Documentation of Changes''

Paragraph (f) establishes requirements that govern changes in the implementation of the requirements of § 50.155. Prior to implementing a change, § 50.155(f)(1) requires the licensee to demonstrate that the provisions of § 50.155 continue to be met and to maintain documentation of changes until the requirements of § 50.155 no longer apply. This documentation requirement applies to all changes that impact the implementation of § 50.155. The NRC recognizes that the licensee will maintain documentation of non-significant changes as part of their normal procurement and configuration management programs.

Regarding the meaning of demonstrated compliance, changes to the implementation of § 50.155 that are consistent with the regulatory guidance supporting the MBDBE rule are acceptable. Additionally, changes to the implementation of the MBDBE requirements that are approved alternative approaches, which are shown to apply to the licensee's facility consistent with the NRC's approval, are also acceptable. Changes that are outside of endorsed guidance or approved alternatives can be demonstrated to comply with § 50.155; however, in this regard the NRC emphasizes that licensees should be mindful of the following context.

1. The NRC initially issued requirements for the mitigation of beyond-design-basis external events in the Mitigation Strategies Order under the adequate protection provision of

§ 50.109(a)(4)(ii). The NRC seeks to ensure through § 50.155(f) that the resulting capabilities are maintained. A failure to maintain the functional capabilities first imposed by the Mitigation Strategies Order and now part of the MBDBE rule would challenge the continued reasonable assurance of adequate protection of public health and safety and not equate to demonstrated compliance with § 50.155.

2. The mitigation strategies are intended to address uncertainties associated with beyond-design-basis external events, and the requirements as implemented provide a capability that can be used and adapted to any event that exceeds the external design basis of the facility. While it was necessary for practical reasons to make assumptions concerning a damage state and conditions that could then be used to provide this additional capability, it is equally important to preserve the attributes of the mitigation strategies that provide flexibility, and enable adaptation to unknown events. Significantly impacting these attributes would reduce the capability for a licensee to successfully apply the strategies to real events. Such a change would not constitute demonstrated compliance with § 50.155. For example, the mitigation strategies use multiple sets of equipment, use strategies and guidelines rather than step-by-step procedures, have contingencies for conditions more severe than the assumed damage state used to develop the capability, employ alternate connection points, and are supported with offsite resources to provide for an indefinite capability. All of these are important elements of the additional mitigation capability for beyond-design-basis external events required by § 50.155. Changes that result in a significant reduction of these attributes would result in the mitigation strategies being less flexible and adaptable and therefore being less likely to be successfully deployable following a beyond-design-basis external event. Such changes would not constitute demonstrated compliance. For example, permanent removal of a set of equipment clearly removes flexibility and lessens the potential for successful mitigation of a beyond-design-basis external event.

Paragraph (f)(2) requires that changes in the implementation of the requirements of § 50.155 subject to other change control requirements be processed via their respective change control processes, unless the changes being evaluated impact only the implementation of § 50.155. Changes to the implementation of § 50.155 can impact multiple aspects of the facility. Paragraph (f)(2) is intended to clearly identify that other change control requirements such as those in §§ 50.59, 50.54(p), 50.54(q), 73.58, and fire protection change controls may apply depending on the extent of the change and the aspects of the facility that are impacted. This requirement is not essential because it is the licensee's obligation to comply with all applicable regulations; however, given the complexity of facility changes, the NRC is maintaining this requirement to provide regulatory clarity in the final rule, consistent with public comment. For example, a change to an SSC having both a beyond-design-basis function for § 50.155 and a design-basis function, would have the aspects of the change involving its beyond-design-basis functions addressed under § 50.155(f), and the aspects of the change involving the design-basis functions addressed under § 50.59 or any other applicable change control requirement. Another example may be a change to deploy in place equipment for § 50.155, that in turn impacts ingress and egress for an area of the facility important for security, and therefore needs to be evaluated under § 73.58.

Paragraph (g), ''Implementation''

Paragraph (g) establishes the compliance schedule for the MBDBE rule. Paragraph (g) establishes a compliance date of 3 years following the effective date of the MBDBE rule for each holder of a 10 CFR part 50 operating license who received NRC Order EA–13–109 and a compliance date of 2 years following the effective date of the MBDBE rule for each holder of a 10 CFR part 50 operating license that did not receive NRC Order EA–13–109 and each holder of a 10 CFR part 52 combined license for which the Commission has made the § 52.103(g) finding as of the effective date of the rule.

Paragraph (h), ''Withdrawal of Orders and Removal of License Conditions''

Under § 50.155(h)(1), the Mitigation Strategies and SFPI Orders will be withdrawn on September 9, 2022.

Under § 50.155(h)(2), the reliable SFP/buffer pool level instrumentation, mitigation strategies for beyond-design-basis external events, and emergency planning license conditions, except for license condition 2.D(12)(g)1, will be deemed removed from the Enrico Fermi Nuclear Plant, Unit 3 license on September 9, 2019.

Under § 50.155(h)(3), the mitigation strategies for beyond-design-basis external events, reliable SFP instrumentation, and emergency planning license conditions will be deemed removed with the exception of license conditions 2.D(12)(j)1, from the William States Lee III Nuclear Station, Units 1 and 2 licenses September 9, 2019.

Under § 50.155(h)(4), the reliable SFP/buffer pool level instrumentation, mitigation strategies for beyond-design-basis external events, and emergency planning license conditions will be deemed removed with the exception of license condition 2.D(12)(f)1 from the North Anna Unit 3 license on September 9, 2019.

Under § 50.155(h)(5), the mitigation strategies for beyond-design-basis external events, reliable SFP instrumentation, and emergency planning license conditions will be deemed removed with the exception of license condition 2.D(12)(h)1 from the Turkey Point, Units 6 and 7 licenses on September 9, 2019.

10 CFR Part 50, Appendix E, Section IV, Training

This final rule modifies the reference in the § 50.54(hh)(2) exercise requirement within 10 CFR part 50, appendix E, section IV.F.2.j, to § 50.155(b)(2) to reflect the movement of the EDMG requirement. The final rule also includes administrative changes to use the numeral ''8'' rather than the word ''eight'' in the phrases ''8-year'' and ''8-calendar-year'' for consistency with other sections.

10 CFR Part 50, Appendix E, Section VI, Emergency Response Data Systems

The NRC is amending its Emergency Response Data Systems regulations to allow the use of technology-neutral equipment. The requirements in appendix E, section VI, paragraph 3.c are amended to replace the phrase ''onsite modem'' with ''equipment'' and remove the word ''unit.''

§ 52.80 Contents of Applications; Additional Technical Information

Section 52.80 identifies the required additional technical information to be included in an application for a combined license. Paragraph (d) is amended to require a combined license applicant to include the applicant's plans for implementing the requirements of § 50.155, including a schedule for achieving full compliance with these requirements. This paragraph requires the application to include a description of the equipment upon which the strategies and guidelines that are required by § 50.155(b)(1) rely, including the planned locations of the equipment and how the equipment and

SSCs meet the design requirements of § 50.155(c).

VII. Regulatory Flexibility Certification

Under the Regulatory Flexibility Act (5 U.S.C. 605(b)), the NRC certifies that this rule does not have a significant economic impact on a substantial number of small entities. This rule affects only the licensing and operation of nuclear power plants. The companies that own these plants do not fall within the scope of the definition of ''small entities'' set forth in the Regulatory Flexibility Act or established in § 2.810, ''NRC size standards.''

VIII. Availability of Regulatory Analysis

The NRC has prepared a regulatory analysis on this regulation. The analysis examined the costs and benefits of the alternatives considered by the NRC. The regulatory analysis is available as indicated in Section XIX of this document.

IX. Availability of Guidance

The NRC is issuing regulatory guidance for the implementation of the MBDBE rule. The guidance is available in ADAMS under Accession Nos. ML19058A012 and ML19058A013. You may access information and comment submissions related to the guidance by searching on *http://www.regulations.gov* under Docket ID NRC–2014–0240. The guidance to implement the MBDBE rule consists of two RGs which are discussed below.

The RG 1.226, ''Flexible Mitigation Strategies for Beyond-Design-Basis Events,'' endorses, with clarifications, the methods and procedures in NEI 12–06, ''Diverse and Flexible Coping Strategies (FLEX) Implementation Guide.'' This regulatory guidance provides licensees and applicants with an acceptable method of implementing the MBDBE rule primarily with regard to the provisions in § 50.155(b)(1), (c), and (f) regarding measures for the mitigation of beyond-design-basis external events. Previous versions of this guidance were endorsed to support compliance with the Mitigation Strategies Order. Licensees who used previous endorsed versions of NEI 12–06 are not required to revise their implementation under the Mitigation Strategies Order to address the MBDBE rule requirements. The later revisions of the endorsed guidance contain additional information for addressing reevaluated hazard information, frequently asked questions, and acceptable alternatives, and accordingly provide a larger set of guidance that licensees may use to implement the MBDBE rule, or to consult when deciding on the acceptability of changes to the implementation of the MBDBE rule requirements.

