



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 11, 2017

Ms. Mary J. Fisher
Senior Director for Decommissioning
Omaha Public Power District
Fort Calhoun Station
9610 Power Lane, Mail Stop FC-2-4
Blair, NE 68008

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 – EXEMPTIONS FROM CERTAIN
EMERGENCY PLANNING REQUIREMENTS AND RELATED SAFETY
EVALUATION (CAC NO. MF9067; EPID L-2016-LLE-0003)

Dear Ms. Fisher:

The U.S. Nuclear Regulatory Commission (NRC) has approved the enclosed exemptions from specific requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.47, "Emergency plans," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50. This action is in response to your application for exemptions dated December 16, 2016, as supplemented by letters dated February 10, April 14, and April 20, 2017.

A copy of the NRC staff's safety evaluation is also enclosed. The exemptions will be forwarded to the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in black ink, reading "James Kim", is positioned above the typed name.

James Kim, Project Manager
Special Projects and Process Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosures:

1. Exemptions
2. Safety Evaluation

cc: Listserv

ENCLOSURE 1

EXEMPTIONS

NUCLEAR REGULATORY COMMISSION

Docket No. 50-285

Omaha Public Power District

Fort Calhoun Station, Unit No. 1

Exemption

I. Background

Omaha Public Power District (OPPD, the licensee) is the holder of Renewed Facility Operating License No. DPR-40 for Fort Calhoun Station, Unit No. 1 (FCS). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC) now or hereafter in effect. The facility consists of a pressurized-water reactor located in Washington County, Nebraska.

By letter dated August 25, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16242A127), OPPD submitted a certification to the NRC indicating it would permanently cease power operations at FCS on October 24, 2016. On October 24, 2016, OPPD permanently ceased power operation at FCS. On November 13, 2016 (ADAMS Accession No. ML16319A254), OPPD certified that it had permanently defueled the FCS reactor vessel.

In accordance with § 50.82(a)(1)(i) and (ii), and § 50.82(a)(2) of Title 10 of the *Code of Federal Regulations* (10 CFR), the specific license for the facility no longer authorizes reactor operation, or emplacement or retention of fuel in the respective reactor vessel, after certifications of permanent cessation of operations and of permanent removal of fuel from the reactor vessel are docketed. The facility is still authorized to possess and store irradiated (i.e., spent) nuclear fuel. The spent fuel is currently being stored onsite in a spent fuel pool (SFP).

During normal power reactor operations, the forced flow of water through the reactor coolant system removes heat generated by the reactor. The reactor coolant system, operating at high temperatures and pressures, transfers this heat through the steam generator tubes converting non-radioactive feedwater to steam, which then flows to the main turbine generator to produce electricity. Many of the accident scenarios postulated in the updated safety analysis reports (USARs) for operating power reactors involve failures or malfunctions of systems, which could affect the fuel in the reactor core and, in the most severe postulated accidents, would involve the release of large quantities of fission products. With the permanent cessation of reactor operations at FCS and the permanent removal of the fuel from the reactor vessel, such accidents are no longer possible. The reactor, reactor coolant system, and supporting systems are no longer in operation and have no function related to the storage of the spent fuel. Therefore, emergency planning (EP) provisions for postulated accidents involving failure or malfunction of the reactor, reactor coolant system, or supporting systems are no longer applicable.

The EP requirements of 10 CFR 50.47, "Emergency plans," and Appendix E to 10 CFR Part 50, "Emergency Planning and Preparedness for Production and Utilization Facilities," continue to apply to nuclear power reactors that have permanently ceased operation and have removed all fuel from the reactor vessel. There are no explicit regulatory provisions distinguishing EP requirements for a power reactor that is permanently shut down and defueled from those for a reactor that is authorized to operate. To reduce or eliminate EP requirements that are no longer necessary due to the decommissioning status of the facility, OPPD must obtain exemptions from those EP regulations. Only then can OPPD modify the FCS emergency plan to reflect the reduced risk associated with the permanently shutdown and defueled condition of FCS.

II. Request/Action

By letter dated December 16, 2016 (ADAMS Accession No. ML16356A578), OPPD requested exemptions from certain EP requirements of 10 CFR Part 50 for FCS. More specifically, OPPD requested exemptions from certain planning standards in 10 CFR 50.47(b) regarding onsite and offsite radiological emergency plans for nuclear power reactors; from certain requirements in 10 CFR 50.47(c)(2) that require establishment of plume exposure and ingestion pathway emergency planning zones for nuclear power reactors; and from certain requirements in 10 CFR 50, Appendix E, Section IV, which establish the elements that make up the content of emergency plans. In letters dated February 10, April 14, and April 20, 2017 (ADAMS Accession Nos. ML17041A443, ML17104A191, and ML17111A857, respectively), OPPD provided responses to the NRC staff's requests for additional information concerning the proposed exemptions.

The information provided by OPPD included justifications for each exemption requested. The exemptions requested by OPPD would eliminate the requirements to maintain formal offsite radiological emergency plans, reviewed by the Federal Emergency Management Agency (FEMA) under the requirements of 44 CFR Part 350, and reduce the scope of onsite EP activities. The licensee stated that the application of all of the standards and requirements in 10 CFR 50.47(b), 10 CFR 50.47(c), and 10 CFR Part 50, Appendix E is not needed for adequate emergency response capability, based on the substantially lower onsite and offsite radiological consequences of accidents still possible at the permanently shutdown and defueled facility, as compared to an operating facility. If offsite protective actions were needed for a very unlikely accident that could challenge the safe storage of spent fuel at FCS, provisions exist for offsite agencies to take protective actions using a comprehensive emergency management plan (CEMP) under the National Preparedness System to protect the health and safety of the public. A CEMP in this context, also referred to as an emergency operations plan (EOP), is addressed

in FEMA's Comprehensive Preparedness Guide 101, "Developing and Maintaining Emergency Operations Plans," which is publicly available at http://www.fema.gov/pdf/about/divisions/npd/CPG_101_V2.pdf. Comprehensive Preparedness Guide 101 is the foundation for State, territorial, Tribal, and local EP in the United States. It promotes a common understanding of the fundamentals of risk-informed planning and decision-making 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."

III. Discussion

In accordance with 10 CFR 50.12, "Specific exemptions," the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) any of the special circumstances listed in 10 CFR 50.12(a)(2) are present. These special circumstances include, among other things, that the application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

As noted previously, the current EP regulations contained in 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50 apply to both operating and shutdown power reactors. The NRC has consistently acknowledged that the risk of an offsite radiological release at a power reactor that has permanently ceased operations and removed fuel from the reactor vessel is

significantly lower, and the types of possible accidents are significantly fewer, than at an operating power reactor. However, current EP regulations do not recognize that once a power reactor permanently ceases operation, the risk of a large radiological release from credible emergency accident scenarios is significantly reduced. The reduced risk for any significant offsite radiological release is based on two factors. One factor is the elimination of accidents applicable only to an operating power reactor, resulting in fewer credible accident scenarios. The second factor is the reduced short-lived radionuclide inventory and decay heat production due to radioactive decay. Due to the permanently defueled status of the reactor, no new spent fuel will be added to the SFP and the radionuclides in the current spent fuel will continue to decay as the spent fuel ages. The irradiated fuel will produce less heat due to radioactive decay, increasing the available time to mitigate the SFP inventory loss. The NRC's NUREG/CR-6451, "A Safety and Regulatory Assessment of Generic BWR [Boiling Water Reactor] and PWR [Pressurized Water Reactor] Permanently Shutdown Nuclear Power Plants," dated August 31, 1997 (ADAMS Accession No. ML082260098) and the NRC's NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," February 2001 (ADAMS Accession No. ML010430066), confirmed that for permanently shutdown and defueled power reactors that are bounded by the assumptions and conditions in the report, the risk of offsite radiological release is significantly less than for an operating power reactor.

In the past, EP exemptions similar to those requested by FCS, have been granted to permanently shutdown and defueled power reactor licensees. However, the exemptions did not relieve the licensees of all EP requirements. Rather, the exemptions allowed the licensees to modify their emergency plans commensurate with the credible site-specific risks that were consistent with a permanently shutdown and defueled status. Specifically, the NRC's approval of these prior exemptions was based on the licensee's demonstration that: (1) the radiological consequences of design-basis accidents would not exceed the limits of the U.S. Environmental

Protection Agency's (EPA) Early Phase Protective Action Guides (PAGs) of one roentgen equivalent man (rem) at the exclusion area boundary; and (2) in the unlikely event of a beyond-design-basis accident resulting in a loss of all modes of heat transfer from the fuel stored in the SFP, there is sufficient time to initiate appropriate mitigating actions, and if needed, for offsite authorities to implement offsite protective actions using a CEMP approach to protect the health and safety of the public.

With respect to design-basis accidents at FCS, the licensee provided analysis demonstrating that 10 days following permanent shutdown, the radiological consequences of the only remaining design-basis accident with potential for offsite radiological release (the FHA in the Auxiliary Building, where the SFP is located) will not exceed the limits of the EPA PAGs at the exclusion area boundary. Therefore, because FCS has been permanently shutdown for approximately 13 months, there is no longer any design-basis accident that would warrant an offsite radiological emergency plan meeting the requirements of 10 CFR Part 50.

With respect to beyond design-basis accidents at FCS, the licensee analyzed a drain down of the spent fuel pool water that would effectively impede any decay heat removal. The analysis demonstrates that at 530 days (1 year, 165 days) after shutdown, there would be at least 10 hours after the assemblies have been uncovered until the limiting fuel assembly (for decay heat and adiabatic heatup analysis) reaches 900 degrees Celsius, the temperature used to assess the potential onset of fission product release. The analysis conservatively assumed the heat up time starts when the spent fuel pool has been completely drained, although it is likely that site personnel will start to respond to an incident when drain down starts. The analysis also does not consider the period of time from the initiating event causing loss of SFP water inventory until cooling is lost.

The NRC staff reviewed the licensee's justification for the requested exemptions against the criteria in 10 CFR 50.12(a) and determined, as described below, that the criteria in 10 CFR 50.12(a) are met, and that the exemptions should be granted. An assessment of the

OPPD EP exemptions is described in SECY-17-0080, "Request by the Omaha Public Power District for Exemptions from Certain Emergency Planning Requirements for the Fort Calhoun Station, Unit No. 1," dated August 10, 2017 (ADAMS Accession No. ML17116A430). The Commission approved the NRC staff's recommendation to grant the exemptions in the staff requirements memorandum to SECY-17-0080, dated October 25, 2017 (ADAMS Accession No. ML17298A976). Descriptions of the specific exemptions requested by OPPD and the NRC staff's basis for granting each exemption are provided in SECY-17-0080 and summarized in a table at the end of this document. The staff's detailed review and technical basis for the approval of the specific EP exemptions, requested by OPPD, are provided in the NRC staff's safety evaluation dated December 11, 2017 (ADAMS Accession No. ML17263B198).

A. Authorized by Law

The licensee has proposed exemptions from certain EP requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR 50, Appendix E, Section IV, that would allow OPPD to revise the FCS Emergency Plan to reflect the permanently shutdown and defueled condition of the station. As stated above, in accordance with 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50. The NRC staff has determined that granting of the licensee's proposed exemptions will not result in a violation of the Atomic Energy Act of 1954, as amended, or the NRC's regulations. Therefore, the exemptions are authorized by law.

B. No Undue Risk to Public Health and Safety

As stated previously, OPPD provided analyses that show the radiological consequences of design-basis accidents will not exceed the limits of the EPA early phase PAGs at the exclusion area boundary. Therefore, formal offsite radiological emergency plans required under 10 CFR Part 50 are no longer needed for protection of the public beyond the exclusion area

boundary, based on the radiological consequences of design-basis accidents still possible at FCS.

Although very unlikely, there is one postulated beyond-design-basis accident that might result in significant offsite radiological releases. However, NUREG-1738 confirms that the risk of beyond-design-basis accidents is greatly reduced at permanently shutdown and defueled reactors. The NRC staff's analyses in NUREG-1738 concludes that the event sequences important to risk at permanently shutdown and defueled power reactors 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. As described in NUREG-1738, relaxation of offsite EP requirements in 10 CFR Part 50, a few months after shutdown resulted in only a small change in risk. The report further concludes that the change in risk due to relaxation of offsite EP requirements is small because the overall risk is low, and because even under current EP requirements for operating power reactors, EP was judged to have marginal impact on evacuation effectiveness in the severe earthquakes that dominate SFP risk. All other sequences including cask drops (for which offsite radiological emergency plans are expected to be more effective) are too low in likelihood to have a significant impact on risk.

Therefore, granting exemptions to eliminate the requirements of 10 CFR Part 50 to maintain offsite radiological emergency plans and to reduce the scope of onsite EP activities will not present an undue risk to the public health and safety.

C. Consistent with the Common Defense and Security

The requested exemptions by OPPD only involve EP requirements under 10 CFR Part 50 and will allow OPPD to revise the FCS Emergency Plan to reflect the permanently shutdown and defueled condition of the facility. Physical security measures at FCS are not affected by the requested EP exemptions. The discontinuation of formal offsite radiological

emergency plans and the reduction in scope of the onsite emergency planning activities at FCS will not adversely affect OPPD's ability to physically secure the site or protect special nuclear material. Therefore, the proposed exemptions are consistent with common defense and security.

D. Special Circumstances

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR Part 50, Appendix E, Section IV, is to provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, to establish plume exposure and ingestion pathway emergency planning zones for nuclear power plants, and to ensure that licensees maintain effective offsite and onsite radiological emergency plans. The standards and requirements in these regulations were developed by considering the risks associated with operation of a power reactor at its licensed full-power level. These risks include the potential for a reactor accident with offsite radiological dose consequences.

As discussed previously in Section III, because FCS is permanently shut down and defueled, there is no longer a risk of a significant offsite radiological release from a design-basis accident exceeding EPA early phase PAG at the exclusion area boundary and the risk of a significant offsite radiological release from a beyond-design-basis accident is greatly reduced when compared to an operating power reactor. The NRC staff has confirmed the reduced risks at FCS by comparing the generic risk assumptions in the analyses in NUREG-1738 to site-specific conditions at FCS and determined that the risk values in NUREG-1738 bound the risks presented by FCS. As indicated by the results of the research conducted for NUREG-1738 and more recently, for NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake

Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor” (ADAMS Accession No. ML14255A365), while other consequences can be extensive, accidents from SFPs with significant decay time have little potential to cause offsite early fatalities, even if the formal offsite radiological EP requirements were relaxed. The licensee’s analysis of a beyond-design-basis accident involving a complete loss of SFP water inventory, based on an adiabatic heatup analysis of the limiting fuel assembly for decay heat, shows that within 530 days (1 year, 165 days) after shutdown, the time for the limiting fuel assembly to reach 900 °C is 10 hours after the assemblies have been uncovered assuming a loss of air cooling.

The only analyzed beyond-design-basis accident scenario that progresses to a condition where a significant offsite release might occur, involves the very unlikely event where the SFP drains in such a way that all modes of cooling or heat transfer are assumed to be unavailable, which is referred to as an adiabatic heatup of the spent fuel. The licensee’s analysis of this beyond-design-basis accident shows that within 530 days (1 year, 165 days) after shutdown, more than 10 hours would be available between the time the fuel is initially uncovered (at which time adiabatic heatup is conservatively assumed to begin), until the fuel cladding reaches a temperature of 1652 degrees Fahrenheit (900 °C), which is the temperature associated with rapid cladding oxidation and the potential for a significant radiological release. This analysis conservatively does not include the period of time from the initiating event causing a loss of SFP water inventory until all cooling means are lost.

The NRC staff has verified OPPD’s analyses and its calculations. The analyses provide reasonable assurance that in granting the requested exemptions to OPPD, there is no design-basis accident that will result in an offsite radiological release exceeding the EPA early phase PAGs at the exclusion area boundary. In the unlikely event of a beyond-design-basis accident affecting the SFP that results in a complete loss of heat removal via all modes of heat transfer, there will be well over 10 hours available before an offsite release might occur and, therefore, at

least 10 hours to initiate appropriate mitigating actions to restore a means of heat removal to the spent fuel. If a radiological release were projected to occur under this unlikely scenario, a minimum of 10 hours is considered sufficient time for offsite authorities to implement protective actions using a CEMP approach to protect the health and safety of the public.

Exemptions from the offsite EP requirements in 10 CFR Part 50 have previously been approved by the NRC when the site-specific analyses show that at least 10 hours is available following a loss of SFP coolant inventory accident with no air cooling (or other methods of removing decay heat) until cladding of the hottest fuel assembly reaches the zirconium rapid oxidation temperature. The NRC staff concluded in its previously granted exemptions, as it does with the OPPD requested EP exemptions, that if a minimum of 10 hours is available to initiate mitigative actions consistent with plant conditions, or if needed, for offsite authorities to implement protective actions using a CEMP approach, then formal offsite radiological emergency plans, required under 10 CFR Part 50, are not necessary at permanently shutdown and defueled facilities.

Additionally, FCS committed to maintaining SFP makeup strategies in its letter to the NRC dated December 16, 2016 (ADAMS Accession No. ML16356A578). The multiple strategies for providing makeup to the SFP include: using existing plant systems for inventory makeup; an internal strategy that relies on the fire protection system with redundant pumps (one diesel-driven and electric motor-driven); and onsite diesel fire truck that can take suction from the Missouri River. These strategies will continue to be required as license condition 3.G, "Mitigation Strategy License Condition." Considering the very low probability of beyond-design-basis accidents affecting the SFP, these diverse strategies provide multiple methods to obtain additional makeup or spray to the SFP before the onset of any postulated offsite radiological release.

For all the reasons stated above, the NRC staff finds that the licensee's requested exemptions to meet the underlying purpose of all of the standards in 10 CFR 50.47(b), and

requirements in 10 CFR 50.47(c)(2) and 10 CFR Part 50, Appendix E, acceptably satisfy the special circumstances in 10 CFR 50.12(a)(2)(ii) in view of the greatly reduced risk of offsite radiological consequences associated with the permanently shutdown and defueled state of the FCS facility.

The NRC staff has concluded that the exemptions being granted by this action will maintain an acceptable level of emergency preparedness at FCS and, if needed, that there is reasonable assurance that adequate offsite protective measures can and will be taken by State and local government agencies using a CEMP approach in the unlikely event of a radiological emergency at the FCS facility. Since the underlying purposes of the rules, as exempted, would continue to be achieved, even with the elimination of the requirements under 10 CFR Part 50 to maintain formal offsite radiological emergency plans and reduction in the scope of the onsite emergency planning activities at FCS, the special circumstances required by 10 CFR 50.12(a)(2)(ii) exist.

E. Environmental Considerations

In accordance with 10 CFR 51.31(a), the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment as discussed in the NRC staff's Finding of No Significant Impact and associated Environmental Assessment published November 27, 2017 (82 FR 56060).

IV. Conclusions

Accordingly, the Commission has determined, pursuant to 10 CFR 50.12(a), that OPPD's request for exemptions from certain EP requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR Part 50, Appendix E, Section IV, and as summarized in the table at the end of this document, are authorized by law, will not present an undue risk to the public health

and safety, and are consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants OPPD's exemptions from certain EP requirements of 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR Part 50, Appendix E, Section IV, as discussed and evaluated in detail in the staff's safety evaluation dated December 11, 2017. The exemptions are effective as of April 7, 2018.

