



## **NSIR/DPR-ISG-02**

### **INTERIM STAFF GUIDANCE**

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# **EMERGENCY PLANNING EXEMPTION REQUESTS FOR DECOMMISSIONING NUCLEAR POWER PLANTS**

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## 1.0 PURPOSE

This interim staff guidance (ISG) provides guidance to U.S. Nuclear Regulatory Commission (NRC) staff for conducting the technical review of requests for exemptions from the emergency preparedness (EP) requirements for nuclear power reactors that have been permanently shut down and defueled or are planning to transition to a decommissioning state. Guidance for the staff's review of associated changes to the licensee's emergency plan reflecting the EP exemptions, as granted, and based on the reactor's permanently shutdown and defueled condition, is also provided in this ISG.

Licensees must follow the process outlined in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," Section 50.12, "Specific Exemptions," when applying for exemptions from Part 50 EP regulations.

Table 1, "Exemptions for Consideration," of this ISG should be considered by the staff as one acceptable means for reviewing the adequacy of the licensee's request for exemptions from portions of 10 CFR 50.47, "Emergency Plans," and Appendix E to 10 CFR Part 50, "Emergency Planning and Preparedness for Production and Utilization Facilities," submitted for NRC approval under 10 CFR 50.12.

Staff requirements memorandum (SRM) to SECY-08-0024 requires Commission approval for any reduction in the effectiveness of a licensee's emergency plan that requires an exemption from the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. SECY-14-0066 provides an example format to make this request to the Commission.

Each licensee must evaluate, under 10 CFR 50.54(q), changes to its emergency plan that implements proposed exemptions that reflect the plant's permanently shut down and defueled condition to assess whether the changed plan, referred to hereafter as the permanently defueled emergency plan (PDEP), constitutes a reduction in effectiveness. Attachment 1, "Staff Guidance for Evaluation of Permanently Defueled Emergency Plans," of this ISG should be used by the staff as an acceptable means for reviewing the adequacy of the licensee's PDEP submitted for NRC approval under 10 CFR 50.90, "Application for Amendment of License, Construction Permit or Early Site Permit."

Changes to a licensee's emergency action levels (EALs) to reflect the permanently shut down and defueled condition of the reactor, should be considered a scheme change per Section IV.B.2 of Appendix E to 10 CFR Part 50. The Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors" (Reference 1), should be used by staff as an acceptable means for reviewing the adequacy of EAL scheme changes for permanently shut down and defueled power reactors.

## 2.0 SCOPE

This ISG is applicable to a nuclear power reactor licensee that has: (1) notified the NRC of its intent to permanently cease operation and to permanently remove fuel from the reactor vessel; (2) fuel currently in "wet" storage onsite in a spent fuel pool (SFP); and (3) a decommissioning power reactor that is not co-located on the site of an operating power reactor. If a nuclear power reactor designated to undergo decommissioning is co-located on the site of an operating nuclear power reactor, the NRC anticipates that the licensee will make changes to the site emergency plan, but requests for exemptions from emergency planning regulations are not expected because the operating unit licensee will have to maintain its current level of

emergency preparedness. As the licensee transitions through the decommission process, it is expected that the spent fuel will be transferred into a dry cask storage system. The licensee will make changes to its emergency plan to reflect the dry cask storage, if not previously done. After this transfer is completed the licensee may consider change its emergency plan to reflect the dry cask system only. This ISG does not provide that guidance. The Office of Nuclear Materials Safeguards and Security Spent Fuel Project Office Interim Staff Guidance – 16, “Emergency Planning,” provides the appropriate guidance for fuel stored in a dry cask storage facility consistent with the EP requirements in 10 CFR 72.32, “Emergency Plan.” It is recommended that the licensee discuss these changes with the staff prior to implementation.

The ISG reflects only exemptions from regulations that have been approved previously for decommissioning power reactors. The ISG provides in Table 1, “Exemptions for Consideration,” the criteria and process used most recently by NRC staff in its evaluation of exemptions from EP regulations in SECY-14-0066, “Request By Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements” (Reference 2) and SECY-14-0118, “Request By Duke Energy Florida, Inc. for Exemptions from Certain Emergency Planning Requirements” (Reference 3), as approved by the Commission in Staff Requirements Memoranda dated August 7, 2014, (Reference 4), and December 30, 2014, (Reference 5), respectively.

### **3.0 BACKGROUND**

The purposes of the EP requirements in 10 CFR 50.47 and Appendix E to 10 CFR Part 50 are to ensure that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, establish plume exposure and ingestion pathway emergency planning zones (EPZs) for nuclear power plants, and ensure that licensees maintain effective offsite and onsite emergency plans, with the cooperation and assistance of State and local authorities. These requirements continue to apply to a nuclear power reactor licensee after permanent cessation of operations and permanent removal of fuel from the reactor vessel. There are no explicit regulatory provisions distinguishing EP requirements for a power reactor that has been shut down from those for an operating power reactor.

The regulations in 10 CFR 50.12(a)(2)(ii) provide that the NRC may, on application by a licensee or on its own initiative, grant exemptions from the requirements of the Part 50 regulations in circumstances in which application of the regulation would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule<sup>1</sup>.

The risk of an offsite radiological release is significantly lower, and the types of possible accidents are significantly fewer, at a nuclear power reactor that has permanently ceased operations and removed fuel from the reactor vessel, than at an operating power reactor. The NRC has previously granted exemptions from EP requirements for permanently shut down and defueled power reactor licensees. For the Trojan Nuclear Power Plant, Connecticut Yankee Nuclear Power Plant, Maine Yankee Nuclear Power Plant, Big Rock Point Nuclear Power Plant and Zion Nuclear Power Station, the technical basis for the approvals of the exemptions was

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<sup>1</sup> Notwithstanding the special circumstances of the exemption request, 10 CFR 50.12(a)(1) requires that the exemption must be authorized by law, not present an undue risk to the public health and safety, and be consistent with the common defense and security.

based on demonstrating that: (1) the radiological consequences of remaining applicable design-basis accidents (DBAs) would not exceed the limits of the U.S. Environmental Protection Agency's (EPA) Protective Action Guidelines (PAGs) at the exclusion area boundary (EAB); and (2) based on site-specific analysis, the fuel stored in the SFP would not reach the zirconium ignition temperature in fewer than 10 hours from the time at which the licensee assumed a loss of both water and air cooling of the spent fuel. The staff concluded that if a minimum of 10 hours was available to initiate mitigative actions or, if needed, for offsite authorities to implement protective actions using a comprehensive emergency management plan<sup>2</sup> (CEMP) approach, formal offsite radiological emergency plans, required under 10 CFR Part 50, are not necessary for permanently shutdown and defueled nuclear power reactor licensees.<sup>3</sup> More recently, requests for exemptions from specific EP requirements have been granted for Kewaunee Power Station and Crystal River Unit 3. In addition to the analyses described above, the technical basis for approving these requests also included demonstrations that adequate security remains to protect the spent fuel and that adequate mitigation strategies can be performed by the on-site staff.

The NRC requires a level of licensee EP commensurate with the risk to public health and safety, and common defense and security at the licensee's site. Under the safety analysis in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," (Reference 6), the event sequences important to risk at a decommissioning power reactor are limited to a large earthquake and cask-drop events. This is an important difference relative to an operating power reactor where typically a large number of different initiating events make significant contributions to risk. Additionally, physical security for special nuclear material at fixed sites, including decommissioning power reactors, is required by 10 CFR Part 73, "Physical Protection of Plants and Materials." Decommissioning power reactor licensees are required by 10 CFR 73.55(f) to develop target sets for use in the development and implementation of security strategies that protect against spent fuel sabotage. While both operating and decommissioning power reactors are required to develop target sets, the number of target sets at a decommissioning reactor is significantly reduced. Implementation of the protective strategy at a decommissioning reactor takes into account this reduction in target sets. With the significant reduction in radiological risk for a power reactor undergoing decommissioning, the NRC has historically approved exemptions to EP and security requirements based on site-specific justifications by licensees as well as consideration of the objectives of the regulations.

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<sup>2</sup> A comprehensive emergency management plan in this context, also referred to as an emergency operations plan (EOP), is addressed in the Federal Emergency Management Agency's (FEMA) Comprehensive Preparedness Guide (CPG) 101, "Developing and Maintaining Emergency Operations Plans". CPG 101 is the foundation for State, territorial, tribal, and local emergency planning in the United States. It promotes a common understanding of the fundamentals of risk-informed planning and decisionmaking and helps planners at all levels of government in their efforts to develop and maintain viable, all-hazards, all-threats emergency plans. An EOP is flexible enough for use in all emergencies. It describes how people and property will be protected; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies, and other resources available; and outlines how all actions will be coordinated. A CEMP is often referred to as a synonym for "all hazards planning."

<sup>3</sup> Individual States and local governments have the primary authority and responsibility to protect their citizens and respond to disasters and emergencies. An exemption, if issued, could create a transitional environment for off-site emergency planners in how they consider radiological hazards. The resources available to support State and local governments during the transition process include, but are not limited to, the National Preparedness System guidance materials (see footnote 2), the Federal Radiological Preparedness Coordinating Committee, and assistance from FEMA headquarters and regional staff.

Attachment 2, "Previously Approved Licensing Actions," provides a listing of decommissioning power reactors and the bases provided in support of reducing EP requirements in 10 CFR Part 50, specifically the elimination of formal offsite radiological emergency plans.

#### **4.0 OVERVIEW OF EXISTING GUIDANCE**

In August 1997, the NRC published NUREG/CR-6451, "A Safety and Regulatory Assessment of Generic Boiling Water Reactor (BWR) and Pressurized Water Reactor (PWR) Permanently Shutdown Nuclear Power Plants," (Reference 7) which provided recommendations on operationally-based regulations that could be partially or totally removed for decommissioning power reactor licensees without impacting public health and safety. It recommended that licensees apply for exemptions from the following offsite EP requirements, after the fuel is no longer susceptible to substantial zircaloy oxidation and the fuel cladding will remain intact given the SFP is drained:

- early public notification (§50.47(b)(5) and Appendix E, Section IV.D.3);
- the periodic dissemination of emergency planning information to the public (§50.47(b)(7) and Appendix E, Section IV.E.8);
- offsite emergency facilities and equipment such as the Emergency Operations Facility and the emergency news center (§50.47(b)(8), Appendix E, Section IV.E.8);
- offsite radiological assessment and monitoring capability, including field monitoring teams (§50.47(b)(9));
- periodic offsite drills and exercises (§50.47(b)(14), Appendix E, Section IV.F.3); and
- licensee headquarters support personnel training (§50.47(b)(15), Appendix E, Section IV.F.b.viii).