The RG 1.227, ''Wide-Range Spent Fuel Pool Level Instrumentation,'' endorses with exceptions and clarifications NEI 12–02, Revision 1. This guidance provides an acceptable method of implementing the MBDBE rule requirement in § 50.155(e). This RG does not differ in a significant manner from previously endorsed guidance for the SFPI Order, which was JLD–ISG–2012–03.

The NRC is discontinuing further regulatory action on Draft Regulatory Guide (DG) DG–1319, ''Integrated Response Capabilities for Beyond-Design-Basis Events.'' Draft Regulatory Guide DG–1319 was a proposed new regulatory guide (RG 1.228) developed by the staff to provide implementing guidance for provisions that have been removed from the final rule for the reasons discussed in Section IV, ''Public Comments and Changes to the Rule.'' Because the relevant regulatory requirements have been removed from the final rule, further NRC action to develop and adopt DG–1319 as a final guidance document is not needed. Therefore, this notice announces the NRC's decision to discontinue further action on DG–1319 and documents the final NRC action on DG–1319.

X. Backfitting and Issue Finality

Rule

As required by §§ 50.109 and 52.98, the Commission has completed a backfitting and issue finality assessment for this rule. The Commission finds that the change to the types of certifications that COL holders must submit before the requirements of § 50.54(hh)(1) no longer apply is inconsistent with the issue finality provisions of 10 CFR part 52. The change is justified as necessary for adequate protection of public health and safety or common defense and security. Availability of the backfit and issue finality assessment is indicated in Section XIX of this document.

Regulatory Guidance

The NRC is issuing two RGs that provide guidance for the implementation of this rule: RG 1.226 and RG 1.227. These RGs provide guidance on the methods acceptable to the NRC for complying with this final rule. The RGs apply to all current holders of, and applicants for operating licenses under 10 CFR part 50 and COLs under 10 CFR part 52.

Issuance of the RGs does not constitute backfitting under § 50.109 and is not otherwise inconsistent with the issue finality provisions under 10 CFR part 52. As discussed in the ''Implementation'' section of each RG, the NRC has no current intention to impose the RGs on current holders of an operating license or COL.

Applying the RGs to applications for operating licenses or COLs does not constitute backfitting as defined in § 50.109 and is not otherwise inconsistent with issue finality under 10 CFR part 52, because such applicants are not within the scope of entities protected by § 50.109 or the applicable issue finality provisions in 10 CFR part 52.

XI. Cumulative Effects of Regulation

The NRC engaged extensively with external stakeholders throughout this rulemaking and related regulatory activities. Public involvement has included: (1) Issuance of two ANPRs and two draft regulatory basis documents that requested stakeholder feedback; (2) issuance of conceptual and preliminary proposed rule language in support of public meetings; (3) numerous public meetings with the ACRS; (4) issuance of draft final rule language to support meeting with the ACRS, (5) a public meeting held during the final rule stage to gather additional feedback concerning CER, and (6) many more public meetings that supported both the development of the draft regulatory basis documents as well as development of the implementing guidance for the two orders that this rulemaking makes generically applicable (*i.e.,* the Mitigation Strategies and SFPI Orders). Section II, ''Opportunities for Public Involvement,'' of this document provides a more detailed discussion of public involvement.

The NRC requested and received feedback following its CER process. The feedback received is discussed in more detail in conjunction with the consideration of a flexible scheduling provision, in Section IV of this document. Most significantly, this final rule includes an additional year for implementation for licensees that received Order EA–13–109 that is intended to address the CER feedback received.

Regarding the CER process requirements for issuance of guidance, the NRC is issuing two RGs in conjunction with the issuance of the final rule as discussed in Section IX of this document. Additionally, the NRC issued draft guidance with the proposed rule for comment, which enabled more informed external stakeholder feedback to be obtained.

XII. Plain Writing

The Plain Writing Act of 2010 (Pub. L. 111–274) requires Federal agencies to write documents in a clear, concise, and well-organized manner. The NRC has written this document to be consistent with the Plain Writing Act as well as the Presidential Memorandum, ''Plain Language in Government Writing,'' published June 10, 1998 (63 FR 31883).

XIII. Environmental Assessment and Finding of No Significant Environmental Impact

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in subpart A of 10 CFR part 51, that this rule is not a major Federal action significantly affecting the quality of the human environment, and therefore an environmental impact statement is not required. The basis of this determination reads as follows: The action will not result in any radiological effluent impact as it will not change any design basis structures, systems, or components that function to limit the release of radiological effluents during or after an accident. This final rule does not change the standards and requirements for radiological releases and effluents. None of the revisions or additions in this rule affect current occupational or public radiation exposure. The final rule will not cause any significant non-radiological impacts, as it will not affect any historic sites or any non-radiological plant effluents. The NRC concludes that this rule will not cause any significant radiological or non-radiological impacts on the human environment.

The NRC requested the views of the States on the environmental assessment for this rule. No views were received.

The determination of this environmental assessment is that there will be no significant effect on the quality of the human environment from this action. The environmental assessment is available as indicated in Section XIX of this document.

XIV. Paperwork Reduction Act

This rule contains new or amended information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). The collections of information were approved by the Office of Management and Budget, approval numbers 3150–0011 and 3150–0151.

The burden to the public for the information collections is estimated to average 415 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection.

The information collection is being conducted to make changes to existing programs, plans, procedures, and guidelines implemented as a result of the Mitigating Strategies and SFPI Orders to reflect the new requirements of this rule, which replaces the order requirements. This information will be used by the NRC to support oversight activities associated with these requirements. Responses to this collection of information are mandatory.

You may submit comments on any aspect of the information collections, including suggestions for reducing the burden, by the following methods:

- *Federal rulemaking website:* Go to *http://www.regulations.gov* and search for Docket ID NRC–2014–0240.
- *Mail comments to:* Information Services Branch, Office of the Chief Information Officer, Mail Stop: T6–A10M, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001 or to: OMB Office of Information and Regulatory Affairs (3150–0011), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: *oira_submission@omb.eop.gov.*

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

XV. Congressional Review Act

This final rule is a rule as defined in the Congressional Review Act (5 U.S.C. 801–808). However, the Office of Management and Budget has not found it to be a major rule as defined in the Congressional Review Act.

XVI. Criminal Penalties

For the purposes of Section 223 of the Atomic Energy Act of 1954, as amended (AEA), the NRC is issuing this rule that amends 10 CFR parts 50 and 52 under one or more of Sections 161b, 161i, or 161o of the AEA. Willful violations of the rule are subject to criminal enforcement. Criminal penalties as they apply to regulations in 10 CFR parts 50 and 52 are discussed in §§ 50.111 and 52.303.

XVII. Compatibility of Agreement State Regulations

Under the ''Policy Statement on Adequacy and Compatibility of Agreement State Programs,'' approved by the Commission on June 20, 1997, and published in the **Federal Register** (62 FR 46517; September 3, 1997), this rule is classified as compatibility category ''NRC.'' Compatibility is not required for Category ''NRC'' regulations. The NRC program elements in this category are those that relate directly to areas of regulation reserved to the NRC by the AEA or the provisions of title 10 of the *Code of Federal Regulations,* and although an Agreement State may not adopt program elements reserved to the NRC, it may wish to inform its licensees of certain requirements via a mechanism that is consistent with a particular State's administrative procedure laws, but does not confer regulatory authority on the State.

XVIII. Voluntary Consensus Standards

The National Technology Transfer and Advancement Act of 1995, Public Law 104–113, requires that Federal agencies use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. In this rule, the NRC is adding requirements for the mitigation of beyond-design-basis events. This action does not constitute the establishment of a standard that contains generally applicable requirements.

XIX. Availability of Documents

The documents identified in the following table are available to interested persons through one or more of the following methods, as indicated.