Dated at Rockville, Maryland, this 11th day of December, 2017.

For the Nuclear Regulatory Commission.

A handwritten signature in black ink, reading "Kathryn M. Brock". The signature is written in a cursive, flowing style.

Kathryn M. Brock, Acting Director,
Division of Operating Reactor Licensing,
Office of Nuclear Reactor Regulation.

Table of Exemptions Granted to Omaha Public Power District (OPPD).

Table 1 Evaluation of Specific Exemptions to EP Requirements
<p>10 CFR 50.47(b): The onsite and, except as provided in paragraph (d) of this section, offsite emergency response plans for nuclear power reactors must meet the following standards:</p>
<p><u>Staff's Evaluation:</u></p> <p>The NRC requires a level of licensee emergency preparedness commensurate with the potential consequences to public health and safety, and common defense and security at the licensee's site. The licensee's exemption request included radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of remaining applicable design basis accidents would not exceed the limits of the EPA early phase PAGs at the EAB. The licensee also concluded and the staff confirmed, as of 530 days (1 year, 165 days) after the final reactor shutdown, in the unlikely event of a loss of SFP integrity, due to a beyond design basis event, resulting in all cooling is lost to the spent fuel and a heat up under adiabatic conditions resulted, at least 10 hours would be available before the hottest fuel assembly reached 900 °C to take mitigative actions.</p> <p>The NUREG-1738, and enhancements put into place as a result of the events of September 11, 2001, and Fukushima Dai-ichi Accident, support staff assumptions that: only a highly unlikely, beyond design basis event (e.g., extreme earthquake or large aircraft impact) could result in an SFP fire. In addition, there would be a significant amount of time between the initiating event and the possible onset of conditions that could result in an SFP zirconium cladding fire. This time provides a substantial opportunity for event mitigation. Licensees are required to maintain effective strategies, sufficient resources and adequately trained personnel to mitigate such an event. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for OROs to implement these measures using a CEMP, "all hazards," approach.</p> <p>Considering the very low probability of beyond design basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not necessary for a permanently shut down and defueled nuclear power reactor.</p> <p>Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR 50.47(b) above is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR 50.47(b)(1): Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones 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.</p>

Table 1
Evaluation of Specific Exemptions to EP Requirements

Staff's Evaluation:

In NUREG-0396, the NRC provided that emergency response plans should be useful for responding to any accident that would produce offsite radiological doses in excess of the EPA PAGs. Additionally, NUREG-0396 introduced the concept of generic plume exposure pathway zones as a basis for the planning of response actions, which would result in dose savings in the environs of nuclear facilities in the event of a serious power reactor accident. In addition, reactor core melt (Class 9) scenarios, which were also considered in NUREG-0396, are no longer applicable to a permanently shut down and defueled power reactor.

In the Statement of Consideration (SOC) for the Final Rule for EP requirements for ISFSIs and for monitored retrievable storage (MRS) facilities (60 FR 32430; June 22, 1995), the Commission responded to comments concerning an EPZ for an ISFSI and MRS, and concluded that, "...based on the potential inventory of radioactive material, potential driving forces for distributing that amount of radioactive material, and the probability of the initiation of these events, the Commission concludes that the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones."

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, designated plume exposure and ingestion pathway EPZs are no longer needed.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(1), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR 50.47(b)(3): Arrangements for requesting and effectively using assistance resources have been made, ~~arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made,~~ and other organizations capable of augmenting the planned response have been identified.

Staff's Evaluation:

With the termination of reactor power operations at FCS and the permanent removal of the fuel from the reactor vessel to the SFP, most of the accident scenarios postulated for operating reactors are no longer possible. The spent fuel is now stored in the SFP and the ISFSI, and will remain onsite until it can be moved offsite for long term storage or disposal. The reactor, reactor coolant system and secondary system are no longer in operation and have no function related to the storage of the spent fuel. Therefore, postulated accidents involving failure or malfunction of the reactor, reactor coolant system, or supporting systems are no longer applicable. During reactor decommissioning, the principal public safety concerns involve the radiological risks associated with the storage of spent fuel onsite.

Table 1
Evaluation of Specific Exemptions to EP Requirements

The emergency operations facility (EOF) is a support facility for the purpose of managing the overall licensee emergency response (including coordination with Federal, State, and local officials), coordination of radiological and environmental assessments, and determination of recommended public protective actions. The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, an EOF would not be needed to coordinate these types of assessments for determining public protective actions. Onsite operations staff will continue to maintain and provide for communication and coordination capabilities with offsite authorities and OROs for the purpose of notification and for the level of support required for remaining design basis accidents and the prompt implementation of mitigative actions in response to a SFP accident.

Based on the above analysis and the analysis of 10 CFR 50.47(b), the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(3), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

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, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

Staff's Evaluation:

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for minimum initial offsite response measures is not required.

Based on the above analysis and the analysis of 10 CFR 50.47(b), the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(4), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

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 and the public has been established; and means to provide early notification and clear instruction to

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>the populace within the plume exposure pathway Emergency Planning Zone have been established.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, a means to provide early notification and clear instruction to the populace within a designated plume exposure pathway EPZ is no longer required.</p> <p>Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(1), the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(5), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR 50.47(b)(6): Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to provide prompt communication to the public within a designated plume exposure pathway EPZ in regards to initial or pre-determined protective actions is no longer needed.</p> <p>Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(1), the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(6), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR 50.47(b)(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.</p>

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Staff's Evaluation:

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to provide periodic information to the public within a designated plume exposure pathway EPZ on how they will be notified, what their initial or predetermined protective actions should be in an emergency and the physical location or locations for dissemination of information is not needed.

Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(1), the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(7), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR 50.47(b)(9): Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

Staff's Evaluation:

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for assessing or monitoring offsite consequences beyond the EAB is not needed.

Based on the above analysis and the analysis provided of 10 CFR 10 CFR 50.47(b), the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(9), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR 50.47(b)(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.

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Staff's Evaluation:

The Commission provided its view on evacuation planning for an ISFSI (not at an operating reactor site) in its SOC for the Final Rule for EP requirements for an ISFSI and an MRS (60 FR 32430; June 22, 1995) stating: "The Commission does not agree that as a general matter emergency plans for an ISFSI must include evacuation planning."

The NRC staff has determined that no credible events within the design basis would result in doses to the public that would exceed the EPA early phase PAGs at the EAB. Therefore, EPZs beyond the EAB and the associated protective actions developed from evacuation time estimates (ETEs) are no longer required. Additionally, in the unlikely event of an SFP accident, the iodine isotopes, which contribute to an offsite dose from an operating reactor power accident, are not present, so KI distribution would no longer serve as an effective or necessary supplemental protective action. As such, the staff concludes that OPPD provides for an acceptable level of emergency planning at FCS in its permanently shutdown and defueled condition, and also provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at FCS.

Although formal offsite REP plans (in accordance with 44 CFR Part 350) have typically been exempted for decommissioning sites, OROs will continue to be relied upon for firefighting, law enforcement, ambulance and medical services in support of the licensee's (onsite) emergency plan. The licensee is responsible for providing protective measures for any emergency workers responding onsite. Additionally, the licensee is responsible for control of activities within the EAB, including public access. The licensee actions that are necessary to protect the health and safety of members of the public who are in the EAB may include, but are not limited to, evacuation, sheltering and decontamination in the unlikely event of a release of radioactive materials.

Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(1), the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(10), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR 50.47(c)(2): ~~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.~~

Staff's Evaluation:

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to

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the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for an EPZ is not required.

Section 50.47(c)(2) and footnote 1 to Appendix E to 10 CFR Part 50 both state, in part: "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 [megawatt] thermal." This is not applicable to FCS and, therefore, requires no exemption.

Based on the above analysis and the analysis of 10 CFR 50.47(b)(10), the NRC staff concludes that the exempted language from 10 CFR 50.47(c)(2), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provision of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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, ~~and onsite protective actions during hostile action~~. 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.

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Staff's Evaluation:

After the terrorist attacks of September 11, 2001, the NRC evaluated the EP planning basis to ensure it continued to protect the public health and safety in the current threat environment. In 2002, the NRC issued Orders requiring compensatory measures, which include nuclear security and EP. The NRC staff determined that the EP planning basis continues to protect public health and safety; however, the NRC staff recognized that enhancements were desirable to ensure effective plan implementation during security related events at nuclear power reactors (e.g., more timely NRC notification; additional onsite protective action considerations, and revision of emergency action levels to identify security related emergencies more succinctly).

The NRC issued NRC Bulletin (BL) 2005-02, "Emergency Preparedness and Response Actions for Security Based Events," dated July 18, 2005, to obtain information from licensees on progress in implementing security event related EP program enhancements. The 2011 EP Final Rule, "Enhancements to Emergency Preparedness Regulations" (76 FR 72560; November 23, 2011), made generically applicable the security based response elements of NRC BL 2005-02. The enhancements of NRC BL 2005-02 were not applicable to holders of operating licenses for power reactors that had permanently ceased operations and had certified that fuel had been removed from the reactor vessel. The licensee has certified that it has permanently ceased operations at FCS and that all fuel has been removed from the reactor vessel. Therefore, the enhancements for hostile actions, as required by the 2011 EP Final Rule, are not necessary for FCS in its permanently shutdown and defueled status.

Additionally, the NRC excluded non-power reactors from the definition of "hostile action" at the time of the 2011 EP Final Rule 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. Like a non-power reactor, a decommissioning nuclear reactor also has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating nuclear reactor. For all of the above reasons, the NRC staff concludes that a decommissioning nuclear power reactor is not a facility that falls within the definition of "hostile action."

Although this analysis provides a justification for exempting FCS from "hostile action" related requirements, some EP requirements for security based events are maintained. The classification of security based events, notification of offsite authorities, and coordination with offsite agencies are still required.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.1, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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~~

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>recent U.S. Census Bureau data as of the date the applicant submits its application to the NRC.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirements for an EPZ and ETEs are not required.</p> <p>Based on the above analysis and the analysis of 10 CFR 50.47(b)(10), the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.2, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.</p> <p>Based on the above analysis and the analyses provided in Sections 4.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.3, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p> <p>Based on the above analysis and the analysis of 10 CFR Part 50, Appendix E, Section IV.2, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.3, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>

<p align="center">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>10 CFR Part 50, Appendix E, Section IV.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.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.</p> <p>Based on the above analysis and the analysis of 10 CFR Part 50, Appendix E, Section IV.2, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.4, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.</p> <p>Based on the above analysis and the analysis of 10 CFR Part 50, Appendix E, Section IV.2, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.5, above, is not necessary to achieve the underlying purpose of this requirement as</p>

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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 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.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.</p> <p>Based on the above analysis and the analysis of 10 CFR Part 50, Appendix E, Section IV.2, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.6, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.A.1: A description of the normal plant-operating organization.</p>
<p><u>Staff's Evaluation:</u></p> <p>Upon docketing of the certifications of permanent ceasing of operations and permanent removal of fuel from the reactor vessel, the 10 CFR Part 50 license for FCS was amended and no longer authorizes operation of the FCS reactor, or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Because the licensee is no longer authorized to operate the reactor, the licensee does not have a plant "operating" organization. A description of the plant organization, as it relates to the requirements in Section IV.A.1 to Appendix E of 10 CFR Part 50 is still required.</p> <p>Based on the above analysis, the NRC staff concludes that the exempted language from Section IV.A.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>10 CFR Part 50, Appendix E, Section IV.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.</p>
<p><u>Staff's Evaluation</u></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. OPPD furnished information concerning its SFP inventory makeup strategies that could be used in the event of a catastrophic loss of SFP water inventory and stated that designated on shift personnel are trained to implement such strategies with equipment maintained onsite. OPPD has site personnel designated to respond within two hours of the Alert classification to assist the on shift staff. As such, designation of specific licensee headquarters personnel is not necessary for the augmentation of the on shift staffing and, therefore, is not described.</p> <p>Based on the above analysis and the analysis of 10 CFR 50.47(b), the NRC staff concludes that the exempted language from Section IV.A.3 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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><u>Staff's Evaluation:</u></p> <p>The licensee's analysis demonstrated that, as of 10 days after the final reactor shutdown, no design basis accidents result in doses in excess of the EPA early phase PAGs to the public beyond the EAB. While it is unlikely that a beyond design basis event would result in doses in excess of the EPA early phase PAGs to the public beyond the EAB, the licensee still must be able to determine if a radiological release is occurring, thereby achieving the underlying purpose of the rule. If a release is occurring, then the licensee's staff are still required to communicate that information to offsite authorities for their consideration. The offsite authorities are responsible for deciding what, if any, protective actions should be taken that they consider appropriate to protect public health and safety.</p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for offsite dose projections is not required.</p>

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>Based on above analysis and the analysis of 10 CFR 50.47(b), the NRC staff concludes that the exempted language from Section IV.A.4 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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.</p>
<p><u>Staff's Evaluation:</u></p> <p>The number of licensee staff at decommissioning sites is generally smaller than that for an operating power reactor, but is still commensurate with the need to operate the facility in a manner that is protective of public health and safety. The NRC staff considered the similarity between the staffing levels at a permanently shut down and defueled reactor, and staffing levels at an operating power reactor site, since the spectrum of accidents at a decommissioning facility is greatly reduced requiring less specialized qualifications. The limited number of systems and equipment needed to maintain the spent fuel in a safe condition in the SFP or in an ISFSI requires only minimal personnel, which is governed by the FCS Technical Specifications.</p> <p>The licensee furnished information concerning its SFP inventory makeup strategies that could be used in the event of a catastrophic loss of SFP water inventory and stated that designated on shift personnel are trained to implement such strategies with equipment maintained onsite. The licensee has site personnel designated to respond within 2 hours of the Alert classification to assist the on shift staff. As such, additional employees or other persons with special qualifications are not anticipated.</p> <p>Considering the very low-probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for personnel with special qualifications, as directed in 10 CFR Part 50, Appendix E, Section IV.A.5, is not required.</p> <p>Based on above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR Part 50, Appendix E, Section IV.A.3, the NRC staff concludes that the exempted language from Section IV.A.5 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.A.7: 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 include the use of violent force to destroy equipment, take hostages,</p>

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>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.</p>
<p><u>Staff's Evaluation:</u></p> <p>In the 2011 EP Final Rule, the Commission defined "hostile action" as, in part, "an act directed toward a nuclear power plant or its personnel." The 2011 EP Final Rule made generically applicable, the security based response elements of NRC BL 2005-02. The enhancements from NRC BL 2005-02 were applicable to all holders of operating licenses for nuclear power reactors, except those who have permanently ceased operation and have certified that fuel has been removed from the reactor vessel.</p> <p>With the certifications of 10 CFR 50.82(a)(1)(ii), the 10 CFR Part 50 license for FCS no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Therefore, the enhancements for hostile actions required by the 2011 EP Final Rule are not applicable for FCS in its permanently shutdown and defueled status.</p> <p>Although the "hostile action" enhancements in the 2011 EP Final Rule are not applicable to a decommissioning reactor, 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, such as the classification of security based events, notification of offsite authorities, and coordination for the response of OROs (i.e., law enforcement, firefighting, medical assistance) onsite.</p> <p>Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR Part 50, Appendix E, Section IV.1, the NRC staff concludes that the exempted language from Section IV.A.7 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.A.8: Identification of the State and/or local officials responsible for planning for, ordering and controlling appropriate protective actions, including evacuations when necessary.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, identification of the State and/or local officials responsible for detailed pre planning for, ordering and controlling appropriate offsite protective actions, including evacuations when necessary, is no longer required as part of the FCS emergency plan. If deemed warranted by governmental officials, offsite protective actions would be implemented under a CEMP, or all hazards, process.</p>

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(1), the NRC staff concludes that the exempted language from Section IV.A.8 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.A.9 By December 24, 2012, for nuclear power reactor licensees, a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.</p>
<p><u>Staff's Evaluation:</u></p> <p>The number of staff required at decommissioning sites is significantly reduced commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. The duties of the on shift personnel at a decommissioning reactor facility are not as complicated and diverse as those for an operating power reactor. The systems and equipment needed to maintain the spent fuel in a safe condition in an SFP or in an ISFSI requires minimal personnel and are governed under the FCS Technical Specifications. In the 2011 EP Final Rule, the NRC required nuclear power plant licensees to provide a detailed analysis to show that on shift personnel assigned emergency plan implementation functions were not assigned any responsibilities that would prevent them from performing their assigned emergency plan functions. As part of the 2011 EP Final Rule, 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. Therefore, based on similarities of non-power reactors and decommissioning reactors with regard to staffing, and as discussed in Section 4.2.1, a detailed staffing analysis is not needed for a decommissioning reactor.</p> <p>Based on the above analysis, the NRC staff concludes that the exempted language from Section IV.A.9 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of the rule as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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 and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant. The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.</p>

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Staff's Evaluation:

Since a radiological release from any remaining applicable design basis accident is not estimated to exceed EPA early phase PAGs beyond the EAB, event classification above the Alert level is no longer required, which is consistent with exemptions for previous decommissioning power reactors. The licensee will still be required to maintain EALs for the classification of security based events to the Alert level, which was requested by OPPD in a letter dated December 16, 2016. In the EP Final Rule, the Commission defined "hostile action" as, in part, "an act directed toward a nuclear power plant or its personnel." The 2011 EP Final Rule made generically applicable the security based response elements of NRC BL 2005-02, which provided numerous enhancements to licensee emergency plans including security based EALs. The NRC staff is maintaining the requirement for security based EALs similar to power reactors as they were required by NRC Order EA-02-026, "Fort Calhoun Station, Unit 1 - Issuance of Order for Interim Safeguards and Compensatory Security Measures," dated February 25, 2002. Exemption from hostile action enhancements for decommissioning reactors was also previously discussed in Section 4.2.1 of this safety evaluation.

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, a decommissioning reactor is not required to have EALs to determine protective measures offsite. With respect to EALs for hostile action, refer to basis for 10 CFR Part 50, Appendix E, Section IV.1.

Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR Part 50, Appendix E, Section IV.1, the NRC staff concludes that the exempted language from Section IV.B.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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 and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, ~~such as the pressure in containment and the response of the Emergency Core Cooling System~~) 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, ~~(3) site area emergency, and (4) general emergency.~~ These classes are further discussed in NUREG-0654/FEMA-REP-1.

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Staff's Evaluation:

Containment and emergency core cooling system parameters no longer provide an indication of a potential emergency for a permanently shut down and defueled power reactor, and emergency core cooling systems are no longer required. Other available indications, such as SFP level, SFP temperature, and area radiation monitors, will remain at FCS and will continue to provide indicate the conditions of spent fuel stored in the SFP.

In the SOC 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, "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. As previously discussed, NRC studies have concluded that the maximum offsite dose would be less than 1 rem which is within the EPA Protective Action Guides." It further provides a response to comments concerning an EPZ for an ISFSI and MRS: "[B]ased on the potential inventory of radioactive material, potential driving forces for distributing that amount of radioactive material, and the probability of the initiation of these events, the Commission concludes that the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones."

