Evaluation of Request by NextEra Energy Duane Arnold, LLC for Exemptions from Certain Emergency Planning Requirements for the Duane Arnold Energy Center.

The following U.S. Nuclear Regulatory Commission (NRC) staff evaluation verifies that NextEra Energy Duane Arnold, LLC (NEDA, the licensee) provided the analyses described in Section 5, "Evaluation of Exemptions to Emergency Planning 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 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14106A057). These analyses meet the criteria in the ISG to justify elimination of the requirement on the licensee to maintain the plume exposure pathway and ingestion pathway emergency planning zones (EPZs) and formal offsite radiological emergency preparedness (REP) plans. The discussion that follows lists each ISG criterion, followed by the NRC staff's evaluation of the licensee's consistency with that criterion for the Duane Arnold Energy Center (DAEC).

1. The licensee has performed an analysis indicating that any radiological release from the applicable remaining design-basis accident (DBA) would be within the dose limits of Section 50.67, "Accident source term," to Title 10 of the *Code of Federal Regulations* (10 CFR) and dose acceptance criteria in Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors." The licensee evaluated the maximum 2-hour total effective dose equivalent (TEDE) to an individual located at the exclusion area boundary (EAB), and the 30-day TEDE to an individual at the outer boundary of the low population zone and the control room. The resulting doses would not approach the U.S. Environmental Protection Agency (EPA) early phase protective action guides (PAGs) recommendation for protection of the public.[1]

   Evaluation: NEDA states that the irradiated fuel will be stored in the spent fuel pool (SFP) and an independent spent fuel storage installation (ISFSI). NEDA further states, and the NRC staff agrees, that while spent fuel remains in the SFP, the only postulated DBA that would remain applicable to the permanently defueled DAEC facility that could contribute a significant dose would be a fuel handling accident (FHA) in the Reactor Building, where the SFP is located.

   Fuel Handling Accident

   NEDA performed an analysis that shows that 19 days after permanent cessation of power operations, doses from an FHA would decrease to a level that would not warrant protective actions under the EPA early phase PAG framework and would meet the dose limit requirements under 10 CFR 50.67 and dose acceptance criteria under Regulatory Guide 1.183.

   NEDA requests that approved exemptions become effective 10 months following the permanent cessation of power operations at DAEC. Therefore, by the date of implementation of the exemptions, the fuel will have decayed for 10 months. The NRC staff notes that the doses from an FHA are dominated by the isotope Iodine-131. After

[1] Use of EPA early phase 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," and endorsed by the Commission in a policy statement published on October 23, 1979 ("Planning Basis for Emergency Responses to Nuclear Power Reactor Accidents," 44 *Federal Register* 61123).

10 months of decay, the thyroid dose from an FHA would be negligible. With 10 months of decay, the only isotope remaining in significant amounts, among those postulated to be released in a DBA FHA, would be Krypton-85. Because Krypton-85 primarily decays by beta emission, the calculated skin dose from an FHA release would make an insignificant contribution to the TEDE, which is the parameter of interest in the determination of the EPA early phase PAGs for sheltering or evacuation.

2. The licensee has performed an analysis demonstrating that after the spent fuel has decayed for 10 months, with a complete loss of SFP water inventory with no heat loss (i.e., adiabatic heat-up), a minimum of 10 hours would be available before any fuel cladding temperature reaches 900 degrees Celsius (°C) from the time all cooling is lost.

   Evaluation: The NRC staff evaluates the ability to mitigate beyond-design-basis events considering the time available to implement measures to maintain the fuel cool or, if necessary, implement an appropriate emergency response. The NRC staff uses an assessment of the adiabatic heat-up to determine the available time because adiabatic heat-up is generally the limiting condition. The heat-up time calculated is the time to reach a temperature of 900°C, which correlates to 1,652 degrees °F and the temperature where “runaway oxidation” (zirconium cladding fire) is expected to occur, as defined in NUREG-1738, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” dated February 2001 (ADAMS Accession No. ML010430066).

   The 10-hour criterion, conservatively, does not consider the time to uncover the fuel 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-hour criterion 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 addition, in the unlikely event that a release is projected to occur, 10 hours would provide sufficient time for offsite agencies, if deemed warranted, to take appropriate action to protect the health and safety of the public.