Document	ADAMS accession No./ web link/**Federal Register** citation
Primary Rulemaking Documents	
Regulatory Analysis Addendum—Final Rule to Address Mitigation of Beyond-Design-Basis Events	ML19058A009
Backfitting and Issue Finality Assessment Supporting the Mitigation of Beyond-Design-Basis Events Final Rule	ML19059A150
Environmental Assessment Supporting the Mitigation of Beyond-Design-Basis Events Final Rule	ML19058A008
Supporting Statement for Information Collections Contained in Mitigation of Beyond-Design-Basis Events Final Rule—10 CFR Part 50.	ML19058A010
Supporting Statement for Information Collections Contained in Mitigation of Beyond-Design-Basis Events Final Rule—10 CFR Part 52.	ML19058A011
NRC Response to Public Comments—Final Rule: Mitigation of Beyond-Design-Basis Events	ML19058A007
Regulatory Guides	
RG 1.226, Flexible Mitigation Strategies for Beyond-Design-Basis Events	ML19058A012
RG 1.227, Wide-Range Spent Fuel Pool Level Instrumentation	ML19058A013
Other References	
ACRS Transcript—Fukushima Subcommittee, ''Discuss Preliminary Mitigation of Beyond-Design-Basis Events Rulemaking Language,'' November 21, 2014.	ML14337A671
ACRS Transcript—Full Committee, ''Discuss Consolidation of Station Blackout Mitigation Strategies and Onsite Emergency Response Capabilities Rulemakings,'' July 10, 2014.	ML14223A631
ACRS Transcript—Full Committee, ''Discuss Preliminary Mitigation of Beyond-Design-Basis Events Rulemaking Language,'' December 4, 2014.	ML14345A387
ACRS Transcript—Full Committee, ''Discuss the Station Blackout Mitigation Strategies Regulatory Basis,'' June 5, 2013.	ML13175A344
ACRS Transcript—Joint Fukushima and Probabilistic Risk Assessment Subcommittees, ''Discuss CPRR Technical Analysis,'' August 22, 2014.	ML14265A059
ACRS Transcript—Plant Operations and Fire Protection Subcommittee, ''Discuss the Onsite Emergency Response Capabilities Regulatory Basis,'' February 6, 2013.	ML13063A403
ACRS Transcript—Regulatory Policies and Practices Subcommittee, ''Discuss the Station Blackout Mitigation Strategies Regulatory Basis,'' December 5, 2013, and April 23, 2013.	ML13148A404
ACRS Transcript—Reliability and Probabilistic Risk Assessment Subcommittee, ''Discuss CPRR Technical Analysis,'' November 19, 2014.	ML14337A651
American National Standards Institute/American Nuclear Society 3.2–2012, ''Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants''.	*http://www.ans.org/store/*
American Society for Civil Engineers Standard 7–10, ''Minimum Design Loads for Buildings and Other Structures,'' 2013.	*http://www.ascelibrary.org/*
COMGBJ–11–0002, ''NRC Actions Following the Events in Japan,'' March 21, 2011	ML110800456
COMSECY–13–0002, ''Consolidation of Japan Lessons Learned Near-Term Task Force Recommendations 4 and 7 Regulatory Activities,'' January 25, 2013.	ML13011A037
COMSECY–13–0010, ''Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned,'' March 27, 2013.	ML12339A262
COMSECY–14–0037, ''Integration of Mitigating Strategies for Beyond-Design-Basis External Events and The Reevaluation of Flooding Hazards,'' November 21, 2014.	ML14309A256
''Consolidated Rulemaking—Proof of Concept'' (Conceptual Consolidated Preliminary Proposed Rule Language for NTTF Recommendations 4, 7, 8 and 9), February 21, 2014.	ML14052A057
''Crystal River Unit 3—NRC Response to Duke Energy's Final Response to the March 2012 Request for Information Letter,'' January 22, 2014.	ML13325A847
''Crystal River Unit 3 Nuclear Generating Plant—Rescission of Order EA–12–049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events,''' August 27, 2013.	ML13212A366
''Crystal River Unit 3—Final Response to March 12, 2012 Information Request Regarding Recommendations 2.1, 2.3 and 9.3,'' September 25, 2013.	ML13274A341
''Crystal River Unit 3 Nuclear Generating Plant—Rescission of Order EA–12–051, 'Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,''' August 27, 2013.	ML13203A161
''Draft Regulatory Basis for Containment Protection and Release Reduction for Mark I and Mark II Boiling Water Reactors (10 CFR Part 50),'' May 2015.	ML15022A214
Executive Order 13744, ''Coordinating Efforts To Prepare the Nation for Space Weather Events,'' October 13, 2016.	81 FR 71573
Federal Register Notice—Enhancements to Emergency Preparedness Regulations, Final Rule, November 23, 2011.	76 FR 72560
Federal Register Notice—Mitigation of Beyond-Design-Basis Events, Proposed Rule, November 13, 2015	80 FR 70609
Federal Register Notice—Mitigation of Beyond-Design-Basis Events, Proposed Rule; correction, November 30, 2015.	80 FR 74717
Federal Register Notice—Onsite Emergency Response Capabilities, Advance Notice of Proposed Rulemaking, April 18, 2012.	77 FR 23161
Federal Register Notice—Onsite Emergency Response Capabilities, Draft Regulatory Basis, January 8, 2013	78 FR 1154
Federal Register Notice—Onsite Emergency Response Capabilities, Preliminary Proposed Rule Language, November 15, 2013.	78 FR 68774
Federal Register Notice—Onsite Emergency Response Capabilities, Regulatory Basis, October 25, 2013	78 FR 63901
Federal Register Notice—Power Reactor Security Requirements, Final Rule, March 27, 2009	74 FR 13926

Document	ADAMS accession No./ web link/**Federal Register** citation
Federal Register Notice—PRM–50–100, Petition for Rulemaking Submitted by the Natural Resources Defense Council, Inc., July 23, 2013.	78 FR 44034
Federal Register Notice—PRM–50–101, Petition for Rulemaking Submitted by the Natural Resources Defense Council, Inc., March 21, 2012.	77 FR 16483
Federal Register Notice—PRM–50–102, Petition for Rulemaking; Submitted by the Natural Resources Defense Council, Inc., April 27, 2012.	77 FR 25104
Federal Register Notice—PRM–50–96, Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools, Consideration in the Rulemaking Process, December 18, 2012.	77 FR 74788
Federal Register Notice—PRM–50–97, PRM–50–98, PRM–50–99, PRM–50–100, PRM–50–101, PRM–50–102, Petitions for Rulemaking Submitted by the Natural Resources Defense Council, Inc., Notice of Receipt, September 20, 2011.	76 FR 58165
Federal Register Notice—Regulatory Improvements for Decommissioning Power Reactors, Advance Notice of Proposed Rulemaking, November 19, 2015.	80 FR 72358
Federal Register Notice—Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors; Final Rule, November 22, 2004.	69 FR 68008
Federal Register Notice—Statement of Principles and Policy for the Agreement State Program; Policy Statement on Adequacy and Compatibility of Agreement State Programs, Final Policy Statements, September 3, 1997.	62 FR 46517
Federal Register Notice—Station Blackout, Advance Notice of Proposed Rulemaking, March 20, 2012	77 FR 16175
Federal Register Notice—Station Blackout Mitigation Strategies, Draft Regulatory Basis and Draft Rule Concepts, April 10, 2013.	78 FR 21275
Federal Register Notice—Station Blackout Mitigation Strategies, Regulatory Basis, July 23, 2013	78 FR 44035
''Fort Calhoun Station, Unit 1—Relaxation of the Schedule Requirements for Order EA–12–049, 'Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events' (CAC No. MF0969),'' November 21, 2016.	ML16277A509
''Fort Calhoun Station, Unit 1—Rescission of Order EA–12–051, 'Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation' (CAC No. MF0968),'' December 8, 2016.	ML16320A287
Inspection Manual Chapter (IMC) 0308, ''Reactor Oversight Process Basis Document,'' Attachment 2, ''Technical Basis for Inspection Program,'' October 16, 2006.	ML062890421
Interim Staff Guidance, NSIR/DPR–ISG–01, ''Emergency Planning for Nuclear Power Plants,'' November 2011	ML113010523
JLD–ISG–2012–01, ''Compliance with Order EA–12–049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,'' Revision 0, August 29, 2012.	ML12229A174
JLD–ISG–2012–01, ''Compliance with Order EA–12–049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,'' Revision 1, January 22, 2016.	ML15357A163
JLD–ISG–2012–01, ''Compliance with Order EA–12–049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,'' Draft Revision 2, November 4, 2016.	ML16277A617
JLD–ISG–2012–03, ''Compliance with Order EA–12–051, Reliable Spent Fuel Pool Instrumentation,'' Revision 0, August 29, 2012.	ML12221A339
''Kewaunee Power Station—60-Day Response to March 12, 2012, Information Request Regarding Recommendation 2.1, Seismic Reevaluations,'' April 29, 2013.	ML13123A004
''Kewaunee Power Station—Rescission of Order EA–12–049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events' (TAC No. MF2774)'' June 10, 2014.	ML14059A411
''Kewaunee Power Station—Response to Request for Relief from Responding Further to the March 2012 Request for Information Letter for Recommendation 9.3,'' January 22, 2014.	ML13322B255
Letter from Anne T. Boland, NRC, to J.W. Shea, TVA, ''Watts Bar Nuclear Plant, Unit 2—Request for Tennessee Valley Authority's Consent to Imposition of New Requirement Related to Mitigation of Beyond-Design-Basis Events,'' February 15, 2017.	ML17040A353
Letter from Anthony R. Pietrangelo, NEI, to Mark A. Satorius, NRC, ''Use of Qualitative Factors in Regulatory Decision Making,'' May 11, 2015.	ML15217A314
Letter from Eric J. Leeds to Holders of Licenses for Operating Power Reactors as Listed in the Enclosure, ''Rescission or Partial Rescission of Certain Power Reactor Security Orders Applicable to Nuclear Power Plants,'' November 28, 2011.	ML111220447
Letter from J. E. Dyer, NRC, to Holders of Licenses for Operating Power Reactors Listed in the Enclosure, ''Order Requiring Compliance with Key Radiological Protection Mitigation Strategies,'' August 28, 2006.	ML062300304
Letter from J. Sam Armijo, ACRS Chairman, to Mr. R. W. Borchardt, ''Response to February 27, 2012 Letter Regarding Final Disposition of Fukushima-Related ACRS Recommendations in Letters Dated October 13, 2011, and November 8, 2011,'' March 13, 2012.	ML12072A197
Letter from J. W. Shea to NRC Document Control Desk, ''Watts Bar Nuclear Plant, Unit 2—Response to NRC Request for TVA's Consent to Imposition of New Requirement Related to Mitigation of Beyond-Design-Basis Events,'' March 1, 2017.	ML17061A121
Letter from John W. Stetkar, ACRS Chairman, to Chairman Stephen G. Burns, NRC, ''Draft SECY Paper Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150–AJ49),'' April 22, 2015.	ML15111A271
Letter from Mark A. Satorius to John W. Stetkar, ACRS, ''Draft SECY Paper 'Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150–AJ49)','' May 15, 2015.	ML15125A485
Letter from Said Abdel-Khalik, ACRS Chairman, to Chairman Gregory B. Jaczko, NRC, ''Initial ACRS Review of: (1) the NRC Near-Term Task Force Report on Fukushima and (2) Staff's Recommended Actions To Be Taken Without Delay,'' October 13, 2011.	ML11284A136
Memorandum from R. W. Borchardt to J. Sam Armijo, ACRS Chairman, ''Final Disposition of the Advisory Committee on Reactor Safeguards' Review of (1) the U.S. Nuclear Regulatory Commission Near-Term Task Force Report on Fukushima, (2) Staff's Recommended Actions To Be Taken Without Delay (SECY-11-0124), and (3) Staff's Prioritization of Recommended Actions To Be Taken in Response to Fukushima Lessons-Learned (SECY–11–0137),'' February 27, 2012.	ML12030A198
NEI 06–12, ''B.5.b Phase 2 & 3 Submittal Guideline,'' Revision 2, December 2006	ML070090060