The underlying technical basis for exemptions granted for licensees undergoing decommissioning in the late 1990s was a case by case demonstration that: (1) the radiological consequences of applicable DBAs would not exceed the limits of the EPA PAGs at the EAB; and (2) the spent fuel stored in the SFP would not reach the zirconium ignition temperature in fewer than 10 hours starting from the time at which the licensee assumed a loss of both water and air cooling of the spent fuel (referred to as an adiabatic heat-up). The staff concluded that if a minimum of 10 hours was available to initiate mitigative actions, or if needed, for offsite authorities to implement protective actions using a CEMP approach, formal offsite radiological emergency plans, required under 10 CFR Part 50, are not necessary for permanently shut down and defueled power reactor licensees.

The 10 hour time period is based on a heat-up calculation which uses several simplifying assumptions (adiabatic conditions). Some of these assumptions are conservative (e.g., simplified treatment of the thermal-hydraulic response), while others are nonconservative (e.g., no oxidation below 900 degrees Celsius). Weighing the conservatisms and nonconservatisms, the staff judges that this calculation reasonably represents conditions that may occur in the event of an SFP accident involving the loss of water inventory. In an example of a more mechanistic calculation, NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling-Water Reactor" (Reference 8), considered various cooling mechanisms as well as additional heat from oxidation. The study found that a release is not expected to occur at the operating power reactor site studied for at least 72 hours following a beyond design-basis seismic event that occurs more than 60 days after shutdown.

In a hypothetical spent fuel pool accident scenario, 10 hours is not the expected amount of time it would take for water to drain from the pool. A beyond design-basis accident that results in the water draining from the pool (whether a full or partial drain-down) would likely take much longer than 10 hours because of the robust construction of the spent fuel pool and the large volume of water in the pool. The 10-hour time period is also not intended to represent the time that it would take to repair all key safety systems or to repair a large SFP breach. Considering the very low probability of beyond-design-basis events affecting the SFP, a minimum of 10 hours provides a reasonable time period to implement pre-planned mitigation measures to provide makeup or spray to the SFP before the onset of a zirconium cladding ignition and, if a release is projected to occur, there is sufficient time for offsite agencies to take protective actions using a CEMP to protect the health and safety of the public.

In January 2001, the NRC published NUREG-1738 as the technical basis for the decommissioning rulemaking for permanently shut down nuclear power plants proposed in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning" (Reference 9). NUREG-1738 contained the results of the staff's evaluation of the potential accident risk for a SFP at a decommissioning power reactor in the United States. Specifically, NUREG-1738 stated that fuel assembly geometry and rack configuration are plant specific, and both are subject to unpredictable changes after an earthquake or cask drop that drains the pool. Therefore, because a non-negligible decay heat source lasts many years and configurations ensuring sufficient air flow for cooling cannot be assured, the possibility of reaching the zirconium ignition temperature cannot be precluded on a generic basis.

NUREG-1738 identified a zirconium cladding fire resulting from a substantial loss-of-water from the SFP as the only postulated scenario at a decommissioning power reactor that could result in a significant radiological release. While unlikely, the consequences of such an accident could lead to an offsite dose in excess of the EPA PAGs. Based on spent fuel storage design characteristics and operating practices considered in the analysis, the scenarios that lead to this condition have very low probabilities of occurrence. Accordingly, these scenarios are considered beyond the facility design basis. Furthermore, as the spent fuel ages, the generation of decay heat decreases. After a certain amount of time, the overall threat of a zirconium fire becomes extremely low because of two factors: (1) the large amount of time available for preventative and mitigating actions; and (2) the increased probability that the decay heat will be low enough that the fuel will be air-coolable in the post-event configuration. This lower risk supports the reduction of EP requirements as described in Table 1 of this ISG.

The staff recognizes that at the time the exemption is granted, the risk of a significant offsite radiological release at a decommissioning power reactor storing irradiated fuel in the SFP is lower than the risk from an operating power reactor and its SFP. This is based on the consideration of initiating reactor events associated with normal and abnormal operations, DBAs and certain beyond DBAs applicable to a decommissioning site. In NUREG-1738, the staff found that the event sequences important to risk at decommissioning plants are limited to large earthquakes and cask drop events. For EP assessments, this is an important difference relative to operating power reactors where typically a large number of different sequences make significant contributions to risk. Relaxation of offsite EP a few months after shutdown resulted in only a small change in risk. In NUREG-1738, the NRC also stated, "for comparison, at operating reactors additional risk-significant accidents for which EP is expected to provide dose savings occurs on the order of  $1 \times 10^{-5}$  times per year, while for decommissioning facilities, the largest contributor for which EP would provide dose savings occurs about two orders of magnitude less frequent (cask drop sequence at  $2 \times 10^{-7}$  per year)" and "consistent with

[probabilistic risk assessment] limitations and practice, contributions to risk from safeguards events are not included in these frequency estimates.”

As stated in NUREG-1738, due to the expected state of infrastructure in the event of earthquakes of the magnitude to damage SFPs, EP is not considered to provide significant dose savings in those scenarios.

Because of the lower comparative risk from a decommissioning power reactor, licensees typically request an exemption from certain EP regulations on the basis that those regulations in the particular circumstance are not necessary to achieve the underlying purpose of the EP regulations.

In SECY-01-0100, “Policy Issues Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools” (Reference 10), the staff concluded that there was no immediate safety concern or need for immediate regulatory action for existing decommissioning power reactor licensees that had been previously granted EP exemptions. These conclusions were based on a review of the site-specific conditions at each existing decommissioning plant and the low probability of the beyond-design-basis conditions occurring that would be necessary to initiate a zirconium cladding fire. The staff proposed regulations for maintaining a level of offsite EP consistent with the Commission’s defense-in-depth philosophy while utilizing the risk insights of NUREG-1738. However, in a memorandum from the Executive Director for Operations to the Commission dated August 16, 2002 (Reference 11), the staff notified the Commission that it had discontinued the integrated rulemaking for decommissioning power reactors and generic regulatory activities because of the apparent lack of future licensees that would benefit from such regulations at that time and the need to devote resources to security related issues because of the events of September 11, 2001. Additionally, the staff provided that if any operating power reactors were to shutdown permanently, decommissioning regulatory issues would continue to be addressed on an ad hoc basis through the exemption process in a manner based on the then-current practice.

In 2013, the NRC completed the “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor,” which was subsequently published as NUREG-2161 (Reference 8). The purpose of this study was to determine if accelerated transfer of older, cooler spent fuel from the SFP at a reference plant to dry cask storage would significantly reduce risks to public health and safety. The specific reference plant used for this study was a General Electric Type 4 BWR with a Mark I containment. This study presented a detailed analysis using state-of-the-art, validated, deterministic methods and assumptions, as well as probabilistic insights where practical. Previous studies had shown that earthquakes present the dominant risk for SFPs, so this analysis considered a severe earthquake with ground motion stronger than the maximum earthquake reasonably expected to occur for the reference plant, which would challenge the SFP integrity. The study considered two spent fuel configurations: high-density and low-density loading. The study also analyzed two cases for each scenario: one where mitigation measures of 10 CFR 50.54(hh)(2), the strategies to maintain or restore SFP cooling in the event of loss of large areas of the plant due to fire or explosion, were credited; and one where they were not used or were unsuccessful. The study did not consider the post-Fukushima mitigation measures required by Orders EA-12-049, “Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events” (Reference 12), and EA-12-051, “Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation” (Reference 13). The study results showed that successful mitigation reduces the likelihood of a release and that the



likelihood of a release was equally low for both high- and low-density loading in the SFP. The results of NUREG-2161 are consistent with earlier research conclusions that SFPs are robust structures that are likely to withstand severe earthquakes without leaking.

## **5.0 EVALUATION OF EXEMPTIONS TO EP REGULATIONS**

NRC staff should consider approval for the exemption of EP requirements for decommissioning power reactor licensees in cases where the specific site analyses show that: (1) the radiological consequences of remaining applicable DBAs would not exceed the limits of the EPA PAGs at the EAB; (2) in the event of a beyond design basis event resulting in the partial drain down of the SFP to the point that cooling is not effective, there is at least 10 hours (assuming an adiabatic heatup) from the time that the fuel is no longer being cooled until the hottest fuel assembly reaches 900 degrees Celsius; (3) adequate physical security is in place to assure implementation of security strategies that protect against spent fuel sabotage; and (4) in the unlikely event of a beyond DBA resulting in a loss of all SFP cooling, there is sufficient time to implement pre-planned mitigation measures to provide makeup or spray to the SFP before the onset of a zirconium cladding ignition.

The analyses that are expected to be performed by the licensees and reviewed by NRC staff are:

1. Applicable design DBAs (i.e., fuel handling accident in the spent fuel storage facility, waste gas system release, and cask handling accident if the cask handling system is not licensed as single-failure-proof) (Indicates that any radiological release would not exceed the limits of EPA PAGs at EAB);
2. Complete loss of SFP water inventory with no heat loss (adiabatic heatup) demonstrating a minimum of 10 hours is available before any fuel cladding temperature reaches 900 degrees Celsius from the time all cooling is lost (Demonstrates sufficient time to mitigate events that could lead to a zirconium cladding fire);
3. Loss of SFP water inventory resulting in radiation exposure at the EAB and control room; (Indicates that any release is less than EPA PAGs at EAB); and
4. Considering the site-specific seismic hazard, either an evaluation demonstrating a high confidence of a low-probability (less than  $1 \times 10^{-5}$  per year) of seismic failure of the spent fuel storage pool structure or an analysis demonstrating the fuel has decayed sufficiently that natural air flow in a completely drained pool would maintain peak cladding temperature below 565 degrees Celsius (the point of incipient cladding damage) (Indicates that any release is less than EPA PAGs at EAB).
5. The analyses and conclusions described in NUREG-1738 are predicated on the risk reduction measures identified in the study as Industry Decommissioning Commitments (IDC) and Staff Decommissioning Assumptions (SDA), listed in Tables 4.1-1 and 4.1-2 of that document. The staff should ensure that the licensee has addressed these IDCs and SDAs for the decommissioning site if they are storing fuel in an SFP.
6. Verify that the licensee presents a determination that there is sufficient resources and adequately trained personnel available on-shift to initiate mitigative actions within the 10-

hour minimum time period that will prevent an offsite radiological release that exceeds the EPA PAGs at the EAB.

7. Verify that mitigation strategies are consistent with that required by the Permanently Defueled Technical Specifications or by retained license conditions.

Approval of the request for exemption from certain requirements of 10 CFR 50.47 and Appendix E to Part 50 allows licensees to submit for NRC prior approval a PDEP and a permanently defueled EAL scheme. After approval of the exemption request, the licensee may determine that adoption of a PDEP does not constitute a reduction in effectiveness to the emergency plan per 10 CFR 50.54(q) because of the change in the licensing basis for the plant, and as such, the licensee may opt to implement the change without prior NRC approval. Adoption of permanently defueled EALs is considered to be a scheme change, and per the requirements of Section IV.B.2 to Appendix E of Part 50, shall be submitted as a license amendment request pursuant to 10 CFR 50.90.