The licensee's analysis demonstrates that no remaining applicable design basis accident would reach the dose criteria for the declaration of a Site Area Emergency or a General Emergency. As discussed previously in Section 4.2.14, the probability of a beyond design basis accident condition that could reach emergency classifications of a Site Area Emergency or a General Emergency is very low. In the unlikely event of a beyond design basis event resulting in the loss of all cooling to spent fuel stored in the SFP, as of 530 days (1 year, 165 days) after the final reactor shutdown, it would take 10 hours from the time the fuel is uncovered until it reaches a temperature of 900 °C. During this time, the licensee is required to maintain the capability to initiate prompt mitigative actions consistent with plant conditions. Considering the very low probability of beyond design basis events occurring that would affect SFP structural integrity, as well as the time available to initiate SFP mitigative measures before the onset of a postulated zirconium cladding fire, the need for an event classification level above an Alert is no longer required.

Based on the above analysis and the analysis of 10 CFR 50.47(b), the NRC staff concludes that the exempted language from Section IV.C.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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

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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.

Staff's Evaluation:

In the 2011 EP Final Rule (76 FR 72560; November 23, 2011), nuclear power reactor licensees were required to assess, classify and declare an emergency condition within 15 minutes. Non-power reactors do not have the same potential impact on public health and safety as do power reactors, and as such, non-power reactor licensees do not require complex offsite emergency response activities and are not required to assess, classify and declare an emergency condition within 15 minutes. Similarly, a decommissioning power reactor has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating power reactor. Unlike operating reactor accident sequences potentially leading to large early releases, accident scenarios at decommissioning plants' SFPs evolve much more slowly than a power reactor and provide a longer time period to initiate SFP mitigative actions or, if warranted by governmental officials, appropriate offsite protective actions for the public. Because a decommissioning power reactor, like a non-power reactor, does not have the same potential radiological impact on public health and safety as a power reactor, the NRC staff concludes that a decommissioning power reactor should not be required to assess, classify and declare an emergency condition within 15 minutes. The licensee proposes in its exemption requests to assess, classify, and declare an emergency condition within 30 minutes. The States of Nebraska and Iowa have agreed that this emergency declaration time is appropriate.

Based on the above analysis, the NRC staff concludes that the exempted language from Section IV.C.2 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

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

Staff's Evaluation:

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for prompt notification of the public and an EPZ are not needed.

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>Based on the above analysis and the analyses of 10 CFR 50.47(b), 10 CFR 50.47(b)(1), and 10 CFR 50.47(b)(5), the NRC staff concludes that the exempted language from Section IV.D.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.D.2: Provisions shall be described for yearly dissemination to the public within the plume 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.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for dissemination of emergency planning information to the public and an EPZ are not needed.</p> <p>Based on the above analysis and the analyses of 10 CFR 50.47(b), 10 CFR 50.47(b)(1), and 10 CFR 50.47(b)(5), the NRC staff concludes that the exempted language from Section IV.D.2 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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</p>

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~~capable of being used in the event the primary method of alerting and 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.~~

Staff's Evaluation:

In the permanently shutdown and defueled condition of the reactor, the rapidly developing scenarios associated with events initiated during reactor power operation are no longer credible. The slow progression of SFP events allows greater time for the licensee to successfully mitigate the accidents and, if necessary, for offsite authorities to implement appropriate protective measures using a CEMP, "all hazards," approach protect the health and safety of the public.

The licensee proposes in its exemption requests to complete emergency notifications within 60 minutes after an emergency declaration or a change in emergency classification level. Although FCS is a general licensed ISFSI and the FCS Emergency Plan is based on 10 CFR Part 50, the NRC staff considered the requirements in 10 CFR 72.32(a) to ensure consistency between general and specific licensed ISFSIs. The 60 minute notification timeliness is consistent with the notification time requirements for emergency plans based on the requirements in 10 CFR 72.32. Information will be disseminated to the public and media in accordance with State and local plans.

In the SOC 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 notification time of 15 minutes, and concluded that, "[t]he Commission has established a reasonable time limit for notification which has proven to be adequate in the past. 'The licensee shall also commit to notify the NRC operations center immediately after notifications of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency.'"

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, decommissioning reactors are not required to notify State and governmental agencies within 15 minutes. Additionally, the requirement for prompt notification of the public and an EPZ is not needed.

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(1), the NRC staff concludes that the exempted language from Section IV.D.3 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for prompt notification of the public and an EPZ, including backup alert and notification capabilities, are not needed.</p> <p>Based on the above analysis and the analysis of 10 CFR Part 50, Appendix E, Section IV.D.3, the NRC staff concludes that the exempted language from Section IV.D.4 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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;</p>
<p><u>Staff's Evaluation:</u></p> <p>The guidance in NUREG-0696, "Functional Criteria for Emergency Response Facilities," February 1981, provides that the technical support center (TSC) is an onsite facility located close to the control room that shall provide plant management and technical support to the reactor operating personnel located in the control room during emergency conditions. As there are no remaining applicable design basis accidents or beyond design basis accidents that would exceed the EPA early phase PAGs at the EAB, and the available time to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated zirconium cladding fire, a TSC</p>

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and EOF are no longer required to meet its original purpose during an emergency, nor to support initial SFP mitigation actions if needed. Coordination with offsite authorities and response organizations can be coordinated from the control room or another onsite location.

In addition, onsite actions may be directed from the control room or other onsite location, without the requirements imposed on a TSC. Due to the reduced size of on shift and emergency response organization (ERO) staff for a permanently shut down and defueled power reactor, separate facilities to accommodate emergency response staff are no longer required. As such, greater efficiency and coordination is gained by locating staff in a central onsite facility.

Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(3), the NRC staff concludes that the exempted language from Section IV.E.8.a(i) to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.E.8.a.(ii): ~~For nuclear power reactor licensees, a licensee onsite operational support center;~~

Staff's Evaluation:

The operational 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. The OSC should provide a location where plant logistic support can be coordinated during an emergency and restrict control room access to those support personnel specifically requested by the shift supervisor. The licensee provides that the control room is where plant systems and equipment parameters are monitored. The control room is the onsite center for emergency command and control. Control room personnel assess plant conditions, evaluate the magnitude and potential consequences of abnormal conditions, initiate preventative, mitigating and corrective actions and perform notifications.

With the permanently shutdown and defueled status of the FCS reactor and the storage of the spent fuel in the SFP and the ISFSI, an OSC is no longer required to meet its original purpose during an emergency, nor to support initial SFP mitigation actions if needed. When activated, the ERO reports to the Emergency Director to assist the on shift staff in the assessment, mitigation and response to an emergency and to support the dispatch of emergency teams. An onsite facility will continue to be maintained, from which effective direction can be given and effective control may be exercised during an emergency.

Based on the above analysis and the analysis of 10 CFR Part 50, Appendix E, Section IV.E.8.a(i), the NRC staff concludes that the exempted language from Section IV.E.8.a(ii) to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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~~

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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:

- (1) Space for members of an NRC site team and Federal, State, and local responders;
- (2) Additional space for conducting briefings with emergency response personnel;
- (3) Communication with other licensee and offsite emergency response facilities;
- (4) Access to plant data and radiological information; and
- (5) Access to copying equipment and office supplies;

Staff's Evaluation:

Based on the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(3), the NRC staff concludes that the exempted language from Section IV.E.8.b to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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:~~

- ~~(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;~~
- ~~(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~~
- ~~(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~~

Staff's Evaluation:

Based on the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(3), the NRC staff concludes that the exempted language from Section IV.E.8.c to Appendix E of 10 CFR Part 50 is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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~~

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>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 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.</p>
<p><u>Staff's Evaluation:</u></p> <p>Based on the analyses of 10 CFR 50.47(b), 10 CFR 50.47(b)(1), and 10 CFR Part 50, Appendix E, Section IV.A.7, the NRC staff concludes that the exempted language from Section IV.E.8.d to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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;</p>
<p><u>Staff's Evaluation:</u></p> <p>Based on the analyses of 10 CFR 50.47(b)(3) and 10 CFR Part 50, Appendix E, Section IV.E.8.a(i), the NRC staff concludes that the exempted language from Section IV.E.8.e to Appendix E of 10 CFR Part 50, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.E.9.a: Provisions for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communication shall be tested monthly.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, provisions for communications with contiguous State/local governments within the plume exposure pathway EPZ is not needed. The licensee proposes in its exemption requests to complete emergency notifications within 60 minutes after an emergency declaration or a change in emergency classification level. Communications systems will be maintained and tested monthly. FCS will maintain communications with the States of Nebraska and Iowa, and the NRC. The States of Nebraska and Iowa will provide notifications of an emergency declaration to Washington County (Nebraska) and Harrison County (Iowa). FCS will use the commercial telephone network as the primary means to notify State agencies with wireless communications as a backup mean of communications. These systems are used on a frequent basis with exceeds the monthly testing requirements.</p>

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(1), the NRC staff concludes that the exempted language from Section IV.E.9 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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.</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, as discussed previously for 10 CFR Part 50, Appendix E, Sections IV.E.8.a.(i) and IV.8.a.(ii), there is no need for a TSC, EOF, or offsite field assessment teams to meet the underlying purpose of the rule. With the elimination of the requirements for a TSC, EOF, and the field assessment teams, the requirements to perform annual testing is no longer required. Communications with State and local governments will continue to be tested monthly under 10 CFR Part 50, Appendix E, Section IV.E.9.a.</p> <p>Based on the above analysis and the analyses of 10 CFR Part 50, Appendix E, Section IV.E.8.a(i) and 10 CFR Part 50, Appendix E, Section IV.E.8.a(ii), the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.9.c, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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.</p>
<p><u>Staff's Evaluation:</u></p> <p>As discussed previously for 10 CFR Part 50, Appendix E, Sections IV.E.8.a.(i) and IV.8.a.(ii), the need for a separate TSC and EOF no longer exists given the smaller facility staffing and the greatly reduced required interaction with State and local emergency response facilities. Therefore, the NRC staff concludes that the functions of the control room, EOF, TSC, and the OSC may be combined into one or more locations. As a result, communications between the EOF and TSC, and the NRC, and monthly testing of these capabilities are no longer needed. Communications with NRC Headquarters and the appropriate NRC Regional Office Operations Center will continue to be tested monthly.</p>

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Based on the above analysis and the analyses of 10 CFR Part 50, Appendix E, Section IV.E.8.a(i) and 10 CFR Part 50, Appendix E, Section IV.E.8.a(ii), the NRC staff concludes that the exempted language from Section IV.E.9.d to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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:

- i. Directors and/or coordinators of the plant emergency organization;
- ii. Personnel responsible for accident assessment, including control room shift personnel;
- iii. Radiological monitoring teams;
- iv. Fire control teams (fire brigades);
- v. Repair and damage control teams;
- vi. First aid and rescue teams;
- vii. Medical support personnel;
- viii. ~~Licensee's headquarters support personnel;~~
- ix. Security personnel.

In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/~~Civil Defense~~, local law enforcement personnel; ~~local news media persons~~.

Staff's Evaluation:

The number of staff required at decommissioning sites is generally small, but is commensurate with the need to safely store spent fuel at the facility in a manner that ensures public health and safety. Decommissioning sites typically have a level of emergency response that does not require additional response by licensee headquarters personnel, therefore training of these personnel is not needed. Training for licensee personnel responding from company locations offsite will still be required to be trained based on ERO positions specified above.

"Civil Defense" is an outdated term and no longer used. The category of offsite responders, which could be expected to respond onsite, is captured under "local emergency services" and "local law enforcement." Local news media are not included in the category of local services personnel requiring periodic radiological orientation training. The OPPD Corporate Crisis Communication Plan provides guidance for the dissemination of information during an event at FCS. Principal points of contact with news media are also determined per the OPPD Corporate Crisis Communication Plan.

Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR Part 50, Appendix E, Section IV.A.3, the NRC staff concludes that the exempted language from Section IV.F.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.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, test the public alert and notification system, and ensure that emergency organization personnel are familiar with their duties.</p>
<p><u>Staff's Evaluation:</u></p> <p>Based on the analyses of 10 CFR 50.47(b) and 10 CFR Part 50 Appendix E, Section IV.D.3, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.F.2.a: 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 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.</p> <p>[F.2.a.(i), (ii), and (iii) are not applicable.]</p>
<p><u>Staff's Evaluation:</u></p> <p>The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to conduct a full participation exercise with State and local agencies is not needed. The licensee proposes in its exemption requests to continue to invite the State of Nebraska and Washington County to participate in the periodic drills and exercise conducted at FCS. The licensee would be exempt from 10 CFR Part 50, Appendix E, Section IV.F.2.a.(i)-(iii) because the licensee would be exempt from the umbrella provision of 10 CFR Part 50, Appendix E, Section IV.F.2.a.</p> <p>Based on above analysis and the analysis of 10 CFR 50.47(b), the NRC staff concludes that the exempted language from Section IV.F.2.a to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.F.2.b: Each licensee at each site shall conduct a subsequent exercise of its onsite emergency plan every 2 years. 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. In addition, the licensee shall take</p>

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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 and offsite impact of radiological releases, ~~protective action recommendation development, protective action decision making, plant system repair and mitigative action implementation.~~ 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, and the drills may focus on the onsite exercise training objectives.

Staff's Evaluation:

The intent of submitting exercise scenarios at an operating power reactor site in advance is to check that licensees utilize different scenarios in order to prevent the preconditioning of responders at power reactors. For decommissioning power reactor sites, there are limited events that could occur, and as such, the submittal of exercise scenarios for the purpose of ensuring that responders do not get preconditioned to certain scenarios is not necessary to achieve the underlying purpose of the rule.

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, drills involving principle functional areas associated with formal offsite REP are not needed. As discussed previously in Sections for 10 CFR Part 50, Appendix E, Sections IV.E.8.a.(i) and IV.8.a.(ii), there is no need for an OSC, TSC, or EOF to meet the underlying purpose of the rule.

Based on the above analysis and the analyses of 10 CFR 50.47(b), 10 CFR Part 50, Appendix E, Section IV.E.a(i), 10 CFR Part 50, Appendix E, Section IV.E.8.a(ii), and 10 CFR Part 50, Appendix E, Section IV.F.2.a, the NRC staff concludes that the exempted language from Section IV.F.2.b to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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~~

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~~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:~~

- ~~(1) Conduct an exercise biennially of its onsite emergency plan;~~
- ~~(2) Participate quadrennially in an offsite biennial full or partial participation exercise;~~
- ~~(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;~~
- ~~(4) Conduct a hostile action exercise of its onsite emergency plan in each exercise cycle; and~~
- ~~(5) Participate in an offsite biennial full or partial participation hostile action exercise in alternating exercise cycles.~~

Staff's Evaluation:

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to conduct a full participation exercise with State and local agencies is not needed.

Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR Part 50, Appendix E, Section IV.F.2.a, the NRC staff concludes that the exempted language from Section IV.F.2.c to Appendix E of 10 CFR Part 50, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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 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.~~

Staff's Evaluation:

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in

Table 1
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accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to ensure the State fully participate in the ingestion pathway portion of the exercise is not needed.

Additionally, the NRC excluded non-power reactors from the definition of "hostile action" at the time of the 2011 EP Final Rule 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. Like a non-power reactor, a decommissioning nuclear reactor also has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating nuclear reactor. For all of the above reasons, the NRC staff concludes that a decommissioning nuclear power reactor is not a facility that falls within the definition of "hostile action."

Based on the above analysis and the analyses of 10 CFR 50.47(b), 10 CFR Part 50, Appendix E, Section IV.1, and 10 CFR Part 50, Appendix E, Section IV.F.2.a, the NRC staff concludes that the exempted language from Section IV.F.2.d to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.F.2.e: Licensees shall enable any State or local Government located within the plume exposure pathway EPZ to participate in the licensee's drills when requested by such State or local government.

Staff's Evaluation:

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond design basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) and their associated EPZs are not needed. Therefore, identifying State and local governments in relation to a plume exposure pathway EPZ that is no longer required is not needed.

Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR 50.47(b)(1) the NRC staff concludes that the exempted language from Section IV.F.2.e to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.F.2.f: Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, 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. The extent of State and local participation in remedial exercises must be sufficient

<p style="text-align: center;">Table 1 Evaluation of Specific Exemptions to EP Requirements</p>
<p>to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.</p>
<p><u>Staff's Evaluation:</u></p> <p>As discussed previously for 10 CFR Part 50, Appendix E, Section IV.F.2.a., the requirement to conduct a full participation exercise with State and local agencies is not needed. Since full participation emergency plan exercises are not required and FEMA does not have responsibilities related to onsite emergency preparedness, NRC consultation with FEMA is not necessary.</p> <p>Based on the above analysis and the analyses of 10 CFR 50.47(b) and 10 CFR Part 50, Appendix E, Section IV.F.2.a, the NRC staff concludes that the exempted language from Section IV.F.2.f to Appendix E of 10 CFR Part 50 above is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.F.2.i: Licensees shall use drill and exercise scenarios that provide reasonable assurance that anticipatory responses will not result from preconditioning of participants. Such scenarios for nuclear power reactor licensees must include a wide spectrum of radiological releases and events, including hostile action. Exercise and drill scenarios as appropriate must emphasize coordination among onsite and offsite response organizations.</p>
<p><u>Staff's Evaluation:</u></p> <p>The NRC staff previously evaluated the issues of preconditioning drill scenarios and including hostile action scenarios at decommissioning plants for 10 CFR Part 50, Appendix E, Sections IV.F.2.a and IV.1, respectively, of this safety evaluation. In each instance, the NRC staff concluded that the exempted words were not needed to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p> <p>Based on the above analysis and the analyses of 10 CFR 50.47(b) 10 CFR Part 50, Appendix E, Section IV.1 and 10 CFR Part 50, Appendix E, Section IV.F.2.a, the NRC staff concludes that the exempted language from Section IV.F.2.i to Appendix A of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).</p>
<p>10 CFR Part 50, Appendix E, Section IV.F.2.j: The exercises conducted under paragraph 2 of this section by nuclear power reactor licensees must provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to implement the principal functional areas of emergency response identified in paragraph 2.b of this section. Each exercise must provide the opportunity for the ERO to demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF, and joint information center. Additionally, in each 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,</p>

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~~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.~~

Staff's Evaluation:

In the SOC for the 2011 EP Final Rule, the NRC discussed the addition of a new Section IV.F.2.j to Appendix E to require all nuclear power reactor licensees to provide an opportunity for the ERO to demonstrate proficiency in response to a wide spectrum of scenarios, including a "hostile action" and a loss of large areas of the plant due to fire or explosion. The NRC staff previously evaluated the need for hostile action enhancements previously for 10 CFR Part 50, Appendix E, Section IV. 1. Section IV.F.2.j further provides that the ERO must demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF and joint information center. The NRC staff previously concluded that the functions of the control room, EOF, TSC, and the OSC may be combined into one or more locations 10 CFR Part 50, Appendix E, Sections IV.E.8.a.(i), IV.E.8.a.(ii) and IV.E.9.d. A dedicated joint information center is also not needed based on the analysis previously for 10 CFR 50.47(b)(7). At a decommissioning site, where only the SFP and its related support systems, structures, and components remain, there are no other facilities in which ERO personnel could demonstrate proficiency.