Document	ADAMS accession No./ web link/**Federal Register** citation
NEI 10–05, ''Assessment of On-Shift Emergency Response Organization Staffing and Capabilities,'' Revision 0, June 2011.	ML111751698
NEI 12–01, ''Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities,'' Revision 0, May 2012.	ML12125A412
NEI 12–02, ''Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify License with Regard to Reliable Spent Fuel Pool Instrumentation','' Revision 1, August 2012.	ML122400399
NEI 12–06, ''Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,'' Revision 0, August 2012	ML12242A378
NEI 12–06, ''Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,'' Revision 1A, October 2015 ...	ML15279A426
NEI 12–06, ''Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,'' Revision 2, December 2015	ML16005A625
NEI 12–06, ''Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,'' Revision 3, September 2016	ML16267A274
NEI 13–06, ''Enhancements to Emergency Response Capabilities for Beyond Design Basis Events and Severe Accidents,'' Revision 0, September 2014.	ML14269A230
NEI 13–06, ''Enhancements to Emergency Response Capabilities for Beyond Design Basis Events and Severe Accidents,'' Revision 1, February 2016.	ML16224A618
NEI 14–01, ''Emergency Response Procedures and Guidelines for Beyond Design Basis Events and Severe Accidents,'' Revision 0, September 2014.	ML14269A236
NEI 14–01, ''Emergency Response Procedures and Guidelines for Beyond Design Basis Events and Severe Accidents,'' Revision 1, February 2016.	ML16224A619
NEI 91–04, ''Severe Accident Issue Closure Guidelines,'' Revision 1, December 1994	ML072850981
Non-concurrence NCP–2015–003	ML15091A646
Non-concurrence NCP–2016–018	ML16312A020
NUREG–0654/FEMA–REP–1, ''Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,'' Revision 1, November 1980.	ML040420012
NUREG–0660, Vol. 1, ''NRC Action Plan Developed as a Result of the TMI–2 Accident,'' May 1980	ML072470526
NUREG–0660, Vol. 2, ''NRC Action Plan Developed as a Result of the TMI–2 Accident,'' May 1980	ML072470524
NUREG–0711, ''Human Factors Engineering Program Review Model,'' Revision 3, November 2012	ML12324A013
NUREG–0737, ''Clarification of TMI Action Plan Requirements,'' November 1980	ML102560051
NUREG–0737, ''Clarification of TMI Action Plan Requirements,'' Supplement 1, January 1983	ML102560009
NUREG–0800, ''Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition,'' Section 19.4, ''Strategies and Guidance To Address Loss-of-Large Areas of the Plant Due to Explosions and Fires,'' June 2015.	ML13316B202
NUREG–1935, ''State-of-the-Art Reactor Consequence Analyses (SOARCA) Report,'' November 2012	ML12332A057
''Omaha Public Power District's Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events (Order Number EA–12–049,'' February 28, 2013.	ML13116A208
Order EA–02–026, ''Order for Interim Safeguards and Security Compensatory Measures,'' February 25, 2002	ML020510635
Order EA–06–137, ''Order Modifying Licenses,'' June 20, 2006	ML061600076
Order EA–12–049, ''Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,'' (Mitigation Strategies Order), March 12, 2012.	ML12054A735
Order EA–12–051, ''Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'' (SFPI Order), March 12, 2012.	ML12056A044
Order EA–13–109, ''Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions,'' June 6, 2013.	ML13130A067
''Preliminary Proposed Rule Language for Mitigation of Beyond-Design-Basis Events Rulemaking,'' August 15, 2014.	ML14218A253
''Preliminary Proposed Rule Language for Mitigation of Beyond-Design-Basis Events Rulemaking,'' made available to the public on November 13, 2014, and December 8, 2014, to support public discussion with the ACRS.	ML14336A641
PRM–50–96, ''Petition for Rulemaking Submitted by Thomas Popik on Behalf of the Foundation for Resilient Societies To Adopt Regulations that Would Require Facilities Licensed by the NRC under 10 CFR Part 50 To Assure Long-Term Cooling and Unattended Water Makeup of Spent Fuel Pools,'' March 14, 2011.	ML110750145
PRM–50–97, ''NRDC's Petition for Rulemaking To Require Emergency Preparedness Enhancements for Prolonged Station Blackouts,'' July 26, 2011.	ML11216A237
PRM–50–98, ''NRDC's Petition for Rulemaking To Require Emergency Preparedness Enhancements for Multiunit Events,'' July 26, 2011.	ML11216A238
PRM–50–100, ''NRDC's Petition for Rulemaking To Require Licensees to Improve Spent Nuclear Fuel Pool Safety,'' July 26, 2014.	ML11216A240
PRM–50–101, ''NRDC's Petition for Rulemaking To Revise 10 CFR § 50.63,'' July 26, 2011	ML11216A241
PRM–50–102, ''NRDC's Petition for Rulemaking To Require More Realistic Training on Severe Accident Mitigation Guidelines,'' July 26, 2011.	ML11216A242
Regulatory Issue Summary 2009–13, ''Emergency Response Data System Upgrade from Modem to Virtual Private Network Appliance,'' September 28, 2009.	ML092670124
''Request for Information Pursuant to Title 10 of the *Code of Federal Regulations* 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident,'' March 12, 2012.	ML12053A340
San Onofre Nuclear Generating Station Units 2 and 3, ''Final Response to the March 12, 2012 Information Request Regarding Near-Term Task Force Recommendations 2.1, 2.3, and 9.3 and Corresponding Commitments San Onofre Nuclear Generating Station (SONGS) Units 2 and 3,'' September 30, 2013.	ML13276A020
''San Onofre Nuclear Generating Station, Units 2 and 3—NRC Response to Southern California Edison's Final Response to the March 2012 Request for Information Letter,'' January 22, 2014.	ML13329A826
''San Onofre Nuclear Generating Station, Units 2 and 3—Rescission of Order EA–12–049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events' (TAC Nos. MF2657 and MF2658),'' June 30, 2014.	ML14113A572