Table 1 of this ISG outlines potential exemption requests, based on the Commission's Staff Requirements Memorandum (SRM) dated August 7, 2014 for SECY-14-0066, "Request By Dominion Energy Kewaunee, Inc., for Exemptions from Certain Emergency Planning Requirements." Differences or deviations from Table 1 will be reviewed on a case-by-case basis. Licensees should provide site-specific justification for each requirement requested for exemption. The information in the "Basis for Change" column is provided to NRC reviewers for historical reference and to aid in the review of the information supplied by the licensee.

Table 1

**EXEMPTIONS FOR CONSIDERATION**

**Strikethrough text indicates requested exemptions to rule language.**

10 CFR 50.47 Emergency Plans	Basis for Change
<p>(b) The onsite and, <del>except as provided in paragraph (d) of this section,</del> offsite emergency response plans for nuclear power reactors must meet the following standards:</p>	<p>In the Statement of Considerations (SOCs) for the final rule for EP requirements for independent spent fuel storage installations (ISFSIs) and for monitored retrievable storage installations (MRS) (60 FR 32430; June 22, 1995), the Commission responded to comments concerning offsite emergency planning for ISFSIs or MRS and concluded that, “the offsite consequences of potential accidents at an ISFSI or an MRS would not warrant establishing Emergency Planning Zones [EPZs].”</p> <p>The low likelihood of any credible accident resulting in a radiological release at a decommissioning power reactor, together with the time available to initiate mitigative actions consistent with plant conditions, and if necessary, for offsite authorities to employ their CEMP to take protective actions between the initiating event and before the onset of a postulated fire, obviate the need for formal offsite radiological emergency response plans.</p> <p>In a nuclear power reactor’s permanently defueled state, the accident risks are more similar to an ISFSI or MRS than an operating nuclear power plant. The EP program would be similar to that required for an ISFSI under 10 CFR 72.32(a) when fuel stored in the SFP has more than five years of decay time and would not change substantially when all the fuel is transferred from the SFP to an onsite ISFSI. Exemptions from offsite EP requirements have previously been approved when the site-specific analyses show that in a partial drain-down event, at least 10 hours is available from the time when cooling of the spent fuel is not effective until the hottest fuel assembly reaches 900°C. The technical basis that underlied the approval of the exemption request is based partly on the analysis of a time period that spent fuel stored in the SFP is unlikely to reach the zirconium ignition temperature in less than 10 hours. This time period is based on a heat-up calculation which uses several simplifying assumptions. Some of these assumptions are conservative (adiabatic conditions), while others are non-conservative (no oxidation below 900°C). Weighing the conservatisms and nonconservatisms, the staff judges that this calculation reasonably represents conditions which may occur in the event of an SFP accident.</p> <p>The staff concluded that if 10 hours were available to initiate mitigative actions, or if needed, offsite protective</p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

**Strikethrough text indicates requested exemptions to rule language.**

10 CFR 50.47 Emergency Plans	Basis for Change
	actions using CEMP, formal offsite radiological emergency plans would not be necessary for a permanently defueled nuclear power reactor licensee. As supported by the licensee's SFP analysis, the staff believes an exemption from the requirements for formal offsite radiological emergency plans is justified for a zirconium fire scenario considering the low likelihood of this event together with time available to take mitigative or protective actions between the initiating event and before the onset of a postulated fire.
(1) Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations <del>within the Emergency Planning Zones</del> have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.	Refer to basis for 10 CFR 50.47 (b).
(3) Arrangements for requesting and effectively using assistance resources have been made, <del>arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made,</del> and other organizations capable of augmenting the planned response have been identified.	An Emergency Operations Facility is an offsite location where effective direction and effective control can be exercised in an emergency. Due to the limited radiological consequences associated with postulated events at a permanently shutdown and defueled power reactor and the limited offsite resources considered to be necessary in an emergency at the site, a designated facility to accommodate State and local staff is no longer required. An onsite facility can provide a place for effective direction and effective control in an emergency.  Also refer to basis for 10 CFR 50.47(b).
(4) A standard emergency classification and action level scheme, the basis of which include facility system and effluent parameters, is in use by the nuclear facility licensee, <del>and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.</del>	The NEI document NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors" (Revision 6), was found to be an acceptable method for development of EALs and was endorsed by the NRC in a letter dated March 28, 2013 (ADAMS Accession No. ML12346A463). NEI 99-01 provides EALs for non-passive operating nuclear power reactors, permanently defueled reactors and ISFSIs  Also refer to basis for 10 CFR 50.47(b).
(5) Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow up messages to response organizations <del>and the public has</del>	Refer to basis for 10 CFR 50.47(b).

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

**Strikethrough text indicates requested exemptions to rule language.**

10 CFR 50.47 Emergency Plans	Basis for Change
<del>been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.</del>	
(6) Provisions exist for prompt communications among principal response organizations to emergency personnel <del>and to the public.</del>	Refer to basis for 10 CFR 50.47(b).
<del>(7) Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors); [T]he principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.</del>	Refer to basis for 10 CFR 50.47(b).
(9) Adequate methods, systems, and equipment for assessing and monitoring actual or potential <del>offsite</del> consequences of a radiological emergency condition are in use.	Refer to basis for 10 CFR 50.47(b)
<del>(10) A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.</del>	<p>Licensees are responsible to provide protective actions for any emergency workers that may have to respond to the site for fire, medical and/or law enforcement response. Additionally, the licensee is responsible to protect public health and safety in case of an emergency within the EAB.</p> <p>In the unlikely event of a SFP accident, the iodine isotopes which contribute to an off-site dose from an operating reactor accident are not present, so potassium iodide (KI) distribution off-site would no longer serve as an effective or necessary supplemental protective action.</p> <p>The Commission responded to comments in its SOC for the Final Rule for emergency planning requirements for ISFSIs and MRS facilities (60 FR 32435; June 22, 1995), and concluded that, "the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones." Additionally, in the Statement of Considerations for the Final Rule for EP requirements for ISFSIs and for MRS facilities (60 FR 32430), the Commission responded to comments concerning site-specific emergency planning that includes evacuation of surrounding population for</p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

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10 CFR 50.47 Emergency Plans	Basis for Change
	<p>an ISFSI not at a reactor site, and concluded that, “The Commission does not agree that as a general matter emergency plans for an ISFSI must include evacuation planning.”</p> <p>Because the NRC concludes that evacuation planning is not needed for a decommissioning reactor site that meets the criteria for an exemption from offsite EP requirements as discussed in the exemption from 10 CFR 50.47(b), evacuation time estimates are also not needed.</p>
<p>(c)(2) <del>Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.</del></p>	<p>Refer to basis for 10 CFR 50.47(b)(10).</p>

**Table 1**  
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10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p>1. The applicant's emergency plans shall contain, but not necessarily be limited to, information needed to demonstrate compliance with the elements set forth below, i.e., organization for coping with radiological emergencies, assessment actions, activation of emergency organization, notification procedures, emergency facilities and equipment, training, maintaining emergency preparedness, and recovery, <del>and onsite protective actions during hostile action</del>. In addition, the emergency response plans submitted by an applicant for a nuclear power reactor operating license under this Part, or for an early site permit (as applicable) or combined license under 10 CFR Part 52, shall contain information needed to demonstrate compliance with the standards described in § 50.47(b), and they will be evaluated against those standards.</p>	<p>The EP Final Rule (76 FR 72560; November 23, 2011), amended certain requirements in 10 CFR Part 50. Among the changes, the definition of “hostile action” was added as an act directed toward a nuclear power plant (NPP) or its personnel. This definition is based on the definition of “hostile action” provided in NRC Bulletin 2005-02, “Emergency Preparedness and Response Actions for Security-Based Events.” NRC Bulletin 2005-02 was not applicable to nuclear power reactors that have permanently ceased operations and have certified that fuel has been removed from the reactor vessel.</p> <p>The NRC excluded non-power reactors from the definition of “hostile action” at the time of the rulemaking because, as defined in 10 CFR 50.2, a non-power reactor is not considered a nuclear power reactor and a regulatory basis had not been developed to support the inclusion of non-power reactors in the definition of “hostile action.” Similarly, a decommissioning power reactor or ISFSI is not a “nuclear reactor” as defined in the NRC’s regulations. A decommissioning power reactor also has a low likelihood of a credible accident resulting in radiological releases requiring offsite protective measures. For all of these reasons, the staff concludes that a decommissioning power reactor is not a facility that falls within the definition of “hostile action.”</p> <p>Similarly, for security, risk insights can be used to determine which targets are important to protect against sabotage. A level of security commensurate with the consequences of a sabotage event is required and is evaluated on a site-specific basis. The severity of the consequences declines as fuel ages and, thereby, removes over time the underlying concern that a sabotage attack, under the current definition, could cause offsite radiological consequences.</p> <p>Although, this analysis provides a justification for an exemption to include the definition for a “hostile action” and its related requirements, elements for security-based events would be maintained. The classification of security-based events, notification of offsite authorities and coordination with offsite agencies under a CEMP would still be required. Other security-related requirements in the EP Final Rule would be exempted such as, on-shift staffing analysis, emergency response organization (ERO) augmentation and alternative facilities, protection of onsite personnel, and challenging</p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
	drills and exercises due to the reduced radiological risk for a decommissioning power reactor.
2. This nuclear power reactor license applicant shall also provide an analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations, using the most recent U.S. Census Bureau data as of the date the applicant submits its application to the NRC.	Refer to basis for 10 CFR 50.47(b)(10)
3. Nuclear power reactor licensees shall use NRC approved evacuation time estimates (ETEs) and updates to the ETEs in the formulation of protective action recommendations and shall provide the ETEs and ETE updates to State and local governmental authorities for use in developing offsite protective action strategies.	Refer to basis for 10 CFR 50.47(b)(10).
4. Within 365 days of the later of the date of the availability of the most recent decennial census data from the U.S. Census Bureau or December 23, 2011, nuclear power reactor licensees shall develop an ETE analysis using this decennial data and submit it under § 50.4 to the NRC. These licensees shall submit this ETE analysis to the NRC at least 180 days before using it to form protective action recommendations and providing it to State and local governmental authorities for use in developing offsite protective action strategies	Refer to basis for 10 CFR Part 50, Appendix E, Section IV.3.
5. During the years between decennial censuses, nuclear power reactor licensees shall estimate EPZ permanent resident population changes once a year, but no later than 365 days from the date of the previous estimate, using the most recent U.S. Census Bureau annual resident population estimate and State/local government population data, if available. These licensees shall maintain these estimates so that they are available for NRC inspection during the period between decennial censuses and shall submit these estimates to the NRC with any updated ETE analysis.	Refer to basis for 10 CFR Part 50, Appendix E, Section IV.3.
6. If at any time during the decennial period, the EPZ permanent resident population increases such that it causes the longest ETE value for the 2-mile zone or 5-mile zone, including all affected Emergency Response	Refer to basis for 10 CFR Part 50, Appendix E, Section IV.3.