Based on the above analysis and the analyses of 10 CFR 50.47(b), 10 CFR Part 50, Appendix E, Section IV.1, 10 CFR Part 50, Appendix E, Section IV.E.8.a(i) 10 CFR Part 50, Appendix E, Section IV.E.8.a(ii), 10 CFR Part 50, Appendix E, Section IV.E.9.d, and 10 CFR Part 50, Appendix E, Section IV.F.2.b, the NRC staff concludes that the exempted language from Section IV.F.2.j to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

10 CFR Part 50, Appendix E, Section IV.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.~~

Staff's Evaluation:

Based on the analysis of 10 CFR Part 50, Appendix E, Section IV.1, the NRC staff concludes that the enhancements for hostile actions, as required by the 2011 EP Final Rule, are not necessary for FCS in its permanently shutdown and defueled status. Therefore, the exempted language from Section IV.I to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

ENCLOSURE 2

SAFETY EVALUATION RELATED TO
OMAHA PUBLIC POWER DISTRICT
FORT CALHOUN STATION, UNIT NO. 1
REQUEST FOR EXEMPTIONS FROM PORTIONS OF
10 CFR 50.47 AND 10 CFR PART 50, APPENDIX E



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUEST FOR EXEMPTIONS FROM PORTIONS OF

10 CFR 50.47 AND 10 CFR PART 50, APPENDIX E

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT NO. 1

DOCKET NO. 50-285

1.0 INTRODUCTION

Fort Calhoun Station, Unit No. 1 (FCS), is a decommissioning power reactor located on approximately 660 acres midway between Fort Calhoun and Blair, Nebraska, on the west bank of the Missouri River, with an additional exclusion area of 582 acres on the northeast bank of the river, directly opposite the plant buildings. Omaha Public Power District (OPPD, the licensee) is the holder of the Renewed Facility Operating License No. DPR-40, issued pursuant to the Atomic Energy Act of 1954, as amended, and Part 50, "Domestic Licensing of Production and Utilization Facilities," of Title 10 of the *Code of Federal Regulations* (10 CFR), authorizing the licensee to possess and store spent nuclear fuel and greater-than-Class C radioactive waste at the permanently shutdown and defueled FCS facility.

By letter dated June 24, 2016 (Reference 1), pursuant to 10 CFR 50.82(a)(1)(i), OPPD certified to the U.S. Nuclear Regulatory Commission (NRC) that it planned to cease power operations at FCS by December 31, 2016. By letter dated August 25, 2016 (Reference 2), OPPD supplemented its June 24, 2016, letter updating its prior certification to the NRC, pursuant to 10 CFR 50.82(a)(1)(i), of its intention to permanently cease power operations at the FCS facility on October 24, 2016.

By letter dated November 13, 2016 (Reference 3), OPPD submitted a certification to the NRC, pursuant to 10 CFR 50.82(a)(1)(ii), that all spent fuel had been permanently removed from the FCS reactor vessel and placed in the FCS spent fuel pool (SFP). Upon the docketing of the certifications, the 10 CFR Part 50 license for FCS no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Spent fuel is currently stored on site in the FCS SFP and a dry cask independent spent fuel storage installation (ISFSI) at the FCS facility.

By letter dated December 16, 2016 (Reference 4), and as supplemented by letters dated February 10, April 14, and April 20, 2017 (References 5, 6, and 7, respectively), OPPD requested exemptions from specific emergency planning (EP) requirements of 10 CFR Part 50 for FCS. More specifically, OPPD requested exemptions from certain planning standards in

10 CFR 50.47(b) regarding onsite and offsite radiological emergency preparedness (REP) plans for nuclear power reactors; from certain requirements in 10 CFR 50.47(c)(2) for establishment of plume exposure pathway and ingestion pathway emergency planning zones (EPZs) for nuclear power reactors, and from certain requirements in 10 CFR Part 50, Appendix E, Section IV, "Content of Emergency Plans," which establishes the elements that make up the content of emergency plans. The licensee's requested exemptions would eliminate the requirements to maintain formal offsite REP plans in accordance with 44 CFR 350, "Review and Approval of State and Local Radiological Emergency Plans and Preparedness," and to reduce the scope of the onsite EP activities at FCS, based on the reduced risks of an offsite radiological release at FCS given its permanently shutdown and defueled status. The exemptions will maintain the requirements for an onsite radiological emergency plan and will continue to ensure the capability to communicate and coordinate with offsite response authorities. The NRC staff found the application complete, and the licensee's associated technical justification provides a basis for the Commission's consideration of the requested exemption.

In accordance with 10 CFR 50.12, "Specific exemptions," the licensee stated that this exemption request: (1) is authorized by law; (2) will not present an undue risk to the public health and safety; (3) is consistent with the common defense and security, and (4) meets the requirement for special circumstances in 10 CFR 50.12(a)(2).

1.1 Discussion

The regulations governing EP for nuclear power reactors are set forth in Section 50.47, paragraphs 50.54(q), (s) and (t), and Appendix E to 10 CFR Part 50. Every nuclear power reactor licensee must establish and maintain emergency plans and preparedness in accordance with these regulations. The EP regulations for an operating nuclear power reactor include standards for both onsite and offsite¹ emergency response plans. These regulations and the planning basis for EP are based upon an anticipated prompt response to a wide spectrum of events. However, for a decommissioning nuclear power reactor, the spectrum of accidents that can have significant offsite consequences is greatly reduced. At a decommissioning power reactor site, the only accident scenario that might lead to a significant radiological release is a highly unlikely, beyond-design-basis event resulting in a potential spent fuel zirconium cladding fire. This event involves a postulated major loss of water inventory from the SFP, where preplanned SFP mitigation measures were unsuccessful, generating a significant heat-up of the spent fuel to the point where substantial zirconium cladding oxidation and fuel damage can occur. The amount of decay heat present in irradiated fuel in the SFP is directly related to the amount of time that has passed after the reactor is shut down. As such, the potential for the conditions needed for a zirconium cladding fire to occur continues to decrease as a function of the time since the reactor was permanently shut down. However, current regulations do not reflect that: (1) considerably more time is available during decommissioning to respond to a postulated zirconium cladding fire incident than is available for many postulated operating power reactor accidents, and (2) comprehensive SFP mitigation measures and on-shift staff remain in place following the permanent cessation of power operations.

Since there are no explicit regulatory provisions distinguishing EP requirements for a nuclear power reactor that has permanently ceased operating from those for an operating nuclear power

¹ The offsite standards are reproduced in the Federal Emergency Management Agency's (FEMA) regulations at 44 CFR 350.5, "Criteria for review and approval of State and local radiological emergency plans and preparedness," and are based on the standards established by the Commission in 10 CFR 50.47.

reactor, licensees transitioning to or already in the decommissioning phase usually seek to establish a level of EP commensurate with the risk of a radiological emergency at a decommissioning site. Exemptions from certain EP requirements are typically requested early in the decommissioning process. The NRC reviews each request on a case-by-case basis and grants exemptions only after conducting a thorough analysis of each request. Historically, given the significant reduction in radiological risk from a decommissioning site, the NRC has approved exemptions from EP requirements based on site-specific evaluations and the objectives of the regulations. Between 1987 and 1999, the NRC issued exemptions from EP requirements for 10 licensees. More recently, exemptions from EP requirements have been granted for the Kewaunee Power Station; Crystal River Unit 3 Nuclear Plant; San Onofre Nuclear Generating Station, Units 2 and 3; and Vermont Yankee Nuclear Power Station (References 8, 9, 10, and 11, respectively).

Previously granted exemptions from EP regulations reduced the requirements for decommissioning power reactors to those consistent with these standards:

(1) 10 CFR 50.47(d), which states the requirements for a license authorizing fuel loading and low power testing only;² and (2) 10 CFR 72.32(a),³ which establishes the information required in an emergency plan for an ISFSI. Examples of previously granted exemptions from EP regulations for decommissioning power reactors include: setting the highest emergency classification level as an "Alert"; extending the timing requirements for notification of offsite authorities; requiring only onsite exercises with the opportunity for offsite response organization (ORO) participation; and only maintaining arrangements for OROs (i.e., law enforcement, fire and medical services) that might support the licensee's response to onsite emergencies.⁴ The EP exemptions also relieve the licensee from the requirement to maintain formal offsite REP plans, including the 10-mile plume exposure pathway and 50-mile ingestion pathway EPZs.

Licensees that have been granted EP exemptions must continue to maintain an onsite emergency plan addressing the classification of an emergency, notification of emergencies to licensee personnel and offsite authorities, and coordination with designated offsite government officials following an event declaration.

In evaluating EP exemptions requested by OPPD, specifically in relation to relieving the licensee from the requirement to maintain formal offsite REP plans, the NRC staff considered the conclusions from recent SFP studies completed since the publication of NUREG-1738,

² The regulations under 10 CFR 50.47(d) state, in part, "Notwithstanding the requirements of paragraphs (a) and (b) of this section, and except as specified by this paragraph, no NRC or FEMA review, findings, or determinations concerning the state of offsite emergency preparedness or the adequacy of and capability to implement State and local or utility offsite emergency plans are required prior to issuance of an operating license authorizing only fuel loading or low power testing and training (up to 5 percent of the rated thermal power)."

³ The Final Rule to 10 CFR Part 72, "Emergency Planning Licensing Requirements for Independent Spent Fuel Storage Facilities (ISFSI) and Monitored Retrievable Storage Facilities (MRS)" (60 *Federal Register* (FR) 32430; June 22, 1995), states that "the postulated worst-case accident involving an ISFSI has insignificant consequences to public health and safety. Therefore, the final requirements to be imposed on most ISFSI licensees reflect this fact, and do not mandate formal offsite components to their onsite emergency plans." It also states, "based on the potential inventory of radioactive material, potential driving forces for distributing that amount of radioactive material, and the probability of the initiation of these events, the Commission concludes that the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones."

⁴ Requirements for licensees to maintain agreements for fire-fighting and local law enforcement services exist outside of EP (i.e., the requirement for licensees to maintain a fire protection plan in 10 CFR 50.48, "Fire protection," and physical security requirements in 10 CFR Part 73).

"Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," February 2001 (Reference 12), which served as the technical basis for SECY-01-0100, "Policy Issues Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools," dated June 4, 2001 (Reference 13). In addition, the staff considered enhancements put into place as a result of the events of September 11, 2001, and the March 11, 2011, accident at Fukushima Dai-ichi. The studies support staff positions that only a highly unlikely, beyond-design-basis event (e.g., extreme earthquake or large aircraft impact) would cause sufficient structural damage to the SFP structure resulting in a rapid SFP water draindown and potential zirconium cladding fire. In addition, there would be a significant amount of time between the initiating event and the possible onset of conditions that could result in a zirconium cladding fire. This time provides a substantial opportunity for event mitigation. Licensees are required to maintain effective strategies, sufficient resources, and adequately trained personnel to mitigate such an event. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for OROs to implement these measures using a comprehensive, or "all-hazards," emergency management plan (CEMP) approach.⁵

Spent Fuel Pool Study Considerations

Following removal of spent fuel from the reactor vessel, the principal radiological risks are associated with the storage of spent fuel onsite. Generally, a few months after the reactor has been permanently shut down, there are no possible design-basis events that could result in a radiological release exceeding the U.S. Environmental Protection Agency (EPA), EPA 400/R 17/001, "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents," January 2017 (Reference 15), early phase protective action guide (PAG) limit of 1 roentgen equivalent man (rem) at the exclusion area boundary (EAB). The only potential accident that might lead to a significant radiological release at a decommissioning reactor is a zirconium cladding fire, which is a postulated, but highly unlikely, beyond-design-basis event scenario that involves a major loss of water inventory from the SFP, resulting in a significant heat-up of the spent fuel due to the loss of all cooling, and culminating in substantial zirconium cladding oxidation and fuel damage. The significance of spent fuel heat-up scenarios that might result in a zirconium cladding fire depends on the decay heat of the irradiated fuel stored in the SFP. The amount of decay heat in the spent fuel is directly associated with the amount of time since the reactor permanently ceased operations. Therefore, the probability of a zirconium cladding fire scenario continues to decrease as a function of the time that the decommissioning reactor has been permanently shut down.

The NRC staff assessed the risk of an SFP accident at decommissioning nuclear power plants in the late 1990s to support development of a risk-informed technical basis for review of exemption requests and a regulatory framework for integrated rulemaking. The staff's assessment, published in NUREG-1738, conservatively assumed that if the water level in the SFP did drop below the top of the spent fuel, resulting in a zirconium cladding fire involving all of the spent fuel would occur, and thereby bounded those conditions associated with air cooling of the fuel (including partial drain-down scenarios) and fire propagation. The study used simplified and sometimes bounding assumptions and models to characterize the likelihood and

⁵ A CEMP, in this context, also referred to as an emergency operations plan, is addressed in FEMA's Comprehensive Preparedness Guide 101, "Developing and Maintaining Emergency Operations Plans," Version 2.0, November 2010 (Reference 14).

consequences of beyond-design-basis SFP accidents. Even with these conservative assumptions, the study found the risk of an SFP fire to be low and well within the Commission's safety goals. The amount of time available (after complete fuel uncover) before a zirconium cladding fire also depends on various factors, including decay heat rate, fuel burnup, fuel storage configuration, building ventilation rates and air flow paths, and fuel cladding oxidation rates. Although NUREG-1738 did not completely rule out the possibility of a zirconium fire, it did demonstrate that storage of spent fuel in a high density configuration in SFPs is safe, and that the risk of accidental release of a significant amount of radioactive material to the environment is low.

After the events of September 11, 2001, Sandia National Laboratories conducted studies (collectively, referred to as the "Sandia studies"), which considered spent fuel loading patterns and other aspects of a pressurized-water reactor SFP and a boiling-water reactor SFP, including the role that the circulation of air plays in the cooling of spent fuel. These studies are non-publicly available because they contain security-related information. The Sandia studies indicated that there is a significant amount of time between the initiating event (i.e., the event that causes the SFP water level to drop) and the spent fuel assemblies becoming partially or completely uncovered. In addition, the Sandia studies indicated that for those hypothetical conditions where air cooling may not be effective in preventing a zirconium cladding fire, there is a significant amount of time between the spent fuel becoming uncovered and the possible onset of such a zirconium cladding fire, thereby providing a substantial opportunity for event mitigation. The Sandia studies, which account for relevant heat transfer and fluid flow mechanisms, also indicated that air-cooling of spent fuel could be sufficient to prevent SFP zirconium fires at a point much earlier following fuel offload from the reactor than previously considered (e.g., in NUREG-1738).

In 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 (Reference 16), the NRC evaluated the potential benefits of strategies required in 10 CFR 50.54(hh)(2). The study results for the analyzed severe earthquake at the reference plant are consistent with past studies' conclusions that SFPs are robust structures and likely to withstand severe earthquakes without leaking. The study showed that the likelihood of a radiological release from the spent fuel, after the analyzed severe earthquake at the reference plant, to be about one time in 10 million years or lower. If a loss of SFP water inventory resulting in a radiological release were to occur, this study shows that the individual cancer fatality risk for a member of the public is several orders of magnitude lower than the Commission's Quantitative Health Objective of two in one million (2×10^{-6} /year). As explained in NUREG-2161, successful implementation of mitigation strategies significantly reduces the likelihood of a release from the SFP in the event of a loss of cooling water. Additionally, the NRC found that the placement of spent fuel in a dispersed configuration in the SFP, such as the 1 x 4 pattern, would have a positive effect in promoting natural circulation, which enhances air coolability, and thereby further reducing the likelihood of a release from a completely drained SFP.

In 2014, the NRC documented a regulatory analysis of expediting the transfer of spent fuel assemblies in COMSECY-13-0030, "Staff Evaluation and Recommendation for Japan Lessons Learned Tier 3 Issue on Expedited Transfer of Spent Fuel," dated November 13, 2013 (Reference 17). The NRC staff concluded that SFPs are robust structures with large safety margins and recommended to the Commission that possible regulatory actions to require the expedited transfer of spent fuel from SFPs to dry cask storage were not warranted. The Commission subsequently approved the staff's recommendation in the Staff Requirements Memorandum to COMSECY-13-0030 dated May 23, 2014 (Reference 18).

To inform the current integrated decommissioning rulemaking effort, the NRC staff conducted an applied research study, as documented in a memorandum "Transmittal of Reports to Inform Decommissioning Plant Rulemaking for User Need Request 2015-001," dated May 31, 2016 (Reference 19), and concluded:

- The representative plant staff can reliably implement mitigation strategies to timely mitigate cask-drop events and prevent spent fuel heatup damage;
- Only the events causing a rapid SFP water draindown (e.g., extreme earthquake and large aircraft impact) would challenge the successful mitigation of fuel heatup; and
- In the unlikely, worst case beyond-design-basis event leading to a rapid draindown of the SFP and subsequent zirconium cladding fire, there exists additional time margin on the order of 1 to 8 hours beyond the 10-hour heatup time in which protective actions can be taken to protect the public before EPA PAGs would be exceeded offsite.

In addition, for this hypothetical event sequence considered in the study above, acute fatal effects offsite appear to be unlikely from either source term evaluated, provided that individuals can be relocated within a reasonable time after plume arrival. In most cases, this time was longer than 24 hours.

As previously stated, these studies (NUREG-1738, the Sandia studies, NUREG-2161, COMSECY-13-0030, and studies supporting the decommissioning rulemaking efforts) support the staff positions that:

- There would be sufficient time between the initiating event and the possible onset of conditions that could result in a zirconium cladding fire, which would provide a substantial opportunity for successful mitigation measures; and
- Only a highly unlikely, beyond-design-basis event (e.g., extreme earthquake or large aircraft impact) could cause sufficient structural damage to the SFP structure resulting in a potential zirconium cladding fire, and even in such cases, the fuel may be air coolable following a complete draindown.

As such, the NRC staff believes that for all but the most unlikely events, any offsite protective actions, if taken, would be implemented by governmental officials as a precautionary measure. In the unlikely event of a beyond-design-basis event resulting in a loss of all SFP cooling, there would be time to initiate appropriate SFP mitigating actions. If, in their judgement, State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for OROs to implement these measures using a CEMP, "all-hazards," approach.

Hostile Action-Based Event Considerations

The NRC regulatory activities and studies have reaffirmed the safety and security of spent fuel stored in pools and shown that SFPs are effectively designed to prevent accidents and minimize damage from malevolent attacks. In the wake of the terrorist attacks of September 11, 2001, the NRC took several actions to further reduce the possibility of an SFP zirconium cladding fire. The NRC issued Order EA-02-026, "Order for Interim Safeguards and Security Compensatory Measures," dated February 25, 2003 (Reference 20), which required licensees to immediately

implement additional security measures, including increased patrols, augmented security forces and capabilities, and more restrictive site-access controls to reduce the likelihood of an SFP accident, resulting from a terrorist-initiated event. The NRC's regulatory actions after the terrorist attacks of September 11, 2001, have significantly enhanced the safety of SFPs. A comprehensive discussion of these actions, some of which specifically address SFP safety and security, is provided in the NRC memorandum to the Commission, entitled "Documentation of Evolution of Security Requirements at Commercial Nuclear Power Plants with Respect to Mitigation Measures for Large Fires and Explosions," dated February 4, 2010 (Reference 21).