Document	ADAMS accession No./ web link/**Federal Register** citation
"San Onofre Nuclear Generating Station, Units 2 and 3—Rescission of Order EA–12–051, 'Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation' (TAC Nos. MF0917 and MF0918)," June 30, 2014.	ML14111A069
SECY–11–0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," July 12, 2011.	ML11186A950
SECY–11–0124, "Recommended Actions To Be Taken Without Delay from the Near-Term Task Force Report," September 9, 2011.	ML11245A127
SECY–11–0137, "Prioritization of Recommended Actions To Be Taken in Response to Fukushima Lessons Learned," October 3, 2011.	ML11272A111
SECY–12–0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Tsunami," February 17, 2012.	ML12039A103
SECY–13–0132, "Plan for Updating the U.S. Nuclear Regulatory Commission's Cost Benefit Guidance," January 2, 2014.	ML13274A495
SECY–14–0046, "Fifth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami," April 17, 2014.	ML14064A523
SECY–15–0050, "Cumulative Effects of Regulation Process Enhancements and Risk Prioritization Initiative," April 1, 2015.	ML15034A360
SECY–15–0065, "Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150–AJ49)," April 30, 2015.	ML15049A201
SECY–15–0085, "Evaluation of the Containment Protection & Release Reduction for Mark I and Mark II Boiling Water Reactors Rulemaking Activities (10 CFR Part 50) (RIN–3150–AJ26)," enclosure entitled, "Containment Protection and Release Reduction (CPRR) Rulemaking: Draft Regulatory Basis," June 18, 2015.	ML15005A079
SECY–16–0142, "Draft Final Rule—Mitigation of Beyond-Design-Basis Events (RIN 3150–AJ49)," December 15, 2016.	ML16301A005
SECY–89–012, "Staff Plans for Accident Management Regulatory and Research Programs," January 18, 1989	ML19126A278
SECY–97–132, "Status of the Integration Plan for Closure of Severe Accident Issues and the Status of Severe Accident Research," June 23, 1997.	ML992930144
SECY–98–131, "Status of the Integration Plan for Closure of Severe Accident Issues and the Status of Severe Accident Research," June 8, 1998.	ML992880008
SRM–COMSECY–13–0002, "Consolidation of Japan Lessons Learned Near-Term Task Force Recommendations 4 and 7 Regulatory Activities," March 4, 2013.	ML13063A548
SRM–COMSECY–14–0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and The Reevaluation of Flooding Hazards," March 30, 2015.	ML15089A236
SRM–SECY–11–0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," August 19, 2011.	ML112310021
SRM–SECY–11–0124, "Recommended Actions To Be Taken Without Delay From the Near-Term Task Force Report," October 18, 2011.	ML112911571
SRM–SECY–11–0137, "Prioritization of Recommended Actions To Be Taken in Response to Fukushima Lessons Learned," December 15, 2011.	ML113490055
SRM–SECY–13–0132, "U.S. Nuclear Regulatory Commission Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force Report," May 19, 2014.	ML14139A104
SRM–SECY–15–0065, "Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150–AJ49)," August 27, 2015.	ML15239A767
SRM–M190124A: Affirmation Session-SECY–16–0142: Final Rule: Mitigation of Beyond-Design-Basis Events (RIN 3150–AJ49), January 24, 2019.	ML19023A038
Temporary Instruction 2515/191, "Inspection of the Licensee's Responses to Mitigation Strategies Order EA–12–049, Spent Fuel Pool Instrumentation Order EA–12–051 and Emergency Preparedness Information Requested in NRC March 12, 2012," March 12, 2012.	ML14273A444
"Vermont Yankee Nuclear Power Station—Rescission of Order EA-12-049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events' (TAC No. MF4763)," March 2, 2015.	ML14321A685
"Vermont Yankee Nuclear Power Station—Rescission of Order EA-12-051, 'Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation' (TAC No. MF4764)," March 2, 2015.	ML14321A696

The NRC may post documents related to this rulemaking, including public comments, on the Federal rulemaking website at *http://www.regulations.gov* under Docket ID NRC–2014–0240. The Federal rulemaking website allows you to receive alerts when changes or additions occur in a docket folder. To subscribe: (1) Navigate to the docket folder (NRC–2014–0240); (2) click the "Sign up for Email Alerts" link; and (3) enter your email address and select how frequently you would like to receive emails (daily, weekly, or monthly).

List of Subjects

10 CFR Part 50

Administrative practice and procedure, Antitrust, Backfitting, Classified information, Criminal penalties, Education, Fire prevention, Fire protection, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Penalties, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements, Whistleblowing.

10 CFR Part 52

Administrative practice and procedure, Antitrust, Backfitting, Combined license, Early site permit, Emergency planning, Fees, Incorporation by reference, Inspection, Limited work authorization, Nuclear power plants and reactors, Penalties, Probabilistic risk assessment, Prototype, Reactor siting criteria, Redress of site, Reporting and recordkeeping requirements, Standard design, Standard design certification.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 552 and 553, the NRC is adopting the following amendments to 10 CFR parts 50 and 52:

PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

■ 1. The authority citation for 10 CFR part 50 continues to read as follows:

Authority: Atomic Energy Act of 1954, secs. 11, 101, 102, 103, 104, 105, 108, 122, 147, 149, 161, 181, 182, 183, 184, 185, 186, 187, 189, 223, 234 (42 U.S.C. 2014, 2131, 2132, 2133, 2134, 2135, 2138, 2152, 2167, 2169, 2201, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2239, 2273, 2282); Energy Reorganization Act of 1974, secs. 201, 202, 206, 211 (42 U.S.C. 5841, 5842, 5846, 5851); Nuclear Waste Policy Act of 1982, sec. 306 (42 U.S.C. 10226); National Environmental Policy Act of 1969 (42 U.S.C. 4332); 44 U.S.C. 3504 note; Sec. 109, Pub. L. 96–295, 94 Stat. 783.

§ 50.8 [Amended]

■ 2. In § 50.8(b), add the number ''50.155,'' sequentially.

■ 3. In § 50.34, remove the word ''stationary'' from paragraphs (a)(13) and (b)(12), and revise paragraph (i).

The revision reads as follows:

§ 50.34 Contents of applications; technical information.

* * * * *

(i) *Mitigation of beyond-design-basis events.* Each application for a power reactor operating license under this part must include the applicant's plans for implementing the requirements of § 50.155, including a schedule for achieving full compliance with these requirements and a description of the equipment upon which the strategies and guidelines required by § 50.155(b)(1) rely, including the planned locations of the equipment and how the equipment meets the requirements of § 50.155(c).

■ 4. In § 50.54, remove paragraph (hh)(2), redesignate paragraph (hh)(3) as (hh)(2) and revise it.

The revision reads as follows:

§ 50.54 Conditions of licenses.

* * * * *

(hh) * * *

(2) Paragraph (hh)(1) of this section does not apply to a licensee that has submitted the certifications required under § 50.82(a)(1) or § 52.110(a) of this chapter.

* * * * *

■ 5. Add § 50.155 to read as follows:

§ 50.155 Mitigation of beyond-design-basis events.

(a) *Applicability.* (1) Each holder of an operating license for a nuclear power reactor under this part and each holder of a combined license under part 52 of this chapter for which the Commission has made the finding under § 52.103(g) of this chapter shall comply with the requirements of this section until submittal of the license holder's certifications described in § 50.82(a)(1) or § 52.110(a) of this chapter.

(2)(i) Once the certifications described in § 50.82(a)(1) or § 52.110(a) of this chapter have been submitted by a licensee subject to the requirements of this section, that licensee need only comply with the requirements of paragraphs (b) through (d) and (f) of this section associated with spent fuel pool cooling capabilities.

(ii) Holders of operating licenses or combined licenses for which the certifications described in § 50.82(a)(1) or § 52.110(a) of this chapter have been submitted need not meet the requirements of this section except for the requirements of paragraph (b)(2) of this section associated with spent fuel pool cooling capabilities once the decay heat of the fuel in the spent fuel pool can be removed solely by heating and boiling of water within the spent fuel pool and the boil-off period provides sufficient time for the licensee to obtain off-site resources to sustain the spent fuel pool cooling function indefinitely, as demonstrated by an analysis performed and retained by the licensee.

(iii) The holder of the license for Millstone Power Station, Unit 1, is not subject to the requirements of this section.

(iv) Holders of operating licenses or combined licenses for which the certifications described in § 50.82(a)(1) or § 52.110(a) of this chapter have been submitted need not meet the requirements of this section once all irradiated fuel has been permanently removed from the spent fuel pool(s).

(b) *Strategies and guidelines.* Each applicant or licensee shall develop, implement, and maintain:

(1) Mitigation strategies for beyond-design-basis external events—Strategies and guidelines to mitigate beyond-design-basis external events from natural phenomena that are developed assuming a loss of all ac power concurrent with either a loss of normal access to the ultimate heat sink or, for passive reactor designs, a loss of normal access to the normal heat sink. These strategies and guidelines must be capable of being implemented site-wide and must include the following:

(i) Maintaining or restoring core cooling, containment, and spent fuel pool cooling capabilities; and

(ii) The acquisition and use of offsite assistance and resources to support the functions required by paragraph (b)(1)(i) of this section indefinitely, or until sufficient site functional capabilities can be maintained without the need for the mitigation strategies.

(2) Extensive damage mitigation guidelines—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 impacted by the event, due to explosions or fire, to include strategies and guidelines in the following areas:

(i) Firefighting;

(ii) Operations to mitigate fuel damage; and

(iii) Actions to minimize radiological release.

(c) *Equipment.* (1) The equipment relied on for the mitigation strategies and guidelines required by paragraph (b)(1) of this section must have sufficient capacity and capability to perform the functions required by paragraph (b)(1) of this section.

(2) The equipment relied on for the mitigation strategies and guidelines required by paragraph (b)(1) of this section must be reasonably protected from the effects of natural phenomena that are equivalent in magnitude to the phenomena assumed for developing the design basis of the facility.

(d) *Training requirements.* Each licensee shall provide for the training of personnel that perform activities in accordance with the capabilities required by paragraphs (b)(1) and (2) of this section.

(e) *Spent fuel pool monitoring.* In order to support effective prioritization of event mitigation and recovery actions, each licensee shall provide reliable means to remotely monitor wide-range water level for each spent fuel pool at its site until 5 years have elapsed since all of the fuel within that spent fuel pool was last used in a reactor vessel for power generation. This provision does not apply to General Electric Mark III upper containment pools.