**Table 1**  
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10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p><del>Planning Areas, or for the entire 10-mile EPZ to increase by 25 percent or 30 minutes, whichever is less, from the nuclear power reactor licensee's currently NRC approved or updated ETE, the licensee shall update the ETE analysis to reflect the impact of that population increase. The licensee shall submit the updated ETE analysis to the NRC under § 50.4 no later than 365 days after the licensee's determination that the criteria for updating the ETE have been met and at least 180 days before using it to form protective action recommendations and providing it to State and local governmental authorities for use in developing offsite protective action strategies.</del></p>	
<p>A. 1. A description of the normal plant operating organization.</p>	<p>Based on the permanently shut down and defueled status of the reactor, a decommissioning reactor is not authorized to operate under 10 CFR 50.82(a). Because the licensee cannot operate the reactors, the licensee does not need to have a "plant operating organization."</p>
<p><del>A. 3. A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.</del></p>	<p>The number of staff at decommissioning sites is generally small but is commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. Decommissioning sites typically have a level of emergency response that does not require response by headquarters personnel.</p>
<p>A. 4. Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.</p>	<p>Although, the likelihood of events that would result in doses in excess of the EPA PAGs to the public beyond the owner controlled area boundary based on the permanently shut down and defueled status of the reactor is extremely low, the licensee still must be able to determine if a radiological release is occurring. If a release is occurring, then the licensee staff must promptly communicate that information to offsite authorities for their consideration. The offsite organizations are responsible for deciding what, if any, protective actions should be taken based on comprehensive emergency planning.</p>
<p><del>A. 5. Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The special qualifications of these persons shall be described.</del></p>	<p>The number of staff at decommissioning sites is generally small but should be commensurate with the need to operate the facility in a manner that is protective of public health and safety.</p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p>A.7. <del>By June 23, 2014, identification of, and a description of the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including hostile action at the site. For purposes of this appendix, “hostile action” is defined as an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.</del></p>	<p>Although the NRC has previously exempted decommissioning power reactors from “hostile action” enhancements, the licensee’s physical security plan must continue to provide high assurance against a potential security event impacting a designated target set. Therefore, some EP requirements for security-based events are maintained.</p> <p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.1 and 50.47(b).</p>
<p>A.8. <del>Identification of the State and/or local officials responsible for planning for, ordering and controlling appropriate protective actions, including evacuations when necessary.</del></p>	<p>Offsite emergency measures are limited to support provided by local police, fire departments, and ambulance and hospital services, as appropriate. Due to the low probability of design-basis accidents or other credible events to exceed the EPA PAGs, protective actions such as evacuation should not be required, but could be implemented at the discretion of offsite authorities using a CEMP.</p> <p>Also refer to basis for 50.47(b)(10)</p>
<p>A.9. <del>By December 24, 2012, for nuclear power reactor licensees, a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.</del></p>	<p>Responsibilities should be well defined in the emergency plan and procedures, regularly tested through drills and exercises, and audited and inspected by the licensee and the NRC. The duties of the onshift personnel at a decommissioning reactor facility are not as complicated and diverse as those for an operating power reactor.</p> <p>The NRC considered the similarity between the staffing levels at a permanently shut down and defueled reactor and staffing levels at an operating non-power reactor site. The minimal systems and equipment needed to maintain the spent nuclear fuel in the SFP or in a dry cask storage system in a safe condition requires minimal personnel and is governed by Technical Specifications. In the EP Final Rule published in the <i>Federal Register</i> on November 23, 2011 (76 FR 72560), the NRC concluded that the staffing analysis requirement was not necessary for non-power reactor licensees due to the small staffing levels required to operate the facility.</p> <p>The staff also examined the actions required to mitigate the very low probability design basis events for the SFP. <i>[the licensee’s description of SFP makeup strategies]</i></p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
	<i>should be summarized here]</i>
<p>B.1. The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within <del>and outside</del> the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite <del>and offsite</del> monitoring. <del>By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.</del> The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.</p>	<p>The NRC found NEI 99-01 to be an acceptable method for the development of EALs. Decommissioning power reactors present a very low likelihood of any credible accident resulting in a radiological release. Together with the time available to initiate mitigative actions consistent with plant conditions or, if necessary, for offsite authorities to employ their CEMP to take protective actions between the initiating event and before the onset of a postulated fire, classification above the Alert level is no longer required, which is consistent with ISFSI facilities.</p> <p>Also refer to basis for 10 CFR Part 50, Appendix E, Section IV.1 and 50.47(b)(10).</p>
<p>C.1. The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described. The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described. Emergency action levels (based not only on onsite <del>and offsite</del> radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, <del>such as the pressure in containment and the response of the Emergency Core Cooling System</del>) for notification of offsite agencies shall be described. The existence, but not the details, of a message authentication scheme shall be noted for such agencies. The emergency classes defined shall include: (1) notification of unusual events, (2) alert, <del>(3) site area emergency,</del> and <del>(4) general emergency.</del> These classes are further discussed in</p>	<p>Containment parameters do not provide an indication of the conditions at a defueled facility and emergency core cooling systems are no longer required. Other indications such as SFP level or temperature can be used at sites where there is spent fuel in the SFPs.</p> <p>In the Statement of Considerations for the Final Rule for EP requirements for ISFSIs and for MRS facilities (60 FR 32430; June 22, 1995), the Commission responded to comments concerning a general emergency at an ISFSI and MRS, and concluded that, "...an essential element of a General Emergency is that a release can be reasonably expected to exceed EPA Protective Action Guidelines exposure levels off site for more than the immediate site area."</p> <p>The probability of a condition reaching the level above an emergency classification of Alert is very low. In the event of an accident at a defueled facility that meets the criteria for an exemption from the NRC's offsite EP requirements, there will be time available to initiate mitigative actions consistent with plant conditions, and if</p>

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
NUREG-0654/FEMA-REP-1.	<p>necessary, for offsite authorities to employ their CEMP to take protective actions</p> <p>As stated in NUREG-1738, for instances of small SFP leaks or loss of cooling scenarios, these events evolve very slowly and generally leave many days for recovery efforts. Offsite radiation monitoring will be performed as the need arises. Due to the decreased risks associated with defueled plants, offsite radiation monitoring systems are not required.</p> <p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.B.1.</p>
<p><del>C.2. By June 20, 2012, nuclear power reactor licensees shall establish and maintain the capability to assess, classify, and declare an emergency condition within 15 minutes after the availability of indications to plant operators that an emergency action level has been exceeded and shall promptly declare the emergency condition as soon as possible following identification of the appropriate emergency classification level. Licensees shall not construe these criteria as a grace period to attempt to restore plant conditions to avoid declaring an emergency action due to an emergency action level that has been exceeded. Licensees shall not construe these criteria as preventing implementation of response actions deemed by the licensee to be necessary to protect public health and safety provided that any delay in declaration does not deny the State and local authorities the opportunity to implement measures necessary to protect the public health and safety.</del></p>	<p>As explained in the justification for an exemption from 10 CFR 50.47(b), a decommissioning power reactor has a low likelihood of a credible accident resulting in radiological releases requiring offsite protective measures. For these reasons, the staff concludes that a decommissioning power reactor is not required to assess, classify and declare an emergency condition within 15 minutes.</p> <p><i>[The approved Permanently Defueled Emergency Plans for Kewaunee Power Station, and Crystal River Unit 3 contained commitments to assess, classify and declare an emergency as soon as possible and within 30 minutes]</i></p>
<p><del>D.1. Administrative and physical means for notifying local, State, and Federal officials and agencies and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary, shall be described. This description shall include identification of the appropriate officials, by title and agency, of the State and local government agencies within the EPZs.</del></p>	<p><i>[The State and local officials, and agencies to be notified are those in which the nuclear power plant is located.]</i></p> <p>Refer to basis for 10 CFR 50.47(b) and 50.47(b)(10).</p>
<p><del>D.2. Provisions shall be described for yearly dissemination to the public within the plume</del></p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.D.1.</p>

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p><del>exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.</del></p>	
<p><del>D.3. A licensee shall have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency. The licensee shall demonstrate that the appropriate governmental authorities have the capability to make a public alerting and notification decision promptly on being informed by the licensee of an emergency condition. Prior to initial operation greater than 5 percent of rated thermal power of the first reactor at the site, each nuclear power reactor licensee shall demonstrate that administrative and physical means have been established for alerting and providing prompt instructions to the public with the plume exposure pathway EPZ. The design objective of the prompt public alert and notification system shall be to have the capability to essentially complete the initial alerting and notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this alerting and notification capability will range from immediate alerting and notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the appropriate governmental authorities to make a judgment whether or not to activate the public alert and notification system. The alerting and notification capability shall additionally include administrative and physical means for a backup method of public alerting and notification capable of being used in the event the primary method of alerting and</del></p>	<p>A specific notification time should be provided and justified, as part of the exemption request (e.g. a licensee shall have the capability to notify responsible State and local governmental agencies as soon as possible, not to exceed 60 minutes).</p> <p><i>[The responsible State and local governmental agencies are the agencies whose jurisdictions include the area where the nuclear power plant is located.]</i></p> <p>Also refer to basis for 10 CFR 50.47(b) and 50.47(b)(10).</p>

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p><del>notification is unavailable during an emergency to alert or notify all or portions of the plume exposure pathway EPZ population. The backup method shall have the capability to alert and notify the public within the plume exposure pathway EPZ, but does not need to meet the 15 minute design objective for the primary prompt public alert and notification system. When there is a decision to activate the alert and notification system, the appropriate governmental authorities will determine whether to activate the entire alert and notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public alert and notification system shall remain with the appropriate governmental authorities.</del></p>	
<p><del>D.4. If FEMA has approved a nuclear power reactor site's alert and notification design report, including the backup alert and notification capability, as of December 23, 2011, then the backup alert and notification capability requirements in Section IV.D.3 must be implemented by December 24, 2012. If the alert and notification design report does not include a backup alert and notification capability or needs revision to ensure adequate backup alert and notification capability, then a revision of the alert and notification design report must be submitted to FEMA for review by June 24, 2013, and the FEMA approved backup alert and notification means must be implemented within 365 days after FEMA approval. However, the total time period to implement a FEMA approved backup alert and notification means must not exceed June 22, 2015.</del></p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV D.3. regarding the alert and notification system requirements.</p>
<p><del>E.8.a.(i) A licensee onsite technical support center and an emergency operations facility from which effective direction can be given and effective control can be exercised during an emergency;</del></p>	<p>Due to the low probability of design-basis accidents or other credible events to exceed the EPA PAGs, the significantly reduced staff and the minimal expected offsite response required, offsite agency response will not be required at an emergency operations facility (EOF) and onsite actions may be directed from the control room or other location, without the requirements imposed on a Technical Support Center (TSC) or EOF.</p> <p>Refer to basis for 10 CFR 50.47(b)(3).</p>
<p><del>(ii) For nuclear power reactor licensees, a licensee onsite operational support center;</del></p>	<p>NUREG-0696, "Functional Criteria for Emergency Response Facilities," provides that the operational</p>