Licensees develop strategies in order to protect against the NRC design-basis threat⁶ for radiological sabotage and are required to maintain these strategies under the provisions of 10 CFR 73.55(b) until the termination of their Part 50 (or Part 52) license. In addition, other Federal agencies, such as the Federal Aviation Administration, the Federal Bureau of Investigation, and the Department of Homeland Security, have taken aggressive steps to prevent terrorist attacks in the United States. Taken as a whole, these systems, personnel, and procedures provide reasonable assurance that public health and safety, the environment, and the common defense and security will be adequately protected (73 FR 46204, 46207; August 8, 2008).

Mitigative Action Considerations

The NRC Order EA-02-026 (Reference 20) established new requirements for licensees to have mitigating strategies for large fires or explosions at nuclear power plants that may result in the loss of SFP water inventory. In response, the Nuclear Energy Institute (NEI) provided detailed guidance in NEI 06-12, Revision 2, "B.5.b Phase 2 & 3 Submittal Guideline," December 2006 (Reference 22), which the NRC endorsed on December 22, 2006 (not publicly available because it contains security-related information). The NRC found the NEI guidance to be an effective means for mitigating the potential loss of large areas of the plant due to fires or explosions. In addition, these strategies enhanced spent fuel coolability and the potential to recover SFP water level and cooling prior to a potential SFP zirconium cladding fire, which further reduced the probability of a radiological release from an SFP zirconium cladding fire oxidation.

Through NRC's issuance of the final rule, "Power Reactor Security Requirements," on March 27, 2009 (74 FR 13926), the requirements in NRC Order EA-02-026 were made generically-applicable. In that final rule, the NRC added 10 CFR 50.54(hh)(2) to require licensees to implement mitigating measures to maintain or restore SFP cooling capability in the event of loss of large areas of the plant due to fires or explosions, which further decreases the probability of an SFP zirconium cladding fire. Under 10 CFR 50.54(hh)(2), power reactor licensees are required to implement strategies such as those provided in NEI 06-12, Revision 2.⁷

⁶ The design-basis threat represents the largest threat against which a private sector facility can be reasonably expected to defend, with high assurance. The NRC's design-basis threat rule was published in the *Federal Register* on March 19, 2007 (72 FR 12705).

⁷ The guidance in NEI 06-12 specifies that portable, power-independent pumping capabilities must be able to provide at least 500 gallons per minute (gpm) of bulk water makeup to the SFP, and at least 200 gpm of water spray to the SFP. Recognizing that the SFP is more susceptible to a release when the spent fuel is in a non-dispersed configuration, the guidance also specifies that the portable equipment is to be capable of being deployed within 2 hours for a non-dispersed configuration.

Furthermore, other organizations, such as Sandia National Laboratories, as discussed previously under “Spent Fuel Pool Considerations,” have confirmed the effectiveness of the additional mitigation strategies to maintain spent fuel cooling in the event that the pool is drained and its initial water inventory is reduced or lost entirely. The findings of Sandia National Laboratories, known as the “Sandia studies,” are sensitive, security-related information and are not available to the public.

In response to the Fukushima Dai-ichi Accident, the NRC implemented regulatory actions to further enhance reactor and SFP safety. On March 12, 2012, the NRC issued Order EA-12-049, “Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events” (Reference 23), which requires licensees to develop, implement, and maintain guidance and strategies to maintain or restore SFP cooling capabilities, independent of normal alternating current power systems, following a beyond-design-basis external event. In addition, on March 12, 2012, the NRC issued Order EA-12-051, “Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation” (Reference 24), which requires that licensees install reliable means of remotely monitoring wide-range SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event. Although the primary purpose of the order was to ensure that operators were not distracted by uncertainties related to SFP conditions during the accident response, the improved monitoring capabilities will help in the diagnosis and response to potential losses of SFP integrity. These requirements ensure a more reliable and robust mitigation capability is in place to address degrading conditions in SFPs resulting from certain significant but unlikely events.

Offsite Radiological Emergency Preparedness Considerations

The NRC staff determined, based on EP exemption evaluation criteria previously discussed, that in the event of a beyond-design-basis event impacting SFP integrity or the ability to cool spent fuel, the licensee will maintain sufficient resources and adequately trained personnel available on-shift to promptly initiate mitigative actions without the support of OROs. In the highly unlikely event of a zirconium cladding fire in the SFP, due to a beyond-design-basis event that results in the loss of all spent fuel cooling, sufficient time would exist for OROs to implement protective measures, if warranted, using a CEMP, “all-hazards,” approach. Therefore, the NRC staff concluded, consistent with previous exemption requests, that formal offsite REP plans, required under 10 CFR Part 50, are not necessary for permanently shutdown and defueled nuclear power reactor licensees once the evaluation criteria outlined in Section 5, “Evaluation of Exemptions to EP Regulations,” of the Office of Nuclear Security and Incident Response (NSIR), Division of Preparedness and Response (DPR) Interim Staff Guidance (ISG) document NSIR/DPR-ISG-02, “Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants,” dated May 11, 2015 (Reference 25), have been addressed.

In addition, consistent with the December 7, 2015, “Memorandum of Understanding Between the Department of Homeland Security/Federal Emergency Management Agency and Nuclear Regulatory Commission Regarding Radiological Response, Planning and Preparedness” (Reference 26), provided a draft of SECY-17-0080 containing the NRC staff’s analysis of these exemptions to FEMA for review and comment, as documented in an NRC letter dated May 31, 2017 (Reference 27). In a letter dated June 12, 2017 (Reference 28), FEMA provided the following statement that supports granting the exemption:

FEMA Headquarters and Region VII consulted with the Nebraska Emergency Management Agency (NEMA) and Iowa Homeland Security and Emergency

Management Division (IHSEMD) concerning this exemption request. Neither state anticipates any significant reduction in response capabilities at the state or local levels due to the Fort Calhoun Station decommissioning, nor do the states expect to lose any full time employees or other staffing capabilities. There may be some budget reallocation required to address some funding areas (namely salaries), but there is no anticipation of any loss or noticeable reduction of response capabilities.

The licensee would still be required to maintain an onsite emergency plan, which would provide for the notification of, and coordination with, offsite organizations, to an extent commensurate with the approved exemptions. Licensee requirements for offsite fire services and law enforcement responding onsite will continue to be maintained under the licensee's fire protection plan and physical security plan in accordance with 10 CFR 50.48 and 10 CFR Part 73, respectively.

The NRC staff proposed an evaluation of OPPD's exemption request to the Commission in SECY-17-0080, "Request by Omaha Public Power District for Exemptions from Certain Emergency Planning Requirements for the Fort Calhoun Station, Unit 1," dated August 10, 2017 (Reference 29), which was approved by the Commission in the SRM to SECY-17-0080, dated October 25, 2017 (Reference 30).

2.0 REGULATORY EVALUATION

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 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.⁸ The underlying purposes of the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements of Section IV to Appendix E of 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; to establish plume exposure and ingestion pathway EPZs for nuclear power plants, and to ensure that licensees maintain effective offsite and onsite radiological emergency response plans.

The NRC staff relied on past precedent to assess whether the OPPD request for EP exemptions satisfied the underlying purposes of the EP regulations. As discussed previously, the exemptions requested by OPPD for the FCS that would eliminate requirements for formal offsite REP plans are consistent with those recently approved by the NRC for the Kewaunee Power Station; Crystal River Unit 3 Nuclear Plant; San Onofre Nuclear Generating Station, Units 2 and 3; and Vermont Yankee Nuclear Power Station. Prior to these sites, the last approved exemption that eliminated the requirements for formal offsite REP planning was for the Zion Nuclear Power Station in 1999 (Reference 31).

The NRC staff recognizes that the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements in Section IV to Appendix E of 10 CFR 50, were developed taking into consideration the risks associated with accidents that have the potential

⁸ 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.

for significant offsite radiological dose consequences during operation of a nuclear power reactor at its licensed full-power level. As discussed previously, the NRC staff has concluded that after a reactor has permanently shut down and defueled, the risks associated with accidents that have a potential for offsite radiological release, are significantly reduced for those licensees that are reasonably aligned with the analyses presented in NUREG-1738. This position has been further informed by recent SFP studies provided in NUREG-2161.

Based on the low risk of postulated beyond-design-basis events resulting in a loss of SFP integrity or cooling to the spent fuel that may result in significant offsite radiological consequences, the NRC staff considers that the special circumstances condition of 10 CFR 50.12(a)(2)(ii) can be met by demonstrating that FCS satisfies the two criteria provided below. Specifically, the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements in Section IV to Appendix E of 10 CFR 50, from which OPPD has requested exemptions, would not serve or be necessary to achieve the underlying purpose of the EP regulations if the FCS site-specific analyses demonstrate that:

1. An offsite radiological release will not exceed the EPA early phase PAGs at the EAB⁹ for a design-basis accident; and
2. In the unlikely event of a beyond-design-basis event, resulting in a loss of all modes of cooling for the spent fuel stored in the SFP, there is a minimum of 10 hours for the hottest fuel assembly to reach 900 degrees Celsius (°C), which is the critical temperature threshold for a self-sustained oxidation of zirconium cladding in air. This time provides a substantial opportunity for event mitigation. Licensees are required to maintain effective strategies, sufficient resources and adequately trained personnel to mitigate such an event. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for OROs to implement these measures using a CEMP, "all-hazards," approach.

Previously granted exemptions from EP regulations reduced the level of EP, consistent with the regulations for a licensee authorizing fuel loading and low power testing only, as specified in the standards of 10 CFR 50.47(d), and is consistent with the information requirements for an ISFSI emergency plan, as required by 10 CFR 72.32(a). Examples of the reduced EP requirements include: setting the highest emergency classification level as an "Alert"; extending the timing requirements for notification of offsite authorities; requiring only onsite exercises with the opportunity for ORO participation, and only maintaining arrangements for the OROs (i.e., law enforcement, fire and medical services) that may respond to onsite emergencies. No formal offsite REP plans in accordance with 44 CFR 350 were required after the exemptions were granted for these licensees.

As part of its review and evaluation of OPPD's exemption request, the NRC staff used NSIR/DPR-ISG-02, and also used the EP regulations in 10 CFR 72.32 and the guidance in Spent Fuel Project Office Interim Staff Guidance (ISG) – 16, "Emergency Planning," dated June 14, 2000 (Reference 33), as references to ensure consistency between specific-licensed and general-licensed ISFSIs. Furthermore, the licensee addressed the Industry

⁹ Use of EPA PAGs as a threshold is consistent with the planning basis for the 10-mile EPZ provided in NUREG-0396 (EPA 520/1-78-016), "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," December 1978 (Reference 32), and endorsed by the Commission in a policy statement published on October 23, 1979 (44 FR 61123).

Decommissioning Commitments (IDCs) and Staff Decommissioning Assumptions (SDAs)¹⁰ that formed the basis of the analyses presented in NUREG-1738.

3.0 TECHNICAL EVALUATION

The following NRC staff evaluation verifies that OPPD provided the seven analyses suggested in Section 5, "Evaluation of Exemptions to Emergency Planning Regulations," of NSIR/DPR-ISG-02, and these analyses meet the criteria in the ISG to justify elimination of the requirement on the licensee to maintain EPZs and formal offsite REP plans and preparedness.

1. The licensee has performed an analysis indicating that any radiological release from applicable design-basis accidents would not exceed the limits of the EPA early phase PAGs at the EAB.

The licensee has stated, and the NRC staff agrees, that while spent fuel remains in the SFP, the only postulated design-basis accident that will remain applicable to the permanently defueled FCS that could contribute a significant dose is a fuel handling accident (FHA) in the Auxiliary Building, where the SFP is located. For completeness, the staff also evaluated the applicability of other design-basis accidents, as documented in the FCS Updated Safety Analysis Report (USAR), to ensure that these accidents would not have consequences that could potentially trigger the EPA PAGs. These additional evaluations include a spent fuel cask drop accident, a gas decay tank rupture, and a waste liquid incident.

Fuel Handling Accident – In the FCS USAR, the licensee has determined that within 10 days after shutdown, the FHA doses would decrease to a level that would not warrant protective actions under the EPA PAG framework.

The NRC staff notes that the doses from an FHA are dominated by the isotope Iodine 131. The licensee has based its application for revision to the emergency plan and emergency action level (EAL) scheme on an effective implementation date of April 7, 2018. The date of cessation of power operations occurred on October 24, 2016. Therefore, by the date of implementation of the revised emergency plan and EAL scheme, the fuel will have decayed for 530 days. With 530 days of decay, the thyroid dose from an FHA would be negligible. After 530 days of decay, the only isotope remaining in significant amounts, among those postulated to be released in an FHA, would be Krypton 85. Since Krypton 85 primarily decays by beta emission, the calculated skin dose from an FHA analysis would make an insignificant contribution to the total effective dose equivalent, which is the parameter of interest in the determination of the EPA PAGs for sheltering or evacuation. The staff concludes that the dose consequence from an FHA for the permanently defueled FCS would not approach the EPA early phase PAGs.

¹⁰ Refers to IDCs proposed by NEI in a letter to the NRC dated November 12, 1999 (Reference 34), and several additional SDAs identified through the staff's risk assessment and the staff's evaluation of the safety principles for decommissioning plants in Regulatory Guide 1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," May 2011 (Reference 35). The IDCs and SDAs are summarized in Tables 4.2-1 and 4.2-2 of NUREG-1738.

Spent Fuel Cask Drop Accident – In the FCS USAR Section 14.24, “Heavy Load Incident,” the licensee states:

The Auxiliary Building Crane with its main hook is used to move the spent fuel casks into the spent fuel pool. The capacity of the crane lifting system using the main hook is 106 tons to accommodate the proposed ISFSI spent fuel casks (Reference 14.24.9-5 [“EC 41654, Upgrade of Auxiliary Building Crane HE-2” (licensee document)]). The design of this lifting system is single failure proof. Therefore, the likelihood of dropping the spent fuel casks into the spent fuel pool or in the auxiliary building is extremely low.

The NRC staff concludes that due to the fact that the FCS Auxiliary Building Crane is licensed as being single-failure-proof, a spent fuel cask drop accident is not considered a credible accident for the permanently defueled FCS.

Waste Gas Decay Tank Rupture – After 530 days of decay, the only isotope remaining in significant amounts, among those postulated to be released from a waste gas decay tank rupture, would be Krypton 85. As was the case for an FHA, the resulting skin dose from the release of Krypton 85 would make an insignificant contribution to the total effective dose equivalent, which is the parameter of interest in the determination of EPA early phase PAGs for sheltering or evacuation. Therefore, the NRC staff concludes that the dose consequence from a waste gas decay tank rupture for the permanently defueled FCS will not approach the EPA PAGs for sheltering or evacuation.

Waste Liquid Incident – The FCS radioactive waste disposal system is designed such that any spillage or leakage of radioactive liquid waste would be retained within the facility. As described in the FCS USAR, administrative controls, multiple valving, fail-safe features, and reliable instrumentation and controls provide assurance against the release of radioactive liquid waste to the environment in excess of 10 CFR Part 20, “Standards for Protection Against Radiation,” limits.

After 530 days of decay, the only isotope remaining in significant amounts, among those postulated to be released from the gaseous release associated with a liquid waste tank failure, would be Krypton 85. As was the case for an FHA, the resulting skin dose from the release of Krypton 85 would make an insignificant contribution to the total effective dose equivalent, which is the parameter of interest in the determination of EPA PAGs for sheltering or evacuation. Therefore, the NRC staff concludes that the dose consequence from a liquid waste tank failure for the permanently defueled FCS will not approach the EPA PAGs for sheltering or evacuation.

2. The licensee has performed an analysis demonstrating that, with a complete loss of SFP water inventory with no heat loss (adiabatic heatup), a minimum of 10 hours would be available before any fuel cladding temperature reaches 900 °C from the time all cooling is lost.

The 10-hour criterion, conservatively, does not take into account the fuel uncover time and assumes instantaneous loss of cooling to the fuel. 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. The 10 hours is a conservative period of time in which pre-planned mitigation measures to provide makeup water or spray to the SFP can be

reliably implemented before the onset of a zirconium cladding ignition, in the event a release is projected to occur, 10 hours would be sufficient time for offsite agencies to take appropriate protective actions to protect the health and safety of the public.

In Attachment 2 to the licensee's exemption request letter dated December 16, 2016, the licensee provided a site-specific quantitative analysis to determine the time for the hottest fuel assembly to heat adiabatically from its normal storage temperature to a temperature of 900 °C. The licensee presented its evaluation of the response of the hottest fuel assemblies under conditions where the heat generated within the assembly would be retained within the assembly. The licensee calculated the heat-up time by dividing the heat necessary to raise the temperature of the heated length of the fuel, fuel cladding, and guide tube material from approximately 60 °C to 900 °C by the decay heat rate of the fuel. Based on this calculation, the licensee determined that after 18 months of decay, the time for the fuel assembly to reach 900 °C would exceed 10 hours. Through interpolation that between the results for 17 and 18 months decay, the licensee also determined that the heatup time would reach 10 hours after 1 year and 165 days decay from the time of shut down, which would equate to April 7, 2019.

The NRC staff reviewed the calculation and determined that important physical properties of materials were within acceptable ranges and the results were accurate. The staff also completed independent confirmatory calculations that produced similar results. Therefore, the staff finds that after 1 year and 165 days decay, more than 10 hours would be available before a significant offsite release could begin. The staff concludes that the adiabatic heat-up calculation provided an acceptable method for determining the minimum time available for deployment of mitigation equipment and, if necessary, implementing measures under a CEMP, "all-hazards," approach.

3. The licensee has performed an analysis demonstrating that radiation exposure resulting from a loss of SFP water inventory would be less than EPA early phase PAGs at the EAB and less than 15 millirem per hour (mrem/hour) in the control room.

The licensee analyzed the radiological consequences of a beyond-design-basis event scenario to evaluate the effects of a loss of water inventory from the FCS SFP. The primary purpose of this calculation is to determine the dose rates as a function of time at the EAB and in the control room due to loss of shielding for an event in which the spent fuel assemblies are uncovered following a loss of SFP water inventory (drain down). The dose rates determined by this calculation are due to direct and indirect radiation from spent fuel assemblies. The NRC staff notes that while the direct dose rate above the unshielded fuel would be high, FCS radiation protection personnel would restrict access to insure that no one was subjected to the direct dose from the unshielded fuel.

The licensee determined that the integrated external dose at the EAB, assuming continuous exposure, would be well within the 10 CFR 20.1302(b)(ii), "Compliance with dose limits for individual members of the public," limit of 50 mrem in a year for an individual continuously present in an unrestricted area. The licensee did not credit any actions that could be taken to reduce the source such as refilling the SFP. In addition, the licensee determined that the control room dose rate would be insignificant (less than 1 mrem/hour).

The NRC staff reviewed the licensee's evaluation and performed independent analyses, which confirmed the licensee's results.