(f) *Documentation of changes.* (1) A licensee may make changes in the implementation of the requirements in this section without NRC approval, provided that before implementing each such change, the licensee demonstrates that the provisions of this section continue to be met and maintains documentation of changes until the

requirements of this section no longer apply.

(2) Changes in the implementation of requirements in this section subject to change control processes in addition to paragraph (f) of this section must be processed via their respective change control processes, unless the changes being evaluated impact only the implementation of the requirements of this section.

(g) *Implementation.* Each holder of an operating license for a nuclear power reactor under this part on September 9, 2019, and each holder of a combined license under part 52 of this chapter for which the Commission made the finding specified in 10 CFR 52.103(g) as 10 CFR 52.103(g) as of September 9, 2019, shall continue to comply with the provisions of paragraph (b)(2) of this section, and shall comply with all other provisions of this section no later than September 9, 2022, for licensees that received NRC Order EA–13–109 or September 9, 2021, for all other applicable licensees.

(h) *Withdrawal of orders and removal of license conditions.* (1) On September 9, 2022, Order EA–12–049, ''Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,'' and Order EA–12–051, ''Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation,'' are withdrawn for each licensee or construction permit holder that was issued those Orders.

(2) On September 9, 2019, Enrico Fermi Nuclear Plant Unit 3, License No. NPF–95, license conditions 2.D(12)(h), ''Reliable Spent Fuel Pool/Buffer Pool Level Instrumentation,'' 2.D(12)(i), ''Emergency Planning Actions,'' and 2.D(12)(g), ''Mitigation Strategies for Beyond-Design-Basis External Events,'' except for 2.D(12)(g)1, are deemed removed from that license.

(3) On September 9, 2019, William States Lee III Nuclear Station, Unit 1, License No. NPF–101, license conditions 2.D(12)(d)11 regarding reliable spent fuel pool instrumentation, 2.D(12)(g), ''Emergency Planning Actions,'' and 2.D(12)(j), ''Mitigation Strategies for Beyond-Design-Basis External Events,'' except for 2.D(12)(j)1, and William States Lee III Nuclear Station, Unit 2, License No. NPF–102, license conditions 2.D(12)(d)11 regarding reliable spent fuel pool instrumentation, 2.D(12)(g), ''Emergency Planning Actions,'' and 2.D(12)(j), ''Mitigation Strategies for Beyond-Design-Basis External Events,'' except for 2.D(12)(j)1, are deemed removed from those licenses.

(4) On September 9, 2019, North Anna Unit 3, License No. NPF–103, license conditions 2.D(12)(g), ''Reliable Spent Fuel Pool/Buffer Pool Level Instrumentation,'' 2.D(12)(h), ''Emergency Planning Actions,'' and 2.D(12)(f), ''Mitigation Strategies for Beyond-Design-Basis External Events,'' except for 2.D(12)(f)1, are deemed removed from the license.

(5) On September 9, 2019, Turkey Point, Unit 6, License No. NPF–104, license conditions 2.D(12)(e)11 regarding reliable spent fuel pool instrumentation, 2.D(12)(g), ''Emergency Planning Actions,'' and 2.D(12)(h), ''Mitigation Strategies for Beyond-Design-Basis External Events,'' except for 2.D(12)(h)1, and Turkey Point, Unit 7, License No. NPF–105, license conditions 2.D(12)(e)11 regarding reliable spent fuel pool instrumentation, 2.D(12)(g), ''Emergency Planning Actions,'' and 2.D(12)(h), ''Mitigation Strategies for Beyond-Design-Basis External Events,'' except for 2.D(12)(h)1, are deemed removed from those licenses.

■ 6. In appendix E to part 50 revise paragraphs IV.F.2.j and VI.3.c to read as follows:

Appendix E to Part 50—Emergency Planning and Preparedness for Production and Utilization Facilities

* * * * *

IV. * * *

F. * * *

2. * * *

j. The exercises conducted under paragraph 2 of this section by nuclear power reactor licensees must provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to implement the principal functional areas of emergency response identified in paragraph 2.b of this section. Each exercise must provide the opportunity for the ERO to demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF, and joint information center. Additionally, in each 8-calendar-year exercise cycle, nuclear power reactor licensees shall vary the content of scenarios during exercises conducted under paragraph 2 of this section to provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to respond to the following scenario elements: hostile action directed at the plant site, no radiological release or an unplanned minimal radiological release that does not require public protective actions, an initial classification of or rapid escalation to a Site Area Emergency or General Emergency, implementation of strategies, procedures, and guidance under § 50.155(b)(2), and integration of offsite resources with onsite response. The licensee shall maintain a record of exercises conducted during each 8-year exercise cycle that documents the content of scenarios used to comply with the requirements of this paragraph. Each licensee shall conduct a hostile action exercise for each of its sites no later than December 31, 2015. The first 8-year exercise cycle for a site will begin in the calendar year in which the first hostile action exercise is conducted. For a site licensed under 10 CFR part 52, the first 8-year exercise cycle begins in the calendar year of the initial exercise required by section IV.F.2.a of this appendix.

* * * * *

VI. * * *

3. * * *

c. In the event of a failure of NRC-supplied equipment, a replacement will be furnished by the NRC for licensee installation.

* * * * *

PART 52—LICENSES, CERTIFICATIONS, AND APPROVALS FOR NUCLEAR POWER PLANTS

■ 7. The authority citation for part 52 continues to read as follows:

Authority: Atomic Energy Act of 1954, secs. 103, 104, 147, 149, 161, 181, 182, 183, 185, 186, 189, 223, 234 (42 U.S.C. 2133, 2134, 2167, 2169, 2201, 2231, 2232, 2233, 2235, 2236, 2239, 2273, 2282); Energy Reorganization Act of 1974, secs. 201, 202, 206, 211 (42 U.S.C. 5841, 5842, 5846, 5851); 44 U.S.C. 3504 note.

■ 8. In § 52.80, revise paragraph (d) to read as follows:

§ 52.80 Contents of applications; additional technical information.

* * * * *

(d) The applicant's plans for implementing the requirements of § 50.155 of this chapter including a schedule for achieving full compliance with these requirements, and a description of the equipment upon which the strategies and guidelines required by § 50.155(b)(1) of this chapter rely, including the planned locations of the equipment and how the equipment meets the requirements of § 50.155(c) of this chapter.

Dated at Rockville, Maryland, this 30th day of July, 2019.

For the Nuclear Regulatory Commission.

Annette L. Vietti-Cook,

Secretary of the Commission.

The following will not appear in the Code of Federal Regulations:

Views of the Commission

Following the Fukushima Dai-ichi accident in Japan, the NRC embarked on a program of work that has taken eight years and involved a wide variety of people from the agency, from the regulated industry and from our interested stakeholders. The Commission's action on this final rule provides a holistic conclusion to a large portion of this work, which has already resulted in undeniable safety improvements throughout the operating power reactor fleet in the United States. Other work continues outside of the

rulemaking context; there is some analysis to determine whether additional safety improvements are appropriate and further evaluation is ongoing of the actual risk posed by external hazards needed to make such determinations. This work is being performed and will continue in the disciplined, site-specific processes that are in use and are appropriate for resolving these issues. The Commission's action on the final rule does not undermine, stop, or modify these risk-informed, site-specific activities.

As our colleagues note, the final rule omits many provisions of the draft final rule; we did not arrive at this result lightly. Rather, as discussed in our votes and fully explained over the course of the lengthy revisions to this document, after carefully considering whether imposition of the underlying requirements would comply with our existing regulations, specifically the Backfit Rule in 10 CFR 50.109, we supported only those provisions for which such compliance was substantiated by the staff's analysis in the decision record. In that consideration, we primarily analyzed whether the new requirements were necessary for adequate protection or provided a cost-justified, substantial safety benefit. In general, we concluded that the requirements already imposed by the Commission by the Mitigation Strategies Order following the Fukushima Dai-ichi accident are sufficient and no new information in the record before us, including information developed by the staff or submitted by the public, indicates otherwise.

Our colleagues also claim that the Staff Requirements Memorandum (SRM) on COMSECY–14–0037, ''Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards,'' established that it is necessary that the mitigation strategies under this final rule address the reevaluated seismic and flooding hazards to ensure adequate protection of public health and safety. To the extent our colleagues suggest that SRM–COMSECY–14–0037 redefined the requirements needed for adequate protection stated in the March 2012 Mitigation Strategies Order, that suggestion is inconsistent with the agency's long standing practice and with applicable procedural and safety requirements.

Staff Requirements Memoranda provide direction to the agency staff from the Commission and are not appropriate vehicles for imposing requirements on licensees and applicants. Under the Administrative Procedure Act, such vehicles are generally regulations and orders. Subsequent to COMSECY–14–0037, neither the Commission nor the staff undertook any additional action to modify and re-issue the March 2012 Mitigation Strategies Order or to issue a new order as was done for the hardened containment venting system orders when the NRC concluded venting systems should be capable of use in a severe accident. It would be inappropriate and without precedent for the agency to establish with finality what is required of our licensees in a process lacking either the hearing rights of our process for issuing orders or the public notice and comment of our deliberative rulemaking process.