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
	<p>support center (OSC) is an onsite area separate from the control room and the TSC where licensee operations support personnel will assemble in an emergency. For a defueled power plant, an OSC is no longer required to meet its original purpose of an assembly area for plant logistical support during an emergency. The OSC function can be incorporated into another facility.</p> <p>Refer to basis for 10 CFR 50.47(b)(3).</p>
<p><del>E.8.b. For a nuclear power reactor licensee's emergency operations facility required by paragraph 8.a of this section, either a facility located between 10 miles and 25 miles of the nuclear power reactor site(s), or a primary facility located less than 10 miles from the nuclear power reactor site(s) and a backup facility located between 10 miles and 25 miles of the nuclear power reactor site(s). An emergency operations facility may serve more than one nuclear power reactor site. A licensee desiring to locate an emergency operations facility more than 25 miles from a nuclear power reactor site shall request prior Commission approval by submitting an application for an amendment to its license. For an emergency operations facility located more than 25 miles from a nuclear power reactor site, provisions must be made for locating NRC and offsite responders closer to the nuclear power reactor site so that NRC and offsite responders can interact face-to-face with emergency response personnel entering and leaving the nuclear power reactor site. Provisions for locating NRC and offsite responders closer to a nuclear power reactor site that is more than 25 miles from the emergency operations facility must include the following:</del></p> <p><del>(1) Space for members of an NRC site team and Federal, State, and local responders;</del></p> <p><del>(2) Additional space for conducting briefings with emergency response personnel;</del></p> <p><del>(3) Communication with other licensee and offsite emergency response facilities;</del></p> <p><del>(4) Access to plant data and radiological</del></p>	<p>Refer to basis for 10 CFR 50.47(b)(3).</p>

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p>information; and</p> <p>(5) Access to copying equipment and office supplies;</p>	
<p><del>E.8.c. By June 20, 2012, for a nuclear power reactor licensee's emergency operations facility required by paragraph 8.a of this section, a facility having the following capabilities:</del></p> <p><del>(1) The capability for obtaining and displaying plant data and radiological information for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves;</del></p> <p><del>(2) The capability to analyze plant technical information and provide technical briefings on event conditions and prognosis to licensee and offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves; and</del></p> <p><del>(3) The capability to support response to events occurring simultaneously at more than one nuclear power reactor site if the emergency operations facility serves more than one site; and</del></p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.E.8.a(i) and 10 CFR 50.47(b)(3).</p>
<p><del>E.8.d. For nuclear power reactor licensees, an alternative facility (or facilities) that would be accessible even if the site is under threat of or experiencing hostile action, to function as a staging area for augmentation of emergency response staff and collectively having the following characteristics: the capability for communication with the emergency operations facility, control room, and plant security; the capability to perform offsite notifications; and the capability for engineering assessment activities, including damage control team planning and preparation, for use when onsite emergency facilities cannot be safely accessed during hostile action. The requirements in this paragraph 8.d must be implemented no later than December 23, 2014, with the exception of the capability for staging emergency response organization personnel at the alternative facility (or</del></p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.1. regarding hostile action.</p>



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<b>10 CFR Part 50, Appendix E, Section IV</b>	<b>Basis for Change</b>
<del>facilities) and the capability for communications with the emergency operations facility, control room, and plant security, which must be implemented no later than June 20, 2012.</del>	
<del>E.8.e. A licensee shall not be subject to the requirements of paragraph 8.b of this section for an existing emergency operations facility approved as of December 23, 2011;</del>	Refer to basis for 10 CFR 50.47(b)(3).
<del>E.9.a. Provisions for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communication shall be tested monthly.</del>	Refer to basis for 10 CFR 50.47(b) and (b)(10).  <i>[The State and the local governments in which the nuclear facility is located need to be informed of events and emergencies, so lines of communication must be maintained.]</i>
<del>E.9.c. Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.</del>	Because of the low probability of design-basis accidents or other credible events that would be expected to exceed the EPA PAGs and the available time to initiate mitigative actions consistent with plant conditions, and if necessary, for offsite authorities to employ their CEMP to take protective actions, licensees that meet the criteria for exemptions from offsite EP requirements do not need the TSC, EOF, or offsite field assessment teams.  Also refer to justification for 10 CFR 50.47(b)(3). Communication with State and local Emergency Operations Centers (EOCs) is maintained to coordinate assistance on site if required.
<del>E.9.d. Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility. Such communications shall be tested monthly.</del>	The functions of the control room, EOF, TSC and OSC may be combined into one or more locations due to the smaller facility staff and the greatly reduced required interaction with State and local emergency response facilities.  Also refer to basis for 10 CFR 50.47(b).
<del>F.1. The program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel:</del>	Due to the low probability of design-basis accidents or other credible events to exceed the EPA PAGs at a decommissioning site, and the mitigation strategies available for the licensees' onsite staffs, decommissioning sites typically have a level of emergency response that does not require response by headquarters personnel. Therefore, the NRC considers exempting licensee's headquarters personnel from training requirements reasonable.

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**EXEMPTIONS FOR CONSIDERATION**

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p>i. Directors and/or coordinators of the plant emergency organization;</p> <p>ii. Personnel responsible for accident assessment, including control room shift personnel;</p> <p>iii. Radiological monitoring teams;</p> <p>iv. Fire control teams (fire brigades);</p> <p>v. Repair and damage control teams;</p> <p>vi. First aid and rescue teams;</p> <p>vii. Medical support personnel;</p> <p>viii. <del>Licensee's headquarters support personnel;</del></p> <p>ix. Security personnel.</p> <p>In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/<del>Civil Defense</del>, local law enforcement personnel, <del>local news media persons</del>.</p>	<p>Due to the low probability of design-basis accidents or other credible events to exceed the EPA PAGs, offsite emergency measures are limited to support provided by local police, fire departments and medical services, as appropriate. Local news media personnel no longer need radiological orientation training since they will not be called upon to support the formal Joint Information Center. The term "Civil Defense" is no longer commonly used; references to this term in the examples provided in the regulation are therefore not needed.</p>
<p>F.2. The plan shall describe provisions for the conduct of emergency preparedness exercises as follows: Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, <del>test the public alert and notification system</del>, and ensure that emergency organization personnel are familiar with their duties.</p>	<p>Because of the low probability of design-basis accidents or other credible events that would be expected to exceed the limits of EPA PAGs and the available time to initiate mitigative actions consistent with plant conditions, and if necessary, for offsite authorities to employ their CEMP to take protective actions, the public alert and notification system will not be used and, therefore, requires no testing.</p> <p>Also refer to basis for 10 CFR 50.47(b)</p>
<p>F.2.a. <del>A full participation exercise which tests as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation shall be</del></p>	<p>Refer to basis for 10 CFR 50.47(b).</p> <p>The intent of submitting exercise scenarios for use by power reactor licensees is to check that licensees utilize</p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

**Strikethrough text indicates requested exemptions to rule language.**

10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p><del>conducted for each site at which a power reactor is located. Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in a full participation exercise required by this paragraph 2.a.</del></p> <p>F.2.a.(i), (ii), and (iii) are not applicable.</p>	<p>different scenarios in order to prevent the preconditioning of responders at power reactors. For defueled sites, there are limited events that could occur and the previously routine progression to General Emergency in power reactor site scenarios is not applicable to a decommissioning site.</p> <p>The licensee would be exempt from 10 CFR Part 50, Appendix E, Section F.2.a.(i)-(iii) because the licensee would be exempt from the umbrella provision of 10 CFR Part 50, Appendix E, Section F.2.a.</p>
<p>F.2.b. Each licensee at each site shall conduct a subsequent exercise of its onsite emergency plan every 2 years. <del>Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in an exercise required by this paragraph 2.b. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this section.</del> In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, event classification, notification of offsite authorities, and assessment of the onsite <del>and offsite</del> impact of radiological releases, <del>protective action recommendation development, protective action decision making, plant system repair and mitigative action implementation.</del> During these drills, activation of all of the licensee's emergency response facilities (Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF)) would not be necessary, licensees would have the opportunity to consider accident management strategies, supervised instruction would be permitted, operating staff in all participating facilities would have the opportunity to resolve problems (success paths) rather than have controllers intervene,</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section section IV.F.2.a.</p> <p>The low probability of design-basis accidents or other credible events that would exceed the EPA PAGs, the available time to initiate mitigative actions consistent with plant conditions, and if necessary, for offsite authorities to employ their CEMP to take protective actions, render a TSC, OSC and EOF unnecessary. The principal functions required by regulation can be performed at an onsite location that does not meet the requirements of the TSC, OSC or EOF.</p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
and the drills may focus on the onsite exercise training objectives.	
<p><del>F.2.c. Offsite plans for each site shall be exercised biennially with full participation by each offsite authority having a role under the radiological response plan. Where the offsite authority has a role under a radiological response plan for more than one site, it shall fully participate in one exercise every two years and shall, at least, partially participate in other offsite plan exercises in this period. If two different licensees each have licensed facilities located either on the same site or on adjacent, contiguous sites, and share most of the elements defining co-located licensees, then each licensee shall:</del></p> <p><del>(1) Conduct an exercise biennially of its onsite emergency plan;</del></p> <p><del>(2) Participate quadrennially in an offsite biennial full or partial participation exercise;</del></p> <p><del>(3) Conduct emergency preparedness activities and interactions in the years between its participation in the offsite full or partial participation exercise with offsite authorities, to test and maintain interface among the affected State and local authorities and the licensee. Co-located licensees shall also participate in emergency preparedness activities and interaction with offsite authorities for the period between exercises;</del></p> <p><del>(4) Conduct a hostile action exercise of its onsite emergency plan in each exercise cycle; and</del></p> <p><del>(5) Participate in an offsite biennial full or partial participation hostile action exercise in alternating exercise cycles.</del></p>	<p>See basis for 10 CFR Part 50, Appendix E, Section IV.1 and 10 CFR Part 50, Appendix E, Section IV.F.2.a.</p>
<p><del>F.2.d. Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in the ingestion pathway portion of exercises at least once every exercise cycle. In States with more than one nuclear power reactor plume exposure pathway EPZ, the State should rotate this participation from site to site. Each</del></p>	<p>Refer to basis for 10 CFR 50.47(b)(10).</p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