4. Considering the site-specific seismic hazard, the licensee has performed either an evaluation demonstrating a high confidence of a low probability (less than 1×10^{-5} per year) of seismic failure of the SFP storage 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 °C (the point of incipient cladding damage).

The licensee completed a seismic evaluation in response to a request for information pursuant to the requirements of 10 CFR 50.54(f) regarding Recommendation 2.1 of the NRC's Near-Term Task Force Review of insights from the Fukushima Dai-ichi Accident, "Recommendations for Enhancing Reactor Safety in the 21st Century," dated July 12, 2011 (Reference 36). The licensee performed the seismic evaluation consistent with NRC-endorsed guidance in the Electric Power Research Institute (EPRI), EPRI 3002007148, "Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation," February 2016 (Reference 37). In its letter, "Spent Fuel Pool Evaluation Supplemental Report, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident," dated May 25, 2016 (Reference 38), OPPD determined that the SFP value for high confidence of low probability of failure for the once-per-100,000-year hazard level satisfies the pool performance guideline specified in NUREG-1738. The NRC's review of this evaluation is available in "Fort Calhoun Station, Unit 1 - Staff Review of Spent Fuel Pool Evaluation Associated with Reevaluation Seismic Hazard Implementing Near-Term Task Force Recommendation 2.1," dated August 4, 2016 (Reference 39). Therefore, the plant-specific seismic risk assessment results are acceptable for FCS.

5. If the licensee is storing fuel in an SFP, the licensee should address, for the decommissioning site, the risk-reduction measures identified as industry IDCs and SDAs in NUREG-1738.

In accordance with the safety analysis in NUREG-1738, the beyond-design-basis event sequences that dominate risk at a decommissioning power reactor are 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.

Assurance that the results of the NUREG-1738 analysis are representative of the plant-specific conditions at FCS can be established by assessing the facility against certain design and operational characteristics that were assumed in the NUREG-1738 analysis. These characteristics were identified in the NUREG-1738 study as recovery, mitigation, and emergency response activities assumptions that were relied on to evaluate the likelihood of success in event sequences. In Section 4.5 and Table 4 of Attachment 1 to the application dated December 16, 2016, the licensee described the conformance of the FCS facility and operations with the IDCs and the SDAs. In the licensee's discussion of the IDCs and SDAs, the licensee addressed measures in place to minimize the potential risk from event sequences that dominate risk at a decommissioning reactor with fuel stored in an SFP (e.g., those IDCs and SDAs related to fuel cask handling activities and seismic events). In Attachment 1 of its letter dated April 20, 2017, the licensee provided additional information related to SFP temperature and level instrumentation.

In order to help ensure continued conformance with the IDCs and SDAs, the licensee included the following regulatory commitment as Attachment 6 to the December 16, 2016, request for exemption from certain portions of the NRC EP regulations:

Revise the USAR to include a description of how the FCS Spent Fuel Pool design and operational characteristics meets or compares with the NUREG-1738 Industry Decommissioning Commitments (IDCs) and staff Decommissioning Assumptions (SDAs).

The NRC staff evaluation focuses on the licensee's conformance with IDCs and SDAs that are related to the design and operation of structures, systems, and components associated with the SFPs. The following provides a summary of the staff's findings, based on an assessment of the licensee's IDC and SDA items:

IDC #1: Cask drop analyses will be performed or single-failure-proof cranes will be used for handling of heavy loads (i.e., phase II of [NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants: Resolution of Generic Technical Activity A-36," July 1980 (Reference 40),] will be implemented).

To provide for safe handling of heavy loads in the vicinity of the SFP, the licensee has maintained equipment and procedures for handling heavy loads that comply with NUREG-0612 guidelines for single-failure-proof handling systems. Section 14.24 of the FCS USAR describes that the Auxiliary Building Crane main hook is used to move fuel storage casks into and out of the SFP and this handling system is single-failure-proof. The NRC staff finds that the qualification and operation of the FCS Auxiliary Building Crane as a single-failure-proof handling system satisfies the conditions assumed in the analysis presented in NUREG-1738 with respect to protection from potential cask drop events.

IDC #2: Procedures and training of personnel will be in place to ensure that onsite and offsite resources can be brought to bear during an event.

IDC #3: Procedures will be in place to establish communication between onsite and offsite organizations during severe weather and seismic events.

IDC #4: An offsite resource plan will be developed which will include access to portable pumps and emergency power to supplement onsite resources. The plan would principally identify organizations or suppliers where offsite resources could be obtained in a timely manner.

In Table 4, "Industry Decommissioning Commitments (IDCs) Comparison," of Attachment 1 of the application dated December 16, 2016, the licensee listed and described how various plant procedures would provide for deployment of onsite resources and access to offsite resources, including provisions for training, communications, and coordination to obtain offsite resources. Therefore, the NRC staff concludes the licensee has adequate procedures to satisfy the conditions assumed in

the NUREG-1738 analysis regarding effective use of onsite and offsite resources to respond to events affecting the SFP.

IDC #5: SFP instrumentation will include readouts and alarms in the control room (or where personnel are stationed) for SFP temperature, water level, and area radiation levels.

In Table 4 of Attachment 1 of the application dated December 16, 2016, the licensee described that the SFP instrumentation included instruments, indicators, and alarms for SFP water level, temperature, and radiation levels. The SFP water level is monitored each shift using an installed back-pressure bubbler-type level instrument with indication on the outside wall of the SFP. A separate differential pressure instrument provides an alarm in the control room for both high and low SFP levels. In addition, other wide-range SFP instrumentation was installed in 2016 that can provide indication of the SFP level in several locations, and that instrumentation is used for emergency classification. The SFP water temperature indication in the control room is provided from an instrument in the SFP cooling system piping, which also provides an alarm in the control room. Additional temperature instrument readings from various elevations within the SFP are available for display on the emergency response facility computer. Area radiation levels can be monitored using indication and alarms available in the control room. Therefore, the NRC staff finds that the licensee will maintain adequate SFP monitoring instrumentation to satisfy the conditions assumed in the NUREG-1738 analysis regarding monitoring events affecting the SFP.

IDC #6: SFP seals that could cause leakage leading to fuel uncover in the event of seal failure shall be self-limiting to leakage or otherwise engineered so that drainage could not occur.

The FCS SFP has one gate, which separates the SFP from the transfer canal. The licensee described that the gate tapers from top to bottom and is passively sealed by a rubber gasket between the gate and the pool liner. The bottom of the gate opening is located at the same elevation as the top of the fuel seated in the storage racks, and a plate has been installed across the bottom of the opening to raise the minimum elevation the pool could reach to approximately 1 foot above the stored fuel in the unlikely event of gate seal failure. Therefore, the configuration of the gate openings limits the potential leakage from the storage pool. The NRC staff finds that the described design features that limit the potential for drainage through the gate openings are consistent with the assumptions used in the analysis presented in NUREG-1738.

IDC #7: Procedures or administrative controls to reduce the likelihood of rapid draindown events will include (1) prohibitions on the use of pumps that lack adequate siphon protection or (2) controls for pump suction and discharge points. The functionality of anti-siphon devices will be periodically verified.

In Table 4 of Attachment 1 of the application dated December 16, 2016, the licensee described procedures and design elements that reduce the likelihood of a rapid draindown event. The licensee described general work process procedures controlling work to maintain safety. The licensee also described the design and operation of the SFP cooling system, which has an upper and lower suction line. The licensee administratively controls the status of the lower SFP cooling system suction line as

locked in the closed position to reduce the likelihood of rapid and significant drainage. If the lower suction valve was inadvertently opened, the upper suction line would break vacuum to limit the drainage. Regardless, the lower suction line elevation is approximately 3 feet above the top of the stored fuel. The SFP cooling system discharge piping terminates approximately 23 feet above the stored fuel and contains a drilled hole to break vacuum and prevent siphon flow. The NRC staff finds that the described procedures and design features minimize the potential for rapid drainage through permanent systems and are consistent with the assumptions used in the analysis presented in NUREG-1738.

IDC #8: An onsite restoration plan will be in place to provide repair of the SFP cooling systems or to provide access for makeup water to the SFP. The plan will provide for remote alignment of the makeup source to the SFP without requiring entry to the refuel floor.

In Table 4 of Attachment 1 of the application dated December 16, 2016, the licensee described procedures in place to restore the SFP cooling systems, provide normal makeup to the SFP, and provide an alternate path for makeup water to the SFPs without requiring entry to the refueling floor. The NRC staff finds that the planned SFP cooling and make-up water capability conformed to the capabilities assumed for the staff analysis presented in NUREG-1738.

IDC #9: Procedures will be in place to control SFP operations that have the potential to rapidly decrease SFP inventory. These administrative controls may require additional operations or management review, management physical presence for designated operations or administrative limitations such as restrictions on heavy load movements.

In Table 4 of Attachment 1 of the application dated December 16, 2016, the licensee described that procedures govern SFP operations, such as water transfer or ISFSI activities that could have the potential to rapidly decrease SFP inventory. The licensee stated that administrative requirements maintain SFP inventory within a specified band. No ISFSI operations have the potential to cause a rapid loss of coolant inventory. Procedures control water inventory during ISFSI operations and ensure the single-failure-proof attributes of the heavy load handling system are maintained. The NRC staff finds that the described procedures conformed to the administrative controls considered in the staff analysis presented in NUREG-1738.

IDC #10: Routine testing of the alternative fuel pool makeup system components will be performed and administrative controls for equipment out of service will be implemented to provide added assurance that the components would be available, if needed.

In Table 4 of Attachment 1 of the application dated December 16, 2017, the licensee described several alternate makeup sources including the FCS fire pumps that can supply makeup water to the SFP via the fire water system. The licensee stated that the fire protection system is routinely tested to ensure its capability is maintained. In addition, the licensee stated that procedures contain the licensee's maintenance and testing requirements for equipment designated for strategies to maintain or restore spent

fuel cooling. The NRC staff finds that the described administrative controls conform to those considered in the staff analysis presented in NUREG-1738.

SDA #1: Licensee's SFP cooling design will be at least as capable as that assumed in the risk assessment, including instrumentation. Licensees will have at least one motor-driven and one diesel-driven fire pump capable of delivering inventory to the SFP.

Section 9.6, "Auxiliary Systems - Spent Fuel Pool Cooling System," of the FCS USAR describes the fuel pool cooling system, which is a Seismic Class I system configured with two pumps in parallel. The SFP makeup system can provide up to 500 gpm from the safety injection and refueling water tank. In addition, the licensee described that electric motor-driven and diesel engine-driven fire water pumps would be maintained to provide additional makeup water capability. Instrumentation was described in the discussion of IDC #5. The NRC staff finds the described cooling and makeup capabilities are comparable to the capabilities considered in the staff analysis presented in NUREG-1738.

SDA #2: Walk-downs of SFP systems will be performed at least once per shift by the operators. Procedures will be developed for and employed by the operators to provide guidance on the capability and availability of onsite and offsite inventory makeup sources and time available to initiate these sources for various loss of cooling or inventory events.

In Table 4 of Attachment 1 of the application dated December 16, 2017, the licensee stated that operations personnel perform a walk-down of SFP systems once per shift. Procedures provide the necessary guidance to address loss of SFP cooling and loss-of-level conditions. The NRC staff finds that the proposed monitoring of the SFP systems would be comparable to the capability assumed for the staff analysis presented in NUREG-1738.

SDA #3: Control room instrumentation that monitors SFP temperature and water level will directly measure the parameters involved. Level instrumentation will provide alarms at levels associated with calling in offsite resources and with declaring a general emergency.

In Table 4 of Attachment 1 of the application dated December 16, 2016, the licensee described that control room SFP temperature instrumentation includes indication of the SFP heat exchanger outlet temperature, and alarms indicating high SFP heat exchanger outlet temperature and no operating SFP cooling pump. These indications and alarms do not provide direct indication of SFP temperature, but the alarm for no operating SFP pump provides indication that the temperature indication is disassociated from the SFP temperature. The SFP temperature indication displayed on the emergency response facility computer provides direct indication of pool temperature at three elevations, and the SFP level instrument provides direct local indication of SFP level and alarms for low and high SFP level in the main control room. The licensee stated that the alarm setpoints for the instruments used for emergency classifications would be changed to reflect the emergency plan limits. The NRC staff finds that the SFP monitoring capability is consistent with the assumptions in the analysis presented in NUREG-1738.

SDA #4: Licensee determines that there are no drain paths in the SFP that could lower the pool level (by draining, suction, or pumping) more than 15 feet below the normal pool operating level and that licensee must initiate recovery using offsite sources.

In Table 4 of Attachment 1 of the application dated December 16, 2016, the licensee described potential drain or siphon paths within the SFP. Neither of the normal SFP cooling suction and discharge paths within the SFP could lower pool level more than 15 feet below the normal operating level. However, the controlled and locked closed lower suction line penetrates the SFP liner more than 15 feet below the normal SFP operating level. The normally open upper suction line protects against siphoning, and the seismic design classification of the SFP cooling system and the controlled locked closed position of the lower suction line protect against drainage via that path. Therefore, the NRC staff finds that the SFP design reasonably protects against drainage consistent with the assumptions used in the analysis presented in NUREG-1738.

SDA #5: Load Drop consequence analysis will be performed for facilities with nonsingle failure-proof systems. The analyses and any mitigative actions necessary to preclude catastrophic damage to the SFP that would lead to a rapid pool draining would be sufficient to demonstrate that there is high enough confidence in the facility's ability to withstand a heavy load drop.

As discussed under IDC #1, the licensee committed to use single-failure proof cranes for such loads. Therefore, the NRC staff finds that the protection against heavy load drops is consistent with the assumptions considered in the analysis presented in NUREG-1738.

SDA #6: Each decommissioning plant will successfully complete the seismic checklist provided in Appendix 2B to this study [NUREG-1738]. If the checklist cannot be successfully completed, the decommissioning plant will perform a plant specific seismic risk assessment of the SFP and demonstrate that SFP seismically induced structural failure and rapid loss of inventory is less than the generic bounding estimates provided in this study [NUREG-1738] ($<1 \times 10^{-5}$ per year including non-seismic events).

The licensee completed a seismic evaluation in response to an NRC request for information pursuant to the requirements of 10 CFR 50.54(f) regarding Recommendation 2.1 of the NRC's Near-Term Task Force Review of insights from the Fukushima Dai-ichi Accident. The seismic evaluation was performed consistent with NRC guidance and determined that the SFP value for high confidence of low probability of failure for the once per 100,000 year hazard level satisfies the pool performance guideline specified in NUREG-1738. As discussed previously, the NRC review of this evaluation is available in Reference 39. Therefore, the plant-specific seismic risk assessment results are acceptable for FCS.

SDA #7: Licensees will maintain a program to provide surveillance and monitoring of Boraflex in high-density spent fuel racks until such time as spent fuel is no longer stored in these high-density racks.

The FCS SFP storage racks contain Boral rather than Boraflex panels for nuclear criticality control. As described in Section 9.5 of the FCS USAR, Boral neutron absorption panels are used in both regions of the spent fuel storage racks, and the panels are protected by a stainless steel sheath. The FCS Technical Specifications include surveillance requirements to periodically evaluate Boral sample coupons to ensure the required performance of the Boral material for the life of the racks. The NRC finds that the criticality prevention methods at FCS satisfy the assumption regarding the integrity of solid neutron-absorbing panels assumed in the analysis presented in NUREG-1738.

Based on the above evaluations, the NRC staff concludes that the design and operation of structures, systems, and components associated with SFP storage provide for safe storage of spent fuel and are consistent with the capabilities assumed in the analysis presented in NUREG-1738.

6. Verification that the licensee presents a determination that there are sufficient resources and adequately trained personnel available on-shift to promptly 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

The FCS mitigative strategies are maintained in accordance with License Condition 3.G(b)7 of the FCS Renewed Facility Operating License. Mitigating strategies specific to the implementation of NEI 06-12, Table A.2-2, "SFP Makeup - External Strategy," can be performed by the proposed on-shift crew within 2 hours without impacting the performance of designated emergency plan functions. The ability to perform the required actions within the specified time is documented and retained at the station for review utilizing the FCS Operator Response Time Program. The systematic approach to training is implemented to ensure Operations and other appropriate personnel receive initial and continuing training on B.5.b event-related procedures and strategies credited in the Mitigation Strategy License Condition.

7. Verification that mitigation strategies are consistent with that required by the permanently defueled technical specifications or by retained license conditions.

Section 9.6 of the FCS USAR describes the SFP cooling system, which is a Seismic Class I system configured with two pumps in parallel. The SFP makeup system can provide up to 500 gpm from the safety injection and refueling water tank. In addition, the licensee described that electric motor-driven and diesel engine-driven fire water pumps would be maintained to provide additional makeup water capability.

The FCS provides that one of the primary makeup strategies is from the fire protection system. The fire protection system has redundant pumping capability and power supplies to ensure alternate SFP makeup functions. The system is supplied by redundant pumps, one diesel-driven and one electric motor-driven, each design rated for 2,000 gpm at 125 pounds per square inch gauge (psig) discharge pressure. Both pumps take suction from the plant intake cooling water structure from the Missouri River. The fire protection header is normally maintained at greater than 130 psig by a jockey

pump. If pressure decreases in the system, the fire pumps are automatically started by their initiation logic to maintain the fire protection system header pressure. The electric motor-driven pump starts when system pressure decreases to 110 psig, and the diesel-driven pump is started in 10 seconds if the electric motor-driven pump does not start or when system pressure drops to 100 psig. The fire protection system can also be cross-connected with the Blair Water System (city water). The fire protection system provides defense-in-depth, and is routinely tested to ensure capability is maintained. Additionally, there is an onsite diesel fire truck that can also take suction from the Missouri River, or a hydrant, to provide an alternate source of makeup water to the SFP. It is a pumper-type fire truck, which is able to provide 200 to 500 gpm of makeup water to the SFP.

4.0 EXEMPTIONS

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security, and (2) when special circumstances are present.

Special circumstances exist when application of the regulation in the particular circumstance would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule (10 CFR 50.12(a)(2)(ii)). The underlying purpose of Section 50.54(q) is to ensure that licensees follow and maintain in effect emergency plans that provide reasonable assurance that adequate protective measures can and will be taken in the event of an emergency at a nuclear reactor. Sections 50.47(b) and (c) outline the planning standards and size of EPZs, respectively, that are to be considered in emergency plans, and Appendix E to 10 CFR Part 50 identifies the information that must be included in emergency plans.

This section of the safety evaluation reflects the NRC staff's technical evaluation of the licensee's exemption requests, as provided to the Commission in SECY-17-0080, which was approved by the Commission in the SRM to SECY-17-0080.

4.1 Specific Exemptions for 10 CFR 50.47

The licensee's letter dated December 16, 2016, requested an exemption from certain sections (as indicated by text in ~~strikeout~~ and **boldface font**) of 10 CFR 50.47 for FCS.