Moreover, our colleagues' suggestion regarding adequate protection finds no support within the four corners of the SRM. As noted in our underlying votes, seeking clear direction within the plain text of that document is difficult. The SRM did not approve the entirety of the staff's planned approach and in our view should not be read to approve the staff's bases for their plan. Indeed, COMSECY–14–0037 itself did not address the issue of the reevaluation of seismic hazards.

Most importantly, the assertion that the Commission made an adequate protection determination in its action on COMSECY–14–0037 is inconsistent with the Commission's conduct in the wake of the issuance of the SRM. Under long-standing agency policy, when the NRC identifies a need to impose a new or revised requirement to maintain a reasonable assurance of adequate protection, the agency must next determine whether an ''imminent threat'' to public health and safety exists. If so, the agency must implement the requirement immediately. In this case, the record surrounding SRM–COMSECY–14–0037 does not contain any evidence that the Commission or staff conducted such an imminent threat assessment. The lack of such an assessment severely undercuts any suggestion that the SRM somehow expanded the requirements in our March 2012 Mitigation Strategies Order to maintain a reasonable assurance of adequate protection.

Moreover, to the extent our colleagues observe that SRM–COMSECY–14–0037 directed the staff to include certain provisions in a draft rule, the absence of those provisions in the final rule is not surprising or problematic. Rather, this absence is a normal part of the rulemaking process. As the Supreme Court has observed, ''Since [a] proposed rule [is] simply a proposal, its presence mean[s] that the [regulator is] *considering* the matter; after that consideration the [regulator] might choose to adopt the proposal or to withdraw it'' *Long Island Care at Home, Ltd.* v. *Coke,* 551 U.S. 158, 175 (2007) (emphasis in the original). We certainly have the option, as we have exercised here, to adopt certain aspects of a proposal and to reject others.

Our colleagues appear to suggest that we are ignoring the actual flooding and earthquake hazards that our licensees have determined could occur at our nation's nuclear power plants. This is not the case; we are simply choosing to complete the Commission-directed site-specific process already underway rather than to enact additional requirements on a generic basis. The hazard reevaluations conducted by licensees at the Commission's request under 10 CFR 50.54(f) have been developed using the best available methods for siting nuclear power plants and include conservative assumptions and margin sufficient to show that the reevaluated hazards will not affect the plants. Work continues on the assessment of the results of these reevaluations to determine just what the actual hazards to the plants are on a site-specific basis. To facilitate these assessments, the Commission specifically directed the staff, in the course of determining what regulatory actions are appropriate, to ''introduce more realism for the purpose of identifying potential safety enhancements for operating reactors'' (SRM–COMSECY–14–0037) and ''continue to look for additional opportunities to address any over conservatism in the flood hazard evaluations and to streamline the process as additional lessons are learned'' (SRM–COMSECY–15–0019). The staff continues to make good progress in this area as it completes its work under § 50.54(f) to determine whether individual licenses ''should be modified, suspended, or revoked.'' These efforts are, in our view, sufficient to provide reasonable assurance of adequate protection at each facility.

Finally, our colleagues note the lack of specific requirements in this final rule for items that have already been resolved in the nuclear industry's response to the Mitigation Strategies Order. This is, however, in keeping with our regulatory processes. Our Backfit Rule itself provides that ''[i]f there are two or more ways to achieve compliance with a license or the rules or orders of the Commission, or with written licensee commitments, or there are two or more ways to reach a level of protection which is adequate, then ordinarily the applicant or licensee is free to choose the way which best suits its purposes'' (10 CFR 50.109(a)(7)). Although we may certainly constrain the manner in which applicants or licensees develop their mitigation strategies to comply with this final rule, we will not do so absent a sufficiently documented basis. We have not been provided in the record before us—or anywhere else—a basis for artificially constraining the means and methods of future compliance as our colleagues would have us do. We have confidence that all of the nation's currently operating power reactors are capable of complying with the requirements of this final rule using industry-developed and NRC-approved guidance because they have been able to achieve compliance with the Mitigation Strategies Order, which is made generically applicable by this Commission action.

Chairman Kristine L. Svinicki,
Commissioners Annie Caputo and David A. Wright

Separate Views of Commissioner Baran

This rule was meant to be the capstone of the agency's response to the Fukushima Dai-ichi accident in Japan. The draft final rule presented to the Commission by the NRC staff in December 2016 was the culmination of years of work to establish new requirements for the mitigation of beyond-design-basis events at nuclear power plants. The draft final rule would have responded to Near-Term Task Force (NTTF) recommendations 2 and 4 by requiring licensee strategies to mitigate beyond-design-basis events to address each plant's re-evaluated seismic and flooding hazards. The rule also would have responded to NTTF recommendations 8 and 9 by requiring an integrated emergency response capability and ''sufficient staffing, command and control, training, drills, communications capability, and documentation of changes to support the integrated response capability.'' To address NTTF recommendations 10 and 11, the rule

would have set requirements for enhanced onsite emergency response capabilities.

I strongly support requiring these updated standards and critical safety improvements, which are necessary to provide adequate protection of public health and safety. But the majority of the Commission has decided to gut this key post-Fukushima safety rule.

In the aftermath of Fukushima, licensees and the NRC staff spent years using the latest science and modern methods to determine the present-day flooding and earthquake hazards for the nation's nuclear power plants. Now, the majority of the Commission has decided that licensees can ignore these reevaluated hazards with their strategies to mitigate beyond-design-basis events. Instead of requiring nuclear power plants to be prepared for the actual flooding and earthquake hazards that could occur at their sites, NRC will allow them to be prepared only for the old, outdated hazards typically calculated decades ago when the science of seismology and hydrology was far less advanced than it is today. This decision is nonsensical.

The requirement for licensees to develop and maintain mitigating strategies for beyond-design-basis events based on the modern, reevaluated hazards was at the core of this rulemaking, and the majority of the Commission has voted to jettison it. Under the final rule written by the majority, the FLEX equipment at nuclear power plants is not required to be reasonably protected from the up-to-date flooding and earthquake hazards. Other vital safety protections were completely excised from the rule. Licensees will not be required to have sufficient staffing or communications capabilities to implement the mitigating strategies. And there will be no requirement for drills and exercises to test licensees' ability to respond to these kinds of extreme events. Instead of establishing these commonsense and non-controversial safety standards, the majority of the Commission has opted to require only what was already required in the Commission's March 2012 Mitigation Strategies Order. That order was supposed to be a first step towards improved safety, not the last. But the majority's version of this rule does nothing to enhance the safety of nuclear power plants.

This outcome is a complete U-turn for NRC. In the 2012 order, the Commission made it clear that mitigating strategies for beyond-design-basis events were necessary to ensure adequate protection of public health and safety. The Commission did not require the mitigating strategies to account for the reevaluated hazards at that time because the seismic and flooding analyses had not yet been performed. But the NRC staff clearly understood that the mitigating strategies would ultimately need to address the reevaluated hazards. In 2014, the staff recommended that ''licensees' mitigating strategies address the reevaluated flooding hazards as part of the [mitigating beyond-design-basis-events] rulemaking.'' [5] The Commission unanimously approved that recommendation.[6] As a result, the proposed rule was written to ''resolve and clarify the necessary actions a licensee must take to continue to show adequate protection of public health and safety, in light of the reevaluated hazards.'' [7] This central aspect of the proposed rule was likewise unanimously approved by the Commission. In the comments submitted on the proposed rule, no stakeholder disagreed that these requirements should be included in the rule or disputed that they were necessary for adequate protection of public health and safety. Thus, the majority of the Commission has now voted for a final rule that bears no resemblance to the proposed rule or any of the public comments submitted to the agency in response to the proposed rule. Despite the fact that the Commission had repeatedly and unanimously found that updated safety standards were necessary to adequately protect the public, those safety standards have now been abruptly dropped from the final rule at the last minute, without any warning or notice to stakeholders.

The guidance that has been developed by the NRC staff and industry was intended to facilitate compliance with the requirements included in the draft final rule. Licensees have been preparing for years to implement mitigating strategies that account for the reevaluated flooding and earthquake hazards at nuclear power plant sites. This guidance is not a substitute for a regulation. It is not a legally binding requirement.

This rule was always intended to be the agency's response to several key Near-Term Task Force recommendations. Instead of following through on these planned safety improvements, critical aspects of those recommendations to enhance mitigation and strengthen emergency preparedness are simply left unaddressed. As a result, the rule fails to confront a fundamental lesson of the Fukushima accident—that nuclear power plants must be fully prepared for the natural hazards that could threaten their safe operation. The majority of the Commission has chosen to leave this important safety work for a future Commission. The unfortunate reality is that this hollow shell of a rule does nothing beyond what the Commission already did more than six years ago. Nuclear power plants will be no safer with this rule than they are today.