**Strikethrough text indicates requested exemptions to rule language.**

10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p><del>State with responsibility for nuclear power reactor emergency preparedness should fully participate in a hostile action exercise at least once every cycle and should fully participate in one hostile action exercise by December 31, 2015. States with more than one nuclear power reactor plume exposure pathway EPZ should rotate this participation from site to site.</del></p>	
<p>F.2.e. Licensees shall enable any State or local Government <del>located within the plume exposure pathway EPZ</del> to participate in the licensee's drills when requested by such State or local Government.</p>	<p>The responsible State and local governmental agencies are the agencies whose jurisdictions include the location of the nuclear power plant. Refer to basis for 10 CFR 50.47(b)(10).</p>
<p>F.2.f. Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, <del>in consultation with FEMA,</del> cannot (1) find reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency or (2) determine that the Emergency Response Organization (ERO) has maintained key skills specific to emergency response. <del>The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.</del></p>	<p>The Federal Emergency Management Agency (FEMA) is responsible for the evaluation of an offsite response exercise. No action is expected from State or local government organizations in response to an event at a decommissioning site other than firefighting, law enforcement and ambulance/medical services. Memoranda of understanding should be in place for those services. Offsite response organizations will continue to take actions on an all-hazards planning basis to protect the health and safety of the public as they would at any other industrial site.</p>
<p>F.2.i. Licensees shall use drill and exercise scenarios that provide reasonable assurance that anticipatory responses will not result from preconditioning of participants. <del>Such scenarios for nuclear power reactor licensees must include a wide spectrum of radiological releases and events, including hostile action.</del> Exercise and drill scenarios as appropriate must emphasize coordination among onsite and offsite response organizations.</p>	<p>Due to the low probability of design-basis accidents or other credible events to exceed the EPA PAGs, the available time to initiate mitigative actions consistent with plant conditions, and if necessary, for offsite authorities to employ their CEMP to take protective actions, the previously routine progression to General Emergency in power reactor site scenarios is not applicable to a decommissioning site. Therefore the licensee is not expected to demonstrate response to a wide spectrum of events.</p> <p>Also refer to basis for 10 CFR Part 50, Appendix E, Section IV.1 regarding hostile action.</p>
<p><del>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.</del></p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.F.2.</p>

**Table 1**  
**EXEMPTIONS FOR CONSIDERATION**

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10 CFR Part 50, Appendix E, Section IV	Basis for Change
<p><del>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 eight 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 developed under § 50.54(hh)(2), and integration of offsite resources with onsite justification. The licensee shall maintain a record of exercises conducted during each eight 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 eight 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 Part 52, the first eight year exercise cycle begins in the calendar year of the initial exercise required by Section IV.F.2.a.</del></p>	
<p><del>I. By June 20, 2012, for nuclear power reactor licensees, a range of protective actions to protect onsite personnel during hostile action must be developed to ensure the continued ability of the licensee to safely shut down the reactor and perform the functions of the licensee's emergency plan.</del></p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.I.</p>

**Note: Appendix E to 10 CFR Part 50, section VI.2 exempts permanently or indefinitely shutdown plants from the requirement to provide hardware to support the Emergency Response Data System (ERDS). Therefore, specific exemptions from Appendix E to 10 CFR Part 50, sections VI.1, 3, 4 and 10 CFR 50.72.(a)(4) are not required.**

## References

- 1) NEI 99-01, Revision 6 "Methodology for the Development of Emergency Action Levels for Non-Passive Reactors," November 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12326A805).
- 2) U.S. Nuclear Regulatory Commission, Commission Paper SECY-14-0066, "Request By Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements" June 27, 2014 (ADAMS Accession No. ML14072A257).
- 3) U.S. Nuclear Regulatory Commission, Commission Paper SECY-14-0118 "Request By Duke Energy Florida, Inc. for Exemptions from Certain Emergency Planning Requirements" October 29, 2014 (ADAMS Accession No. ML14219A444).
- 4) U.S. Nuclear Regulatory Commission, Staff requirements memoranda (SRM) to SECY-14-0066, "Request by Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements," dated August 7, 2014 (ADAMS Accession No. ML14219A366).
- 5) U.S. Nuclear Regulatory Commission, Staff requirements memoranda (SRM) to SECY-14-0118, "Request by Duke Energy Florida, Inc. for Exemptions from Certain Emergency Planning Requirements," dated December 30, 2014 (ADAMS Accession No. ML14364A111).
- 6) U.S. Nuclear Regulatory Commission, NUREG-1738, "Technical Study of Spent Fuel Accident Risk at Decommissioning Nuclear Power Plants," February 2001 (ADAMS Accession No. ML010430066).
- 7) U.S. Nuclear Regulatory Commission, NUREG/CR-6451, "A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear Power Plants," August 1997 (ADAMS Accession No. ML082260098).
- 8) U.S. Nuclear Regulatory Commission, NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," September 2014 (ADAMS Accession No. ML14255A365).
- 9) U.S. Nuclear Regulatory Commission, Commission Paper SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," June 28, 2000 (ADAMS Accession No. ML003721626).
- 10) U.S. Nuclear Regulatory Commission, Commission Paper SECY-01-0100, "Policy Issues Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools," June 4, 2001 (ADAMS Accession No. ML011450420).
- 11) U.S. Nuclear Regulatory Commission, Memorandum from Executive Director for Operations to the Commission, August 16, 2002 (ADAMS Accession No. ML030550706).

- 12) U.S. Nuclear Regulatory Commission, EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12054A735).
- 13) U.S. Nuclear Regulatory Commission, EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" (ADAMS Accession No. ML12056A044).
- 14) U.S. Nuclear Regulatory Commission, NUREG-1864, "A Pilot Probabilistic Risk Assessment of a Dry Cask Storage System at a Nuclear Power Plant," March 2007 (ADAMS Accession No. ML071340012).



## Attachment 1

### STAFF GUIDANCE FOR EVALUATION OF PERMANENTLY DEFUELED EMERGENCY PLANS

The table below provides an acceptable method for the staff's review of Permanently Defueled Emergency Plans for sites undergoing decommissioning. This table was developed from the applicable evaluation criteria in Section II to NUREG-0654/FEMA-REP-1 (Revision 1), based on the exemptions from 10 CFR 50.47(b) and Appendix E to Part 50 outlined in Table 1, "Exemptions for Consideration."

	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
<b>A</b>	50.47(b)(1) Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.	Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis. <b>[E.IV.1; IV.A.1, 2, 4, 7]</b>	<div>1.b. Each licensee and sub-organization having an operational role shall specify its concept of operations, and its relationship to the total effort.</div> <div>1.d. Each licensee shall identify a specific individual by title who shall be in charge of the emergency response.</div> <div>1.e. Each licensee shall provide for 24-hour per day emergency response, including 24-hour per day staffing of communications links.</div> <div>4. Each licensee shall be capable of continuous (24-hour) operations for a protracted period.</div>
<b>B</b>	50.47(b)(2) On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of	On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of	<div>1. Each licensee shall specify the onsite emergency organization of plant staff personnel for all shifts and its relation to the responsibilities and duties of the normal staff complement. (See Table B-1SD)</div> <div>2. Each licensee shall designate an individual who shall be on shift at all times and who shall have the authority and responsibility to immediately and unilaterally initiate any emergency actions.</div> <div>4. Each licensee shall establish the functional responsibilities assigned to the emergency coordinator.</div>

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	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
	response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.	response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified. [E.IV.A.1, 2, 4, 9; A.3; C.1]	5. Each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. (See Table B-1SD)
			9. Each licensee shall identify the services to be provided by local agencies for handling emergencies, e.g., police, ambulance, medical, hospital, and fire-fighting organizations. The licensee shall provide for transportation and treatment of injured personnel who may also be contaminated. Reference to the arrangements and agreements reached with contractor, private, and local support agencies shall be appended to the plan. The agreements shall delineate the authorities, responsibilities, and limits on the actions of the contractor, private organization, and local services support groups.

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**STAFF GUIDANCE FOR EVALUATION OF PERMANENTLY DEFUELED EMERGENCY PLANS**

Table B-1SD

Minimum Staffing Requirements for NRC Licensees for Decommissioning Nuclear Power Plant Emergencies (See B.1 and B.5)

MAJOR FUNCTIONAL AREA	MAJOR TASKS	EMERGENCY POSITION, TITLE, OR EXPERTISE	ON-SHIFT	AUGMENTED STAFF CAPABILITY FOR RESPONSE IN 2 HOURS
Plant Operations and assessment of Operational Aspects	Plant Operations	Shift Supervisor Shift Operator	1 1	
Emergency Direction and Control	Emergency Coordinator	Shift Supervisor	*	
Notification/Communication	Notify State and Federal personnel and maintain communications	Communicator	*	
Radiological Accident Assessment and Support of Operational Accident Assessment	Onsite Dose Assessment and Monitoring	Health Physics Expertise	*	1
Protective Actions (In-Plant)	In-Plant Surveys Radiation Protection a. Access Control b. HP Coverage for Repair, Corrective Actions, Search and Rescue, First Aid, and Firefighting c. Personnel Monitoring d. Dosimetry	Health Physics Technician	1	As needed
Engineering Support	Technical Direction	Technical Expertise		1
Plant Condition Evaluation, Repair and Corrective Action	Repair, Mitigation and Corrective Action	Shift Operators	**	As needed
Firefighting	Firefighting	Per Fire Protection Plan		
Rescue Operations/ First Aid	Rescue and First Aid		*	As needed
Security	Security	Per Security Plan		

\* May be provided by shift personnel assigned other functions. Identify if the shift personnel assigned EP functions/tasks are from Firefighting or Security resources.

\*\* Number of additional personnel required to perform site-specific mitigation strategies required for a catastrophic loss in spent fuel pool inventory.