4.1.1 10 CFR 50.47(b)

The onsite ~~and, except as provided in paragraph (d) of this section, offsite~~ emergency response plans for nuclear power reactors must meet the following standards:

The NRC requires a level of licensee emergency preparedness commensurate with the potential consequences to public health and safety, and common defense and security at the licensee's site. The licensee's exemption request included radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of remaining applicable design-basis accidents would not exceed the limits of the EPA early phase PAGs at the EAB. The licensee also concluded and the staff confirmed, as of 530 days (1 year, 165 days) after the final reactor shutdown, in the unlikely event of a loss of SFP integrity, due to

a beyond-design-basis event, resulting in all cooling is lost to the spent fuel and a heat-up under adiabatic conditions resulted, at least 10 hours would be available before the hottest fuel assembly reached 900 °C to take mitigative actions.

The NUREG-1738, and enhancements put into place as a result of the events of September 11, 2001, and Fukushima Dai-ichi Accident, support staff assumptions that: only a highly unlikely, beyond-design-basis event (e.g., extreme earthquake or large aircraft impact) could result in an SFP fire. In addition, there would be a significant amount of time between the initiating event and the possible onset of conditions that could result in an SFP zirconium cladding fire. This time provides a substantial opportunity for event mitigation. Licensees are required to maintain effective strategies, sufficient resources and adequately trained personnel to mitigate such an event. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for OROs to implement these measures using a CEMP, "all-hazards," approach.

Considering the very low probability of beyond-design-basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not necessary for a permanently shut down and defueled nuclear power reactor.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR 50.47(b) above is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.2 10 CFR 50.47(b)(1)

Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations ~~within the Emergency Planning Zones~~ 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.

In NUREG-0396 (Reference 32), the NRC provided that emergency response plans should be useful for responding to any accident that would produce offsite radiological doses in excess of the EPA PAGs. Additionally, NUREG-0396 introduced the concept of generic plume exposure pathway zones as a basis for the planning of response actions, which would result in dose savings in the environs of nuclear facilities in the event of a serious power reactor accident. In addition, reactor core melt (Class 9) scenarios, which were also considered in NUREG-0396, are no longer applicable to a permanently shut down and defueled power reactor.

In the Statement of Consideration (SOC) for the Final Rule for EP requirements for ISFSIs and for monitored retrievable storage (MRS) facilities (60 FR 32430; June 22, 1995), the Commission responded to comments concerning an EPZ for an ISFSI and MRS, and concluded that, "...based on the potential inventory of radioactive material, potential driving forces for distributing that amount of radioactive material, and the probability of the initiation of these events, the Commission concludes that the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones."

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, designated plume exposure and ingestion pathway EPZs are no longer needed.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(1), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.3 10 CFR 50.47(b)(3)

Arrangements for requesting and effectively using assistance resources have been made, ~~arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made~~, and other organizations capable of augmenting the planned response have been identified.

With the termination of reactor power operations at FCS and the permanent removal of the fuel from the reactor vessel to the SFP, most of the accident scenarios postulated for operating reactors are no longer possible. The spent fuel is now stored in the SFP and the ISFSI, and will remain onsite until it can be moved offsite for long-term storage or disposal. The reactor, reactor coolant system and secondary system are no longer in operation and have no function related to the storage of the spent fuel. Therefore, postulated accidents involving failure or malfunction of the reactor, reactor coolant system, or supporting systems are no longer applicable. During reactor decommissioning, the principal public safety concerns involve the radiological risks associated with the storage of spent fuel onsite.

The emergency operations facility (EOF) is a support facility for the purpose of managing the overall licensee emergency response (including coordination with Federal, State, and local officials), coordination of radiological and environmental assessments, and determination of recommended public protective actions. The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, an EOF would not be needed to coordinate these types of assessments for determining public protective actions. Onsite operations staff will continue to maintain and provide for communication and coordination capabilities with offsite authorities and OROs for the purpose of notification and for the level of support required for remaining design-basis accidents and the prompt implementation of mitigative actions in response to a SFP accident.

Based on the above analysis and the analysis provided in Section 4.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(3),

above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.4 10 CFR 50.47(b)(4)

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, ~~and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for minimum initial offsite response measures is not required.

Based on the above analysis and the analysis provided in Section 4.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(4), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.5 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 followup messages to response organizations ~~and the public~~ has 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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, a means to provide early notification and clear instruction to the populace within a designated plume exposure pathway EPZ is no longer required.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(5), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.6 10 CFR 50.47(b)(6)

Provisions exist for prompt communications among principal response organizations to emergency personnel ~~and to the public.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to provide prompt communication to the public within a designated plume exposure pathway EPZ in regards to initial or pre-determined protective actions is no longer needed.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(6), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.7 10 CFR 50.47(b)(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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to provide periodic information to the public within a designated plume exposure pathway EPZ on how they will be notified, what their initial or predetermined protective actions should be in an emergency and the physical location or locations for dissemination of information is not needed.

Based on the above analysis and the analysis provided in Sections 4.1.1 and 4.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(7), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.8 10 CFR 50.47(b)(9)

Adequate methods, systems, and equipment for assessing and monitoring actual or potential ~~offsite~~ consequences of a radiological emergency condition are in use.

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for assessing or monitoring offsite consequences beyond the EAB is not needed.

Based on the above analysis and the analysis provided in Section 4.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(9), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.9 10 CFR 50.47(b)(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.~~

The Commission provided its view on evacuation planning for an ISFSI (not at an operating reactor site) in its SOC for the Final Rule for EP requirements for an ISFSI and an MRS (60 FR 32430; June 22, 1995) stating: "The Commission does not agree that as a general matter emergency plans for an ISFSI must include evacuation planning."

The NRC staff has determined that no credible events within the design basis would result in doses to the public that would exceed the EPA early phase PAGs at the EAB. Therefore, EPZs beyond the EAB and the associated protective actions developed from evacuation time estimates (ETEs) are no longer required. Additionally, in the unlikely event of an SFP accident, the iodine isotopes, which contribute to an offsite dose from an operating reactor power accident, are not present, so KI distribution would no longer serve as an effective or necessary supplemental protective action. As such, the staff concludes that OPPD provides for an acceptable level of emergency planning at FCS in its permanently shutdown and defueled condition, and also provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at FCS.

Although formal offsite REP plans (in accordance with 44 CFR Part 350) have typically been exempted for decommissioning sites, OROs will continue to be relied upon for firefighting, law enforcement, ambulance and medical services in support of the licensee's (onsite) emergency plan. The licensee is responsible for providing protective measures for any emergency workers responding onsite. Additionally, the licensee is responsible for control of activities within the EAB, including public access. The licensee actions that are necessary to protect the health and safety of members of the public who are in the EAB may include, but are not limited to, evacuation, sheltering and decontamination in the unlikely event of a release of radioactive materials.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(10), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.1.10 10 CFR 50.47(c)(2)

~~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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for an EPZ is not required.

Section 50.47(c)(2) and footnote 1 to Appendix E to 10 CFR Part 50 both state, in part: "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 [megawatt] thermal." This is not applicable to FCS and, therefore, requires no exemption.

Based on the above analysis and the analysis provided in Section 4.1.9 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(c)(2), above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provision of 10 CFR 50.12(a)(2)(ii).

4.2 Specific Exemptions for 10 CFR Part 50, Appendix E, Section IV

OPPD's letter dated December 16, 2016, requested an exemption from certain sections (as indicated by strikeout and bolded text) of Appendix E to 10 CFR Part 50 for FCS.

4.2.1 10 CFR Part 50, Appendix E, Section IV.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, recovery, ~~and onsite protective actions during hostile action~~. 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.

After the terrorist attacks of September 11, 2001, the NRC evaluated the EP planning basis to ensure it continued to protect the public health and safety in the current threat environment. In 2002, the NRC issued Orders requiring compensatory measures, which include nuclear security and EP. The NRC staff determined that the EP planning basis continues to protect public health and safety; however, the NRC staff recognized that enhancements were desirable to ensure effective plan implementation during security-related events at nuclear power reactors (e.g., more timely NRC notification; additional onsite protective action considerations, and revision of emergency action levels to identify security-related emergencies more succinctly).

The NRC issued NRC Bulletin (BL) 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," dated July 18, 2005 (Reference 41), to obtain information from licensees on progress in implementing security-event-related EP program enhancements. The 2011 EP Final Rule, "Enhancements to Emergency Preparedness Regulations" (76 FR 72560; November 23, 2011), made generically applicable the security-based response elements of NRC BL 2005-02. The enhancements of NRC BL 2005-02 were not applicable to holders of operating licenses for power reactors that had permanently ceased operations and had certified that fuel had been removed from the reactor vessel. The licensee has certified that it has permanently ceased operations at FCS and that all fuel has been removed from the reactor vessel. Therefore, the enhancements for hostile actions, as required by the 2011 EP Final Rule, are not necessary for FCS in its permanently shutdown and defueled status.

Additionally, the NRC excluded non-power reactors from the definition of "hostile action" at the time of the 2011 EP Final Rule 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. Like a non-power reactor, a decommissioning nuclear reactor also has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating nuclear reactor. For all of the above reasons, the NRC staff concludes that a decommissioning nuclear power reactor is not a facility that falls within the definition of "hostile action."

Although this analysis provides a justification for exempting FCS from "hostile action" related requirements, some EP requirements for security-based events are maintained. The classification of security-based events, notification of offsite authorities, and coordination with offsite agencies are still required.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.1, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.2 10 CFR Part 50, Appendix E, Section IV.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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirements for an EPZ and ETEs are not required.

Based on the above analysis and the analyses provided in Section 4.1.9 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.2, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.3 10 CFR Part 50, Appendix E, Section IV.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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.

Based on the above analysis and the analyses provided in Sections 4.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.3, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.4 10 CFR Part 50, Appendix E, Section IV.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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.

Based on the above analysis and the analysis provided in Sections 4.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.4, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.5 10 CFR Part 50, Appendix E, Section IV.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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset

of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.

Based on the above analysis and the analysis provided in Sections 4.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.5, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.6 10 CFR Part 50, Appendix E, Section IV.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 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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.

Based on the above analysis and the analysis provided in Sections 4.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.6, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.7 10 CFR Part 50, Appendix E, Section IV.A.1

A description of the normal plant ~~operating~~ organization.

Upon docketing of the certifications of permanent ceasing of operations and permanent removal of fuel from the reactor vessel, the 10 CFR Part 50 license for FCS was amended and no longer authorizes operation of the FCS reactor, or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Because the licensee is no longer authorized to

operate the reactor, the licensee does not have a plant "operating" organization. A description of the plant organization, as it relates to the requirements in Section IV.A.1 to Appendix E of 10 CFR Part 50 is still required.

Based on the above analysis, the NRC staff concludes that the exempted language from Section IV.A.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.8 10 CFR Part 50, Appendix E, Section IV.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.~~

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. OPPD furnished information concerning its SFP inventory makeup strategies that could be used in the event of a catastrophic loss of SFP water inventory and stated that designated on-shift personnel are trained to implement such strategies with equipment maintained onsite. OPPD has site personnel designated to respond within two hours of the Alert classification to assist the on-shift staff. As such, designation of specific licensee headquarters personnel is not necessary for the augmentation of the on-shift staffing and, therefore, is not described.

Based on the above analysis and the analysis provided in Section 4.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.A.3 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.9 10 CFR Part 50, Appendix E, Section IV.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.

The licensee's analysis demonstrated that, as of 10 days after the final reactor shutdown, no design-basis accidents result in doses in excess of the EPA early phase PAGs to the public beyond the EAB. While it is unlikely that a beyond-design-basis event would result in doses in excess of the EPA early phase PAGs to the public beyond the EAB, the licensee still must be able to determine if a radiological release is occurring, thereby achieving the underlying purpose of the rule. If a release is occurring, then the licensee's staff are still required to communicate that information to offsite authorities for their consideration. The offsite authorities are responsible for deciding what, if any, protective actions should be taken that they consider appropriate to protect public health and safety.

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable

design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for offsite dose projections is not required.

Based on above analysis and the analysis provided in Section 4.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.A.4 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.10 10 CFR Part 50, Appendix E, Section IV.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.~~

The number of licensee staff at decommissioning sites is generally smaller than that for an operating power reactor, but is still commensurate with the need to operate the facility in a manner that is protective of public health and safety. The NRC staff considered the similarity between the staffing levels at a permanently shut down and defueled reactor, and staffing levels at an operating power reactor site, since the spectrum of accidents at a decommissioning facility is greatly reduced requiring less specialized qualifications. The limited number of systems and equipment needed to maintain the spent fuel in a safe condition in the SFP or in an ISFSI requires only minimal personnel, which is governed by the FCS Technical Specifications.

The licensee furnished information concerning its SFP inventory makeup strategies that could be used in the event of a catastrophic loss of SFP water inventory and stated that designated on-shift personnel are trained to implement such strategies with equipment maintained onsite. The licensee has site personnel designated to respond within 2 hours of the Alert classification to assist the on-shift staff. As such, additional employees or other persons with special qualifications are not anticipated.

Considering the very low-probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for personnel with special qualifications, as directed in 10 CFR Part 50, Appendix E, Section IV.A.5, is not required.

Based on above analysis and the analyses provided in Sections 4.1.1 and 4.2.8 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.A.5 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this

requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.11 10 CFR Part 50, Appendix E, Section IV.A.7

~~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.

In the 2011 EP Final Rule, the Commission defined "hostile action" as, in part, "an act directed toward a nuclear power plant or its personnel." The 2011 EP Final Rule made generically applicable, the security-based response elements of NRC BL 2005-02. The enhancements from NRC BL 2005-02 were applicable to all holders of operating licenses for nuclear power reactors, except those who have permanently ceased operation and have certified that fuel has been removed from the reactor vessel.

With the certifications of 10 CFR 50.82(a)(1)(ii), the 10 CFR Part 50 license for FCS no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Therefore, the enhancements for hostile actions required by the 2011 EP Final Rule are not applicable for FCS in its permanently shutdown and defueled status.

Although the "hostile action" enhancements in the 2011 EP Final Rule are not applicable to a decommissioning reactor, 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, such as the classification of security-based events, notification of offsite authorities, and coordination for the response of OROs (i.e., law enforcement, firefighting, medical assistance) onsite.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.2.1 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.A.7 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.12 10 CFR Part 50, Appendix E, Section IV.A.8

~~Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public

beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, identification of the State and/or local officials responsible for detailed pre-planning for, ordering and controlling appropriate offsite protective actions, including evacuations when necessary, is no longer required as part of the FCS emergency plan. If deemed warranted by governmental officials, offsite protective actions would be implemented under a CEMP, or all-hazards, process.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.A.8 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.13 10 CFR Part 50, Appendix E, Section IV.A.9

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

The number of staff required at decommissioning sites is significantly reduced commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. The duties of the on-shift personnel at a decommissioning reactor facility are not as complicated and diverse as those for an operating power reactor. The systems and equipment needed to maintain the spent fuel in a safe condition in an SFP or in an ISFSI requires minimal personnel and are governed under the FCS Technical Specifications. In the 2011 EP Final Rule, the NRC required nuclear power plant licensees to provide a detailed analysis to show that on-shift personnel assigned emergency plan implementation functions were not assigned any responsibilities that would prevent them from performing their assigned emergency plan functions. As part of the 2011 EP Final Rule, 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. Therefore, based on similarities of non-power reactors and decommissioning reactors with regard to staffing, and as discussed in Section 4.2.1, a detailed staffing analysis is not needed for a decommissioning reactor.

Based on the above analysis, the NRC staff concludes that the exempted language from Section IV.A.9 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of the rule as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.14 10 CFR Part 50, Appendix E, Section IV.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 ~~and outside~~ the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite ~~and offsite~~ monitoring. ~~By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.~~ The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.

Since a radiological release from any remaining applicable design-basis accident is not estimated to exceed EPA early phase PAGs beyond the EAB, event classification above the Alert level is no longer required, which is consistent with exemptions for previous decommissioning power reactors. The licensee will still be required to maintain EALs for the classification of security-based events to the Alert level, which was requested by OPPD in a letter dated December 16, 2016 (Reference 42). In the EP Final Rule, the Commission defined "hostile action" as, in part, "an act directed toward a nuclear power plant or its personnel." The 2011 EP Final Rule made generically applicable the security-based response elements of NRC BL 2005-02, which provided numerous enhancements to licensee emergency plans including security-based EALs. The NRC staff is maintaining the requirement for security-based EALs similar to power reactors as they were required by NRC Order EA-02-026, "Fort Calhoun Station, Unit 1 - Issuance of Order for Interim Safeguards and Compensatory Security Measures," dated February 25, 2002 (Reference 43). Exemption from hostile action enhancements for decommissioning reactors was also previously discussed in Section 4.2.1 of this safety evaluation.

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, a decommissioning reactor is not required to have EALs to determine protective measures offsite. With respect to EALs for hostile action, refer to basis for 10 CFR Part 50, Appendix E, Section IV.1.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.2.1 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.B.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.15 10 CFR Part 50, Appendix E, Section IV.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 ~~and offsite~~ radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, ~~such as the pressure in containment and the response of the Emergency Core Cooling System~~) 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, ~~(3) site area emergency, and (4) general emergency~~. These classes are further discussed in NUREG-0654/FEMA-REP-1.

Containment and emergency core cooling system parameters no longer provide an indication of a potential emergency for a permanently shut down and defueled power reactor, and emergency core cooling systems are no longer required. Other available indications, such as SFP level, SFP temperature, and area radiation monitors, will remain at FCS and will continue to provide indicate the conditions of spent fuel stored in the SFP.

In the SOC 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, "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. As previously discussed, NRC studies have concluded that the maximum offsite dose would be less than 1 rem which is within the EPA Protective Action Guides." It further provides a response to comments concerning an EPZ for an ISFSI and MRS: "[B]ased on the potential inventory of radioactive material, potential driving forces for distributing that amount of radioactive material, and the probability of the initiation of these events, the Commission concludes that the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones."

The licensee's analysis demonstrates that no remaining applicable design-basis accident would reach the dose criteria for the declaration of a Site Area Emergency or a General Emergency. As discussed previously in Section 4.2.14, the probability of a beyond-design-basis accident condition that could reach emergency classifications of a Site Area Emergency or a General Emergency is very low. In the unlikely event of a beyond-design-basis event resulting in the loss of all cooling to spent fuel stored in the SFP, as of 530 days (1 year, 165 days) after the final reactor shutdown, it would take 10 hours from the time the fuel is uncovered until it reaches a temperature of 900 °C. During this time, the licensee is required to maintain the capability to initiate prompt mitigative actions consistent with plant conditions. Considering the very low probability of beyond-design-basis events occurring that would affect SFP structural integrity, as well as the time available to initiate SFP mitigative measures before the onset of a postulated zirconium cladding fire, the need for an event classification level above an Alert is no longer required.

Based on the above analysis and the analysis provided in Section 4.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.C.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.16 10 CFR Part 50, Appendix E, Section IV.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.