Separate Views of Commissioner Burns

The version of the final rule supported by the majority of the Commission will, in my view, significantly weaken what will be the agency's most enduring action as a result of lessons learned from the Fukushima Daiichi accident. In doing so, the Commission will have systematically and inexplicably unraveled a framework for addressing beyond-design-basis external events carefully crafted as a collaborative effort between the NRC staff and our external stakeholders in the years since the accident occurred in March 2011.

I am chiefly concerned with the position the Commission majority has taken with respect to the reevaluated hazard analyses performed by licensees. This position is particularly disconcerting given that the accident at Fukushima was a direct result of the operator and regulator failing to take action to account for new scientific knowledge related to natural hazards, especially flooding hazards. In this regard, I believe that the majority has undermined the Commission's past position on these issues. In their edits to the statements of consideration for the final rule as well as to the supporting backfitting assessment, the majority has mischaracterized the Commission decision on COMSECY–14–0037. In its March 2015 Staff Requirements Memorandum on COMSECY–14–0037, the Commission approved the staff's recommendation ''that licensees for operating nuclear power plants need to address the reevaluated flooding hazards within their mitigation strategies for beyond-design-basis external events.'' The staff was explicit in COMSECY–14–0037 about what it was asking of the Commission:

The NRC staff is asking the Commission to support the planned approach by affirming that the MBDBE rulemaking needs to require mitigating strategies that are able to address the reevaluated flooding hazards developed in response to the § 50.54(f) letters *in order to ensure reasonable assurance of adequate protection of the public health and safety.* (emphasis added)

The staff followed the Commission's unequivocal direction when it presented the proposed rulemaking on the Mitigation of Beyond-Design Basis Events to the Commission in April 2015. In the draft proposed rule, the staff clearly stated that the proposed rulemaking would apply to power reactor applicants and licensees and include proposed ''requirements for the reasonable protection of mitigation equipment for beyond-design-basis external events that reflect the reevaluated hazards determined through regulatory efforts stemming from the 10 CFR 50.54(f) request issued on March 12, 2012.'' In the Commission paper transmitting the proposed rule (SECY–15–0065), the staff highlighted the fact that the proposed rule would ''resolve and clarify the necessary actions a licensee must take to continue to show adequate protection of public health and safety, in light of the reevaluated hazards, as directed in SRM–COMSECY–14–0037.'' The Commission unanimously approved publication of the draft proposed rule and noted only two exceptions it was taking to the staff's proposals, neither of which involved the need for mitigation strategies to reflect the reevaluated hazards.

We should recall that, in the SRM for SECY–11–0124, ''Recommended Actions to

[5] COMSECY–14–0037 at 6–7. There was no ambiguity on this point. The staff paper also stated: ''The NRC staff is asking the Commission to support the planned approach by affirming that the MBDBE rulemaking needs to require mitigating strategies that are able to address the reevaluated flooding hazards developed in response to the § 50.54(f) letters in order to ensure reasonable assurance of adequate protection of the public health and safety.'' *Id.* at 7. The paper further stated: ''The results of the reevaluation of the flooding hazard are important to define the necessary attributes of the mitigating strategies equipment and actions to adequately protect against external events. The NRC staff plans to include this requirement in the pending MBDBE rulemaking. As such, the strategies required by the MBDBE rulemaking cannot be completed without information about the site-specific reevaluated flooding hazards.'' *Id.* at 6.

[6] Staff Requirements Memorandum for COMSECY–14–0037.

[7] SECY–15–0065 at 7. *See also* Proposed Rule Draft **Federal Register** Notice at 22, 69, 71, 102, 118–119, 124–125.

be Taken Without Delay from the Near-Term Task Force Report,'' the Commission approved the staff's intent to issue a request for information to all operating reactor licensees to address, among other things, reevaluations of seismic and flooding hazards in accordance with Near-Term Task Force (NTTF) Recommendation 2.1. The request for information, issued under the provisions of 10 CFR 50.54(f) on March 12, 2012, (§ 50.54(f) letter) stated that the hazard evaluation developed consistent with Recommendation 2.1 would be implemented in two phases. The first phase involved the reevaluation of the seismic and flooding hazards at all sites. In the second phase, the NRC staff was to determine, based upon the results of Phase 1, whether additional regulatory actions were necessary (*e.g.,* updating the design basis and SSCs important to safety) to provide additional protection against the updated hazards.

As former Commissioner Apostolakis pointed out in his 2011 vote on the NTTF Report, ''there is growing evidence that the historical record of tsunamis had not been used properly to determine the design basis at Fukushima Daiichi and, consequently, the protection of the plants was not sufficient.'' In the United States, there exists incontrovertible evidence that the current design bases for some plants do not address a flood hazard identified by the licensees' own analyses. Had the final rule been approved as proposed by the staff, the Commission's carefully crafted strategy would have dealt with this situation appropriately and effectively by requiring that the mitigation strategies for all sites be able to address the reevaluated hazards developed in response to the § 50.54(f) letters as a matter of adequate protection of the public health and safety. For plants with the most extreme exceedances from their current design basis, additional actions may have been necessary, but those decisions would only be made once their final flooding and/or seismic evaluations (*e.g.,* integrated assessments or seismic PRAs) were completed. Absent a requirement in the MBDBE final rule to protect the mitigation strategies from the reevaluated hazard, the process for closing out NTTF Recommendation 2.1 and the § 50.54(f) letter for all plants will be made much more burdensome for both licensees and the NRC staff and the outcome with respect to protecting plants from beyond-design-basis external events much more uncertain.

In addition, the majority's approach calls into question the degree to which the NRC will be able to give credit for the existence of the mitigation strategies in a number of risk-informed regulatory initiatives like adaptation of alternative treatment requirements for SSCs under 10 CFR 50.69, ''Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors,'' and risk-informed technical specifications. Licensees are also seeking credit for mitigation strategies in the Reactor Oversight Process and have expressed interest in pursuing credit for use of the strategies in the physical security program. The assessment of the degree to which credit for the mitigation strategies is possible will be much more complex now that the mitigation strategies will not be required to address the reevaluated hazards.

Moreover, the decision to strip out the draft final rule requirements for an integrated response capability, as well as requirements for sufficient staffing levels, means of communication, and drills, also ignores primary lessons from the Fukushima Daiichi accident. These requirements were approved by the Commission in the proposed rule, and nothing has occurred in the interceding years to change the need for these requirements to ensure a holistic approach to the response to beyond-design basis accidents.

The decision of the Commission majority to reverse course now, when the lion's share of the actions that would be required under the rule have already been completed by industry, is baffling. It is difficult to understand how the arguments put forth of regulatory over-reach are defensible with anyone who was at the agency when the accident occurred and has followed the activities of the agency, including the decisions made by the Commission, in the intervening years. It is equally baffling that some in the majority should lay the blame on the shoulders of the NRC staff for the perceived misapplication of the backfit rule when the staff was merely following Commission direction in producing the draft final rule.

I would also point out that the changes reflected in the final rule are troubling in two other respects. First, the changes seem to be based in part on a presumption that the orders developed by staff and approved by the Commission in 2012 were a fully informed and complete regulatory solution to the Fukushima Daiichi accident. I do not mean to suggest that the Commission and the staff didn't implement thoughtful and effective solutions given what was known at the time. However, the orders were approved by the Commission just one year after the accident, and significant gaps still remained in the NRC's and industry's knowledge. To now suggest, as the majority has done, that the NRC could not improve upon the requirements of the orders or address these gaps in knowledge through this rulemaking makes little sense. I am also troubled that the final rule eliminates a substantial number of requirements that were included in the proposed rule for which no adverse public comments were received.

Finally, although I have long supported the NRC's pursuit of a rigorous application of its backfitting regulations and adherence to its Principles of Good Regulation, this pursuit must be rational. In defense of this rulemaking proposal, the staff produced appropriate backfitting and regulatory analyses, which were consistent with previous Commission direction. The majority has decided to reverse these previous Commission decisions and takes issue with the staff's supporting analysis based on little more than conclusory statements in Commission votes that some of the requirements in the draft final rule are not ''necessary'' or would not result in a ''substantial increase in the overall protection of the public health and safety.'' Such an approach is entirely inconsistent with the principles of clarity, reliability, and openness that are supposed to drive this agency's work.

In the official report of the National Diet of Japan's Fukushima Nuclear Accident Independent Investigation Commission, Chairman Kiyoshi Kurokawa noted:

The earthquake and tsunami of March 11, 2011 were natural disasters of a magnitude that shocked the entire world. Although triggered by these cataclysmic events, the subsequent accident at the Fukushima Daiichi Nuclear Power Plant cannot be regarded as a natural disaster. It was a profoundly manmade disaster—that could and should have been foreseen and prevented. And its effects could have been mitigated by a more effective human response.

The issuance of the NRC's final rule was meant to be the culmination of the agency's efforts to learn the lessons of the Fukushima Daiichi accident. Given the final form of the rule approved by the Commission majority, it will be difficult to convince others that the agency has learned those lessons well.

[FR Doc. 2019–16600 Filed 8–8–19; 8:45 am]

BILLING CODE 7590–01–P