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	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
<b>C</b>	(b)(3) Arrangements for requesting and effectively using assistance resources have been made and other organizations capable of augmenting the planned response have been identified.	Arrangements for requesting and effectively using assistance resources have been made and other organizations capable of augmenting the planned response have been identified. <b>[E.IV.A. 7]</b>	4. Each licensee shall identify nuclear and other facilities, organizations or individuals which can be relied upon in an emergency to provide assistance. Such assistance shall be identified and supported by appropriate letters of agreement.
<b>D</b>	(b)(4) A standard emergency classification and action level scheme, the basis of which include facility system and effluent parameters, is in use by the nuclear facility licensee.	A standard emergency classification and action level scheme, the basis of which include facility system and effluent parameters, is in use by the nuclear facility licensee. <b>[E.IV.1; IV.B.1, 2; C.1, 2]</b>	<div>1. An emergency classification and EAL scheme must be established by the licensee. The specific instruments, parameters or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures.</div> <div>2. The initiating conditions shall include all postulated accidents for the nuclear facility.</div>
<b>E</b>	(b)(5) Procedures have been established for notification, by the licensee, of State and local response organizations and for	Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency	<div>1. Each licensee shall establish procedures which describe mutually agreeable bases for notification of response organizations consistent with the emergency classification and action level scheme.</div> <div>2. Each licensee shall establish procedures for alerting, notifying and mobilizing emergency response personnel.</div>

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	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
	notification of emergency personnel by all organizations; the content of initial and follow up organizations has been established.	personnel by all organizations; the content of initial and follow up messages to response organizations has been established. <b>[E.IV.1; IV.A.6, 7; C.1, 2; D.1, 3; E]</b>	<p>4. The licensee, in coordination with State and local organizations, shall establish the contents of the emergency messages to be sent from the nuclear facility. These messages shall contain the following information if it is known and appropriate:</p> <ul style="list-style-type: none"> <li>a. location of incident and name and telephone number (or communications channel identification) of caller;</li> <li>b. date/time of incident;</li> <li>c. class of emergency;</li> <li>k. licensee emergency response actions underway;</li> <li>m. request for any needed onsite support by offsite organizations; and</li> <li>n. prognosis for worsening or termination of event based on facility information.</li> </ul>
<b>F</b>	(b)(6) Provisions exist for prompt communications among principal response organizations to emergency personnel.	Provisions exist for prompt communications among principal response organizations to emergency personnel. <b>[E.IV.1; IV.C.1; D.1, 3; E]</b>	<p>1. Each licensee shall establish reliable primary and backup means of communication from licensees to local and State response organizations. Such systems should be selected to be compatible with one another. Each plan shall include:</p> <ul style="list-style-type: none"> <li>a. provision for 24-hour per day notification to and activation of the State/local emergency response network; and at a minimum, a telephone link and alternate, including 24-hour per day manning of communications links that initiate emergency response actions;</li> <li>b. provision for communications with contiguous State/local governments;</li> <li>e. provision for alerting or activating emergency personnel in each response organization; and</li> <li>f. provision for communication by the licensee with NRC.</li> </ul>
			<p>2. Each licensee shall ensure that a coordinated communication link for medical support exists.</p>

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	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
			3. Each licensee shall conduct periodic testing of the entire emergency communications system (see evaluation criteria H.10 and N.2.a).
<b>G</b>	(b)(7) The principal points of contact with the news media for dissemination of information during an emergency) are established in advance, and procedures for coordinated dissemination of information to the public are established.	The principal points of contact with the news media for dissemination of information during an emergency are established in advance, and procedures for coordinated dissemination of information to the public are established. <b>[E.IV.A.7; D.2]</b>	3. a. Each licensee shall designate a point of contact for dissemination of information to the news media during an emergency.
			4. a. Each licensee shall designate a spokesperson who should have access to all necessary information. b. Each licensee shall establish arrangements for timely exchange of information among designated spokespersons. c. Each licensee shall establish coordinated arrangements for dealing with rumors.
<b>H</b>	(b)(8) Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	Adequate emergency facilities and equipment to support the emergency response are provided and maintained. <b>[E.IV.1; IV.E; G]</b>	2. Each licensee shall establish an emergency facility from which evaluation and coordination of all licensee activities related to an emergency is to be carried out, and from which the licensee shall provide information to Federal, State and local authorities responding to emergencies.
			4. Each licensee shall provide for timely activation and staffing of the facility described in the plan.
			5. Each licensee shall identify and establish onsite-monitoring systems that are to be used to initiate emergency measures as well as those to be used for conducting assessment. The equipment should include: a. geophysical phenomena monitors, (e.g., meteorological); b. radiological monitors, (e.g., process, area, effluent and portable monitors, and sampling equipment); d. fire and combustion products detectors.
			6. Each licensee shall make provision to acquire data from, or for, emergency access to offsite monitoring and analysis equipment including: a. geophysical phenomena monitors, (e.g., meteorological, seismic);

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	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
			<p>10. a. Each licensee should make provisions to inspect, inventory and operationally check emergency equipment/instruments at least once each calendar quarter and after each use. There shall be sufficient reserves of instruments/equipment to replace those which are removed from emergency kits for calibration or repair. Calibration of equipment shall be at intervals recommended by the supplier of the equipment.</p> <p>b. Communication systems shall be functionally tested as follows: State/local and NRC (ENS) communication systems shall be tested monthly. This is not the same as a communication drill as stated in N.2.</p> <p>11. Each plan shall include identification of emergency kits by general category (protective equipment, communications equipment, radiological monitoring equipment, and emergency supplies).</p>
<b>I</b>	(b)(9) Adequate methods, systems, and equipment for assessing and monitoring actual or potential consequences of a radiological emergency condition are in use.	Adequate methods, systems, and equipment for assessing and monitoring actual or potential consequences of a radiological emergency condition are in use. <b>[E.IV.1; IV.A.4; B.1; C.2; E]</b>	<p>1. Each licensee shall identify plant system and effluent parameter values characteristic of a spectrum of off-normal conditions and accidents, and shall identify the plant parameter values or other information which correspond to the example initiating conditions. Such parameter values and the corresponding emergency class shall be included in the appropriate facility emergency procedures. Facility emergency procedures shall specify the kinds of instruments being used and their capabilities.</p> <p>2. Onsite capability and resources to provide initial values and continuing assessment throughout the course of an accident shall include radiation monitors.</p>
<b>J</b>	(b)(10) A range of protective actions has been developed for emergency workers and the public.	A range of protective actions has been developed for the emergency workers and the public. <b>[IV.1; IV.B.10; IV.C.1; E; I]</b>	<p>1. Each licensee shall establish the means and time required to warn or advise onsite individuals and individuals who may be in areas controlled by the operator, including:</p> <ul style="list-style-type: none"> <li>a. employees not having emergency assignments;</li> <li>b. visitors;</li> <li>c. contractor and construction personnel; and</li> <li>d. other persons who may be in the public access areas on or passing through the site or within the owner controlled area.</li> </ul> <p>2. Each licensee shall make provisions for evacuation routes and transportation for onsite individuals.</p> <p>3. Each licensee shall provide for radiological monitoring of people evacuated from the site.</p>

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	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
			<p>5. Each licensee shall provide for a capability to account for all individuals onsite at the time of the emergency and ascertain the names of missing individuals within 60 minutes of the start of an emergency and account for all onsite individuals continuously thereafter.</p> <p>6. Each licensee shall, for individuals remaining or arriving onsite during the emergency, make provisions for:</p> <ul style="list-style-type: none"> <li>a. individual respiratory protection; and</li> <li>b. use of protective clothing.</li> </ul>
<b>K</b>	(b)(11) Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.	<p>Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.</p> <p><b>[IV.E]</b></p>	<p>1. Each licensee shall establish onsite exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Actions Guides for:</p> <ul style="list-style-type: none"> <li>a. removal of injured persons;</li> <li>b. undertaking corrective actions;</li> <li>c. performing assessment actions;</li> <li>d. providing first aid;</li> <li>e. performing personnel decontamination;</li> <li>f. providing ambulance service; and</li> <li>g. providing medical treatment services.</li> </ul> <p>2. Each licensee shall provide an onsite radiation protection program to be implemented during emergencies, including methods to implement exposure guidelines. The plan shall identify individual(s), by position or title, who can authorize emergency workers to receive doses in excess of 10 CFR Part 20 limits. Procedures shall be worked out in advance for permitting onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities. These procedures shall include expeditious decision making and a reasonable consideration of relative risks.</p> <p>3. a. Each licensee shall make provision for 24-hour-per-day capability to determine the doses received by emergency personnel involved in any nuclear accident, including volunteers. Each licensee shall make provisions for distribution of dosimeters. b. Each licensee shall ensure that dosimeters are read at appropriate frequencies and provide for maintaining dose records for emergency workers involved in any nuclear accident.</p>



**Attachment 1**

**STAFF GUIDANCE FOR EVALUATION OF PERMANENTLY DEFUELED EMERGENCY PLANS**

	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
			<p>5. a. Each licensee as appropriate, shall specify action levels for determining the need for decontamination. b. Each licensee, as appropriate, shall establish the means for radiological decontamination of emergency personnel wounds, supplies, instruments and equipment, and for waste disposal.</p> <p>6. Each licensee shall provide onsite contamination control measures (e.g., area access control; criteria for permitting return of areas and items to normal use).</p>
<b>L</b>	(b)(12) Arrangements are made for medical services for contaminated injured individuals.	<p>Arrangements are made for medical services for contaminated injured individuals.</p> <p><b>[E.IV.A.6, 7; E]</b></p>	<p>1. Each licensee shall arrange for hospital and medical services having the capability for evaluation of radiation exposure and uptake, including assurance that persons providing these services are adequately prepared to handle contaminated individuals.</p> <p>2. Each licensee shall provide for onsite first aid capability. (See O.3)</p> <p>4. Each licensee shall arrange for transporting victims of radiological accidents to medical support facilities.</p>
<b>M</b>	(b)(13) General plans for recovery and reentry are developed.	<p>General plans for recovery and reentry are developed.</p> <p><b>[IV.1; IV.H]</b></p>	<p>1. Each licensee shall develop general plans and procedures for reentry and recovery. This process should consider both existing and potential conditions.</p> <p>2. Each licensee plan shall contain the position/title, authority and responsibilities of individuals who will fill key positions in the facility recovery organization. This organization shall include technical personnel with responsibilities to develop, evaluate and direct recovery and reentry operations.</p>
<b>N</b>	(b)(14) Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of	<p>Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of</p>	<p>1. a. An exercise is an event that tests the integrated capability and a major portion of the basic elements existing within EP plans and organizations. Exercises shall be conducted as set forth in 10 CR 50, as exempted, and in accordance with applicable portion of Section IV.G (Challenging Drills and Exercises) to NSIR/DPR-ISG-01, “Emergency Planning for Nuclear Power Plants.” b. The licensee shall provide for a critique of the exercise. The scenario should be varied from year to year such that all major elements of the plans and preparedness organizations are tested.</p>

# Attachment 1

## STAFF GUIDANCE FOR EVALUATION OF PERMANENTLY DEFUELED EMERGENCY PLANS

	Regulations (as exempted per ISG)	NUREG-0654 (Revised – Decommissioned)	Evaluation Criteria
	exercises or drills are (will be) corrected.	exercises or drills are (will be) corrected.  [E.IV.1; E.9; F]	<p>2. A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular operation. A drill is often a component of an exercise. A drill shall be supervised and evaluated by a qualified drill instructor. Each licensee shall conduct drills, in addition to the exercise at the frequencies indicated below:</p> <p>a. Communication Drills: Communications with State and local governments shall be drilled annually. Communications with the NRC shall be drilled annually. Communication drills shall also include the aspect of understanding the content of messages.</p> <p>b. Fire Drills: Fire drills shall be conducted in accordance with the plant (nuclear facility) technical specifications.</p> <p>c. Medical Emergency Drills: A medical emergency drill involving a simulated contaminated individual which contains provisions for participation by the local support services agencies (i.e., ambulance and offsite medical treatment facility) shall be conducted annually.</p> <p>e. Health Physics Drills: (1) Health Physics drills shall be conducted annually.</p> <p>3. Each licensee shall describe how exercises and drills are to be carried out to allow free play for decision making and to meet the following objectives. The scenarios for use in exercises and drills shall include but not be limited to, the following:</p> <p>a. the basic objective(s) of each drill and exercise and appropriate evaluation criteria;</p> <p>b. the date(s), time period, place(s) and participating organizations;</p> <p>c. the simulated events;</p> <p>d. a time schedule of real and simulated initiating events;</p> <p>e. a narrative summary describing the conduct of the exercises or drills to include such things as simulated casualties, offsite fire department assistance, rescue of personnel, use of protective clothing, and</p> <p>f. a description of the arrangements for and advance materials to be provided to official observers.</p>