In the 2011 EP Final Rule (76 FR 72560; November 23, 2011), nuclear power reactor licensees were required to assess, classify and declare an emergency condition within 15 minutes. Non-power reactors do not have the same potential impact on public health and safety as do power reactors, and as such, non-power reactor licensees do not require complex offsite emergency response activities and are not required to assess, classify and declare an emergency condition within 15 minutes. Similarly, a decommissioning power reactor has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating power reactor. Unlike operating reactor accident sequences potentially leading to large early releases, accident scenarios at decommissioning plants' SFPs evolve much more slowly than a power reactor and provide a longer time period to initiate SFP mitigative actions or, if warranted by governmental officials, appropriate offsite protective actions for the public. Because a decommissioning power reactor, like a non-power reactor, does not have the same potential radiological impact on public health and safety as a power reactor, the NRC staff concludes that a decommissioning power reactor should not be required to assess, classify and declare an emergency condition within 15 minutes. The licensee proposes in its exemption requests to assess, classify, and declare an emergency condition within 30 minutes. The States of Nebraska and Iowa have agreed that this emergency declaration time is appropriate.

Based on the above analysis, the NRC staff concludes that the exempted language from Section IV.C.2 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.17 10 CFR Part 50, Appendix E, Section IV.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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable

design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for prompt notification of the public and an EPZ are not needed.

Based on the above analysis and the analyses provided in Sections 4.1.1, 4.1.2, and 4.1.5 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.D.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.18 10 CFR Part 50, Appendix E, Section IV.D.2

~~Provisions shall be described for yearly dissemination to the public within the plume 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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for dissemination of emergency planning information to the public and an EPZ are not needed.

Based on the above analysis and the analyses provided in Sections 4.1.1, 4.1.2, and 4.1.5 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.D.2 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.19 10 CFR Part 50, Appendix E, Section IV.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 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.~~

In the permanently shutdown and defueled condition of the reactor, the rapidly developing scenarios associated with events initiated during reactor power operation are no longer credible. The slow progression of SFP events allows greater time for the licensee to successfully mitigate the accidents and, if necessary, for offsite authorities to implement appropriate protective measures using a CEMP, "all-hazards," approach protect the health and safety of the public.

The licensee proposes in its exemption requests to complete emergency notifications within 60 minutes after an emergency declaration or a change in emergency classification level. Although FCS is a general licensed ISFSI and the FCS Emergency Plan is based on 10 CFR Part 50, the NRC staff considered the requirements in 10 CFR 72.32(a) to ensure consistency between general and specific-licensed ISFSIs. The 60-minute notification timeliness is consistent with the notification time requirements for emergency plans based on the requirements in 10 CFR 72.32. Information will be disseminated to the public and media in accordance with State and local plans.

In the SOC 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 notification time of 15 minutes, and concluded that, "[t]he Commission has established a reasonable time limit for notification which has proven to be adequate in the past. 'The licensee shall also commit to notify the NRC operations center immediately after notifications of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency.'"

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, decommissioning reactors are not required to notify State and governmental agencies within 15 minutes. Additionally, the requirement for prompt notification of the public and an EPZ is not needed.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.D.3 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.20 10 CFR Part 50, Appendix E, Section IV.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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for prompt notification of the public and an EPZ, including backup alert and notification capabilities, are not needed.

Based on the above analysis and the analysis provided in Section 4.2.19 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.D.4 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.21 10 CFR Part 50, Appendix E, Section IV.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;

The guidance in NUREG-0696, "Functional Criteria for Emergency Response Facilities," February 1981 (Reference 44), provides that the technical support center (TSC) is an onsite facility located close to the control room that shall provide plant management and technical support to the reactor operating personnel located in the control room during emergency conditions. As there are no remaining applicable design-basis accidents or beyond-design-basis accidents that would exceed the EPA early phase PAGs at the EAB, and the available time to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated zirconium cladding fire, a TSC and EOF are no longer required to meet its original purpose during an emergency, nor to support initial SFP mitigation actions if needed. Coordination with offsite authorities and response organizations can be coordinated from the control room or another onsite location.

In addition, onsite actions may be directed from the control room or other onsite location, without the requirements imposed on a TSC. Due to the reduced size of on-shift and emergency response organization (ERO) staff for a permanently shut down and defueled power reactor, separate facilities to accommodate emergency response staff are no longer required. As such, greater efficiency and coordination is gained by locating staff in a central onsite facility.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.1.3, the NRC staff concludes that the exempted language from Section IV.E.8.a(i) to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.22 10 CFR Part 50, Appendix E, Section IV.E.8.a.(ii)

~~For nuclear power reactor licensees, a licensee onsite operational support center;~~

The operational 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. The OSC should provide a location where plant logistic support can be coordinated during an emergency and restrict control room access to those support personnel specifically requested by the shift supervisor. The licensee provides that the control room is where plant systems and equipment parameters are monitored. The control room is the onsite center for emergency command and control. Control room personnel assess plant conditions, evaluate the magnitude and potential consequences of abnormal conditions, initiate preventative, mitigating and corrective actions and perform notifications.

With the permanently shutdown and defueled status of the FCS reactor and the storage of the spent fuel in the SFP and the ISFSI, an OSC is no longer required to meet its original purpose during an emergency, nor to support initial SFP mitigation actions if needed. When activated, the ERO reports to the Emergency Director to assist the on-shift staff in the assessment,

mitigation and response to an emergency and to support the dispatch of emergency teams. An onsite facility will continue to be maintained, from which effective direction can be given and effective control may be exercised during an emergency.

Based on the above analysis and the analysis provided in Section 4.2.21 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.E.8.a(ii) to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.23 10 CFR Part 50, Appendix E, Section IV.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:~~

- ~~(1) Space for members of an NRC site team and Federal, State, and local responders;~~
- ~~(2) Additional space for conducting briefings with emergency response personnel;~~
- ~~(3) Communication with other licensee and offsite emergency response facilities;~~
- ~~(4) Access to plant data and radiological information; and~~
- ~~(5) Access to copying equipment and office supplies;~~

Based on the analyses provided in Sections 4.1.1 and 4.1.3 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.E.8.b to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.24 10 CFR Part 50, Appendix E, Section IV.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:~~

- ~~(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;~~
- ~~(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~~
- ~~(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~~

Based on the analyses provided in Sections 4.1.1 and 4.1.3 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.E.8.c to Appendix E of 10 CFR Part 50 is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.25 10 CFR Part 50, Appendix E, Section IV.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 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.~~

Based on the analyses provided in Sections 4.1.1, 4.2.1, and 4.2.11 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.E.8.d to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.26 10 CFR Part 50, Appendix E, Section IV.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;~~

Based on the analyses provided in Sections 4.1.3 and 4.2.21 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.E.8.e to Appendix E of 10 CFR Part 50, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.27 10 CFR Part 50, Appendix E, Section IV.E.9.a

~~Provision for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested monthly.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, provisions for communications with contiguous State/local governments within the plume exposure pathway EPZ is not needed. The licensee proposes in its exemption requests to complete emergency notifications within 60 minutes after an emergency declaration or a change in emergency classification level. Communications systems will be maintained and tested monthly. FCS will maintain communications with the States of Nebraska and Iowa, and the NRC. The States of Nebraska and Iowa will provide notifications of an emergency declaration to Washington County (Nebraska) and Harrison County (Iowa). FCS will use the commercial telephone network as the primary means to notify State agencies with wireless communications as a backup mean of communications. These systems are used on a frequent basis with exceeds the monthly testing requirements.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.E.9 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.28 10 CFR Part 50, Appendix E, Section IV.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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, as discussed in Sections 4.2.21 and 4.2.22 of this safety evaluation, there is no need for a TSC, EOF, or offsite field assessment teams to meet the underlying purpose of the rule. With the elimination of the requirements for a TSC, EOF, and the field assessment teams, the requirements to perform annual testing is no longer required. Communications with State and local governments will continue to be tested monthly under 10 CFR Part 50, Appendix E, Section IV.E.9.a.

Based on the above analysis and the analyses provided in Sections 4.2.21 and 4.2.22 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.9.c, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.29 10 CFR Part 50, Appendix E, Section IV.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 near-site emergency operations** facility. Such communications shall be tested monthly.

As discussed in Sections 4.2.21 and 4.2.22 of this safety evaluation, the need for a separate TSC and EOF no longer exists given the smaller facility staffing and the greatly reduced required interaction with State and local emergency response facilities. Therefore, the NRC staff concludes that the functions of the control room, EOF, TSC, and the OSC may be combined into one or more locations. As a result, communications between the EOF and TSC, and the NRC, and monthly testing of these capabilities are no longer needed. Communications with NRC Headquarters and the appropriate NRC Regional Office Operations Center will continue to be tested monthly.

Based on the above analysis and the analyses provided in Sections 4.2.21, and 4.2.22 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.E.9.d to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.30 10 CFR Part 50, Appendix E, Section IV.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:

- i. Directors and/or coordinators of the plant emergency organization;
- ii. Personnel responsible for accident assessment, including control room shift personnel;
- iii. Radiological monitoring teams;
- iv. Fire control teams (fire brigades);
- v. Repair and damage control teams;
- vi. First aid and rescue teams;
- vii. Medical support personnel;
- viii. ~~Licensee's headquarters support personnel;~~**
- ix. Security personnel.

In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/~~Civil Defense~~, local law enforcement personnel, ~~local news media persons~~.

The number of staff required at decommissioning sites is generally small, but is commensurate with the need to safely store spent fuel at the facility in a manner that ensures public health and safety. Decommissioning sites typically have a level of emergency response that does not require additional response by licensee headquarters personnel, therefore training of these personnel is not needed. Training for licensee personnel responding from company locations offsite will still be required to be trained based on ERO positions specified above.

"Civil Defense" is an outdated term and no longer used. The category of offsite responders, which could be expected to respond onsite, is captured under "local emergency services" and "local law enforcement." Local news media are not included in the category of local services personnel requiring periodic radiological orientation training. The OPPD Corporate Crisis Communication Plan provides guidance for the dissemination of information during an event at FCS. Principal points of contact with news media are also determined per the OPPD Corporate Crisis Communication Plan.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.2.8 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.1 to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.31 10 CFR Part 50, Appendix E, Section IV.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, ~~test the public alert and notification system,~~ and ensure that emergency organization personnel are familiar with their duties.

Based on the analyses provided in Sections 4.1.1 and 4.2.19 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.32 10 CFR Part 50, Appendix E, Section IV.F.2.a.

~~A full participation exercise⁴ which tests as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation shall be 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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to conduct a full participation exercise with State and local agencies is not needed. The licensee proposes in its exemption requests to continue to invite the State of Nebraska and Washington County to participate in the periodic drills and exercise conducted at FCS. The licensee would be exempt from 10 CFR Part 50, Appendix E, Section IV.F.2.a.(i)-(iii) because the licensee would be exempt from the umbrella provision of 10 CFR Part 50, Appendix E, Section IV.F.2.a.

Based on above analysis and the analysis provided in Section 4.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.2.a to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.33 10 CFR Part 50, Appendix E, Section IV.F.2.b.

Each licensee at each site shall conduct a subsequent exercise of its onsite emergency plan every 2 years. ~~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.~~ 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, assessment of the onsite ~~and offsite~~ impact of radiological releases, ~~protective action recommendation development, protective action decision making, plant~~ system-repair and mitigative action implementation. 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, and the drills may focus on the onsite exercise training objectives.

The intent of submitting exercise scenarios at an operating power reactor site in advance is to check that licensees utilize different scenarios in order to prevent the preconditioning of responders at power reactors. For decommissioning power reactor sites, there are limited events that could occur, and as such, the submittal of exercise scenarios for the purpose of ensuring that responders do not get preconditioned to certain scenarios is not necessary to achieve the underlying purpose of the rule.

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, drills involving principle functional areas associated with formal offsite REP are not needed. As discussed previously in Sections 4.2.21 and 4.2.22 of this safety evaluation, there is no need for an OSC, TSC, or EOF to meet the underlying purpose of the rule.

Based on the above analysis and the analyses provided in Sections 4.1.1, 4.2.21, 4.2.22, and 4.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.2.b to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.34 10 CFR Part 50, Appendix E, Section IV.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,⁶ then each licensee shall:~~

- ~~(1) Conduct an exercise biennially of its onsite emergency plan;~~
- ~~(2) Participate quadrennially in an offsite biennial full or partial participation exercise;~~
- ~~(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;~~
- ~~(4) Conduct a hostile action exercise of its onsite emergency plan in each exercise cycle; and~~
- ~~(5) Participate in an offsite biennial full or partial participation hostile action exercise in alternating exercise cycles.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to conduct a full participation exercise with State and local agencies is not needed.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.2.c to Appendix E of 10 CFR Part 50, above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.35 10 CFR Part 50, Appendix E, Section IV.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 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.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to ensure the State fully participate in the ingestion pathway portion of the exercise is not needed.

Additionally, the NRC excluded non-power reactors from the definition of "hostile action" at the time of the 2011 EP Final Rule 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. Like a non-power reactor, a decommissioning nuclear reactor also has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating nuclear reactor. For all of the above reasons, the NRC staff concludes that a decommissioning nuclear power reactor is not a facility that falls within the definition of "hostile action."

Based on the above analysis and the analyses provided in Sections 4.1.1, 4.2.1, and 4.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.2.d to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.36 10 CFR Part 50, Appendix E, Section IV.F.2.e.

~~Licensees shall enable any State or local Government located within the plume exposure pathway EPZ to participate in the licensee's drills when requested by such State or local Government.~~

The licensee's exemption request provided radiological analyses to show that, as of 10 days after the final reactor shutdown, the radiological consequences of the only remaining applicable design-basis accident would not exceed the limits of the EPA early phase PAGs to the public beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP integrity, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) and their associated EPZs are not needed. Therefore, identifying State and local governments in relation to a plume exposure pathway EPZ that is no longer required is not needed.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.2.e to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this

requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.37 10 CFR Part 50, Appendix E, Section IV.F.2.f.

Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, ~~in consultation with FEMA,~~ 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. ~~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.~~

As discussed in Section 4.2.32 of this safety evaluation, the requirement to conduct a full participation exercise with State and local agencies is not needed. Since full participation emergency plan exercises are not required and FEMA does not have responsibilities related to onsite emergency preparedness, NRC consultation with FEMA is not necessary.

Based on the above analysis and the analyses provided in Sections 4.1.1 and 4.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.2.f to Appendix E of 10 CFR Part 50 above is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.38 10 CFR Part 50, Appendix E, Section IV.F.2.i.

Licensees shall use drill and exercise scenarios that provide reasonable assurance that anticipatory responses will not result from preconditioning of participants. ~~Such scenarios for nuclear power reactor licensees must include a wide spectrum of radiological releases and events, including hostile action.~~ Exercise and drill scenarios as appropriate must emphasize coordination among onsite and offsite response organizations.

The NRC staff previously evaluated the issues of preconditioning drill scenarios and including hostile action scenarios at decommissioning plants in Section 4.2.32 and Section 4.2.1, respectively, of this safety evaluation. In each instance, the NRC staff concluded that the exempted words were not needed to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

Based on the above analysis and the analyses provided in Sections 4.1.1, 4.2.1, and 4.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.2.i to Appendix A of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.39 10 CFR Part 50, Appendix E, Section IV.F.2.j.

~~The exercises conducted under paragraph 2 of this section by nuclear power reactor licensees must provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to implement the principal functional areas of emergency response identified in paragraph 2.b of this section. Each exercise must provide the opportunity for the ERO to demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF, and joint information center. Additionally, in each 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 response. 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.~~

In the SOC for the 2011 EP Final Rule, the NRC discussed the addition of a new Section IV.F.2.j to Appendix E to require all nuclear power reactor licensees to provide an opportunity for the ERO to demonstrate proficiency in response to a wide spectrum of scenarios, including a "hostile action" and a loss of large areas of the plant due to fire or explosion. The NRC staff previously evaluated the need for hostile action enhancements in Section 4.2.1 of this safety evaluation. Section IV.F.2.j further provides that the ERO must demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF and joint information center. The NRC staff previously concluded that the functions of the control room, EOF, TSC, and the OSC may be combined into one or more locations in Sections 4.2.21, 4.2.22, and 4.2.29 of this safety evaluation. A dedicated joint information center is also not needed based on the analysis in Section 4.1.7 of this safety evaluation. At a decommissioning site, where only the SFP and its related support systems, structures, and components remain, there are no other facilities in which ERO personnel could demonstrate proficiency.

Based on the above analysis and the analyses provided in Sections 4.1.1, 4.2.1, 4.2.21, 4.2.22, 4.2.29, and 4.2.33 of this safety evaluation, the NRC staff concludes that the exempted language from Section IV.F.2.j to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

4.2.40 10 CFR Part 50, Appendix E, Section IV.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.~~

Based on the analysis provided in Section 4.2.1 of this safety evaluation, the NRC staff concludes that the enhancements for hostile actions, as required by the 2011 EP Final Rule, are not necessary for FCS in its permanently shutdown and defueled status. Therefore, the exempted language from Section IV.I to Appendix E of 10 CFR Part 50 above, is not necessary to achieve the underlying purpose of this requirement as it applies to FCS and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.0 ENVIRONMENTAL CONSIDERATIONS

The environmental considerations for the exemption request are addressed in Section III.E of the EP exemption associated with this safety evaluation.

6.0 CONCLUSION

The NRC staff has completed its review of the licensee's request for an exemption from certain requirements of 10 CFR 50.47(b), 10 CFR 50.47(c), and Appendix E to 10 CFR Part 50, as specified in this safety evaluation. On the basis of its review, the NRC staff concludes that the postulated dose to the general public from any remaining applicable design-basis accident would not exceed the EPA PAGs and, for any beyond-design-basis events impacting SFP integrity or the ability to cool spent fuel, the length of time available to implement pre-planned mitigation measures consistent with plant conditions and, if necessary, for offsite authorities to implement protective actions using a CEMP, "all-hazards," approach provides confidence that offsite measures for the public could be taken without preplanning. The conclusion is consistent with the staff's evaluation, as provided to the Commission in SECY-17-0080 (Reference 29), which was approved by the Commission in the SRM to SECY-17-0080 (Reference 30).

The review considered the permanently shutdown and defueled status of FCS and the low likelihood of any credible accident resulting in radiological releases requiring offsite protective measures. This SE was supported by the licensee's analyses and NRC staff's assessment of both design-basis accidents and beyond-design-basis accidents. The NRC staff concludes that the emergency planning requirements for FCS, as modified by the exemptions described in this SE, would provide: (1) an adequate basis for an acceptable state of emergency preparedness; and (2) in conjunction with arrangements made with offsite response agencies, reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at FCS.

Accordingly, the NRC staff has determined that, pursuant to 10 CFR 50.12(a), the exemptions evaluated above are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. Also, special circumstances are present. Specifically, the NRC staff finds the licensee's requested exemptions meet the underlying purpose of the planning standards in 10 CFR 50.47 and requirements in Appendix E to 10 CFR Part 50, and acceptably satisfy the special circumstances in 10 CFR 50.12(a)(2)(ii) in

view of the reduced risk of offsite radiological consequences associated with the permanently shut down and defueled state of the plant, and can be implemented as of April 7, 2018.

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Date: December 11, 2017

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 – EXEMPTIONS FROM CERTAIN
EMERGENCY PLANNING REQUIREMENTS AND RELATED SAFETY
EVALUATION (CAC NO. MF9067; EPID L-2016-LLE-0003)
DATED DECEMBER 11, 2017

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