**Attachment 1**

**STAFF GUIDANCE FOR EVALUATION OF PERMANENTLY DEFUELED EMERGENCY PLANS**

	<b>Regulations (as exempted per ISG)</b>	<b>NUREG-0654 (Revised – Decommissioned)</b>	<b>Evaluation Criteria</b>
			<p>4. Official observers from the NRC should observe, evaluate, and critique the required exercises. A critique shall be scheduled at the conclusion of the exercise to evaluate the ability of licensee to respond as called for in the plan. The critique shall be conducted as soon as practicable after the exercise, and a formal evaluation should result from the critique.</p> <p>5. Each licensee shall establish means for evaluating observer and participant comments on areas needing improvement, including emergency plan procedural changes, and for assigning responsibility for implementing corrective actions. Each licensee shall establish management control used to ensure that corrective actions are implemented.</p>
<b>O</b>	(b)(15) Radiological emergency response training is provided to those who may be called on to assist in an emergency.	<p>Radiological emergency response training is provided to those who may be called on to assist in an emergency.</p> <p><b>[E.IV.1; IV.F]</b></p>	<p>1. Each licensee shall assure the training of appropriate individuals. a. Each facility shall provide site specific emergency response training for those offsite emergency organizations who may be called upon to provide assistance in the event of an emergency.</p> <p>3. Training for individuals assigned to licensee first aid teams shall include courses equivalent to Red Cross First Aid, CPR, AED for Lay Responders or equivalent. (See L.2)</p> <p>5. Each licensee shall provide for the initial and annual retraining of personnel with emergency response responsibilities.</p>
<b>P</b>	(b)(16) Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.	<p>Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.</p> <p><b>[IV.1; IV.G]</b></p>	<p>1. Each licensee shall provide for the training of individuals responsible for the planning effort.</p> <p>2. Each licensee shall identify by title the individual with the overall authority and responsibility for radiological emergency response planning.</p> <p>3. Each licensee shall designate an Emergency Planning Coordinator with responsibility for the development and updating of emergency plans and coordination of these plans with other response organizations.</p> <p>4. Each licensee shall update its plan and agreements as needed, review and certify it to be current on an annual basis. The update shall take into account changes identified by drills and exercises.</p>

# Attachment 1

## STAFF GUIDANCE FOR EVALUATION OF PERMANENTLY DEFUELED EMERGENCY PLANS

	Regulations (as <i>exempted per ISG</i> )	NUREG-0654 (Revised – Decommissioned)	Evaluation Criteria
			5. The emergency response plans and approved changes to the plans shall be forwarded to all organizations and appropriate individuals with responsibility for implementation of the plans. Revised pages shall be dated and marked to show where changes have been made.
			7. Each plan shall contain a listing, by title, procedures required to implement the plan. The listing shall include the section(s) of the plan to be implemented by each procedure.
			8. Each plan shall contain a specific table of contents. Plans submitted for NRC review should have a cross-reference to the criteria listed in this Attachment 1.
			10. Each licensee shall provide for updating telephone numbers in emergency procedures at least quarterly.

**Attachment 2**  
**PREVIOUSLY APPROVED LICENSING ACTIONS**

<b>Licensee</b>	<b>Date Operations Ceased</b>	<b>Date Exemption Issued</b>	<b>Basis for Exemption</b>
Humbolt Bay	7/2/76	4/29/87	<p>License amendment approved for the Decommissioning Emergency Plan – no exemption from EP requirements was ever issued. The NRC approval of the emergency plan granted a <i>de facto</i> exemption from offsite emergency preparedness requirements.</p> <p>The staff evaluated offsite radiological consequences of potential accidents involving the fuel stored in the SFP including a fuel handling accident, a non-mechanistic heavy load drop, and a seismically-or otherwise-induced rearrangement of the stored fuel assemblies. Other hypothetical accident scenarios considered by the staff were a non-mechanistic expulsion of all pool water to the atmosphere, a spent fuel rupture, and uncontrolled release of all contents of the liquid radwaste tanks to the discharge canal. The staff concluded that all atmospheric releases were well below EPA PAGs.</p>
La Crosse	4/30/87	7/8/88	<p>License amendment approved for the Decommissioning Emergency Plan – no exemption from EP requirements was ever issued. The NRC approval of the emergency plan granted a <i>de facto</i> exemption from offsite emergency preparedness requirements.</p> <p>The staff evaluated the offsite consequences of potential accidents to the fuel stored in the spent fuel pool. The analysis assumed all fuel rods damaged with no iodine filters operating, and no fuel pool water missing. In this scenario, the doses at the exclusion area boundary would be less than 25% of the 10 CFR Part 100 paragraph 11 guideline values, i.e., much less than 75 rem for the thyroid and 6 rem for whole-body dose. The above dose values are the acceptance criteria value from the NRC Standard Review Plan (NUREG-800) Section 15.7.5 on spent fuel cask drop accidents. Similarly, the calculated doses are well below EPA PAGs.</p>

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**PREVIOUSLY APPROVED LICENSING ACTIONS**

<b>Licensee</b>	<b>Date Operations Ceased</b>	<b>Date Exemption Issued</b>	<b>Basis for Exemption</b>
Fort St. Vrain	8/18/89	12/31/90	Analyzed radiological consequences of potential accidents involving a fuel handling accident (dropped fuel cask) provided doses offsite less than EPA PAGs.
Rancho Seco	6/7/89	2/22/91	Analyzed radiological consequences of potential accidents involving a fuel handling accident (dropped fuel cask) provide doses offsite less than EPA PAGs.
Yankee Rowe	10/1/91	10/30/92	Analyzed radiological consequences of potential accidents involving a fuel handling accident (dropped fuel cask) provide doses offsite less than EPA PAGs.
Trojan	11/2/92	9/30/93	<p>Analyzed radiological consequences of potential accidents involving a fuel handling accident (dropped fuel cask) provide doses offsite less than EPA PAGs.</p> <p>The staff concluded that in view of the low likelihood of a seismic event &gt; 0.5g and the time elapsed since shutdown of the facility, and the configuration of the fuel in the spent fuel pool, that there would be sufficient time after a postulated loss of water and before the initiation of a cladding fire for the licensee to implement actions to preclude heat up of the spent fuel.</p>

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**PREVIOUSLY APPROVED LICENSING ACTIONS**

<b>Licensee</b>	<b>Date Operations Ceased</b>	<b>Date Exemption Issued</b>	<b>Basis for Exemption</b>
Haddam Neck	7/22/96	8/28/98	<p>The staff evaluated:</p> <ol style="list-style-type: none"> <li>1. Release of activity from combustible IX resin and fuel handling accidents would not exceed EPA PAGs.</li> <li>2. For gamma radiation due to a loss of spent fuel pool level, it would take 2.6 days to exceed EPA PAGs.</li> <li>3. For a bounding scenario where the fuel is totally uncovered, the decay heat would not heat up the cladding higher than 565 degrees Celsius (C) , therefore the cladding would stay intact.</li> </ol> <p>The staff concluded that the postulated doses to the general public from any reasonably conceivable accident would not exceed EPA PAGs and, for the loss of fuel pool level, the length of time available gives confidence that mitigative actions could be taken and provides confidence that additional offsite measures could be taken without planning.</p>
Maine Yankee	12/6/96	9/3/98	<p>The staff evaluated:</p> <ol style="list-style-type: none"> <li>1. A fire involving resin and gamma radiation due to a loss of spent fuel pool level not exceeding EPA PAGs.</li> <li>2. A bounding scenario where the fuel is totally uncovered and no natural circulation flow path exists. The staff calculated that it would take ~10 hours to heat up to 900 degrees C.</li> </ol> <p>The staff concluded that the postulated doses to the general public from any reasonably conceivable accident would not exceed EPA PAGs and, for the bounding accident, the length of time available gives confidence that mitigative actions and, if necessary, offsite measures for the public could be taken without preplanning.</p>

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**PREVIOUSLY APPROVED LICENSING ACTIONS**

<b>Licensee</b>	<b>Date Operations Ceased</b>	<b>Date Exemption Issued</b>	<b>Basis for Exemption</b>
Big Rock Point	8/29/97	9/30/98	<p>The staff evaluated:</p> <ol style="list-style-type: none"> <li>1. Gap release of activity from a fuel handling accident and heavy load drops on spent fuel not exceeding EPA PAGs.</li> <li>2. A fire involving resin and gamma radiation due a loss of spent fuel pool level not exceeding EPA PAGs.</li> <li>3. A bounding scenario where the fuel is totally uncovered and no natural circulation flow path exists. The staff calculated that it would take ~14 hours to heat up to 900 degrees C.</li> </ol> <p>The staff concluded that the postulated doses to the general public from any reasonably conceivable accident would not exceed EPA PAGs and, for the bounding accident, the length of time available gives confidence that mitigative actions and, if necessary, offsite measures for the public could be taken without preplanning.</p>
Zion	2/21/97	8/31/99	<p>The staff concluded that there were no design basis accidents or other credible events that would result in a radiological dose beyond the exclusion area boundary that would exceed EPA PAGs.</p> <p>For a bounding scenario where the highest power fuel bundle is totally uncovered and assuming an adiabatic boundary conditions existed, the decay heat would not heat up higher than 482 degrees C; therefore the cladding would stay intact.</p>
Kewaunee	5/7/2013	10/27/2014	<p>No design basis accidents or other credible events that would result in a radiological dose beyond the exclusion area boundary that would exceed EPA PAGs. Adiabatic heatup of spent fuel would take at least 10 hours for cladding temperature to reach 900 degrees C. Multiple SFP makeup strategies could be completed by on-shift staff.</p>



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**PREVIOUSLY APPROVED LICENSING ACTIONS**

<b>Licensee</b>	<b>Date Operations Ceased</b>	<b>Date Exemption Issued</b>	<b>Basis for Exemption</b>
Crystal River-3	9/26/2009	3/ / 2015	No design basis accidents or other credible events that would result in a radiological dose beyond the exclusion area boundary that would exceed EPA PAGs. Adiabatic heatup of spent fuel would take at least 19.7 hours for cladding temperature to reach 900 degrees C. Multiple SFP makeup strategies could be completed by on-shift staff.