   NEDA has performed an analysis which shows that, 10 months after shutdown, the spent fuel stored in the SFP will have decayed to the extent that the requested exemptions may be implemented at DAEC without any additional compensatory actions. Given the permanent shutdown date of August 10, 2020, and the proposed fuel decay time of 10 months, the period in which the spent fuel could heat up to clad ignition temperature within 10 hours under adiabatic conditions would end on June 10, 2021. This analysis is contained in Attachment 2, “Calculation CAL-M19-001, "Adiabatic Heat-up Analysis of Drained Spent Fuel Pool (Zirconium Fire), Revision 1," to its application. The analysis determined the decay time necessary to ensure at least a 10-hour heat-up time considering the thermal capacity of the portion of the fuel assembly that heats uniformly and the decay heat rate of the fuel. The DAEC analysis shows that after the spent fuel has decayed for 10 months, for beyond-design-basis events where the SFP is drained and air cooling is not possible, at least 10 hours would be available from the time spent fuel cooling is lost until the hottest fuel assembly reaches a temperature of 900°C. This 10-hour minimum threshold provides sufficient time for the licensee to take mitigative actions, or if governmental officials deem warranted, for offsite protective actions to be initiated using a comprehensive approach to emergency planning.

The NRC staff reviewed the calculation to verify that important physical properties of materials were within acceptable ranges and the results were accurate. The NRC staff determined that physical properties were appropriate and completed independent confirmatory calculations that produced similar results. Therefore, the NRC staff found that after 10 months of decay, at least 10 hours would be available before a significant offsite release could begin. The NRC staff concluded that the adiabatic heat-up calculation provided an acceptable method for determining that a minimum of 10 hours would be available before any fuel cladding temperature reaches 900°C from the time all cooling is lost.

3. The licensee has performed an analysis for a loss of SFP water inventory resulting in radiation exposure at the EAB and the control room (which indicates that any release would be less than EPA early phase PAGs at the EAB).

   Evaluation: In Attachment 3, "CAL-R19-002 Dose at Site Exclusion Area Boundary and Main Control Room Due to Shine from Drained Spent Fuel Pool During SAFSTOR[2] Rev. 0," NEDA analyzed the radiological consequences of a beyond-design-basis scenario to evaluate the effects of a loss of water inventory from the 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 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, radiation protection personnel would restrict access to ensure that no one was subjected to the direct dose from the unshielded fuel.

   The SFP water and the concrete pool structure serve as radiation shielding. A loss of water shielding above the fuel could increase the offsite radiation levels because of the gamma radiation emitted skyward interacting with air molecules and subsequently scattering back down to the ground where it can expose members of the public (known as "skyshine"). The offsite and control room radiological impacts of a postulated complete loss of SFP water were assessed by DAEC. A loss of water shielding above the fuel could increase the offsite radiation levels because of the gamma rays streaming up out of the SFP being scattered back to a receptor at the site boundary. NEDA's analysis (Attachment 2 of the exemption request) has demonstrated that within 9 months after permanent cessation of power operations, the radiological consequences of the postulated accident will not exceed the limits of the EPA's PAGs at the EAB. The analysis provides that after 9 months of fuel decay, a postulated complete loss of SFP water would result in a gamma radiation dose rate of 0.21 millirem/hour at the EAB and the time to exceed the PAG limit of 1 roentgen equivalent man TEDE at the EAB following a SFP drain down is approximately 198 days, or about 6.5 months. Therefore, conditions 10 months following reactor shutdown are bounded. The dose rate to the control room was determined by the licensee to be <0.03 millirem/hour. While there are no acceptance criteria for the control room in ISG-02, the dose rate values are considered reasonably low. The NRC staff reviewed the licensee's analysis description and agrees that appropriate methods were used to evaluate the effects of this source of radiation at the control room and the EAB. Therefore, the NRC staff concludes that the

[2] SAFSTOR is a method of decommissioning in which a nuclear facility is placed and maintained in a condition that allows the facility to be safely stored and subsequently decontaminated (i.e., deferred decontamination) to levels that permit release for unrestricted use.

dose consequence from skyshine emitted from the SFP due to a loss of SFP normal cooling would not exceed a level that would warrant protective actions under the EPA early phase PAGs.

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).

   Evaluation: NEDA conducted a seismic evaluation in response to an NRC letter to all power reactor licensees, "Request for Information Pursuant to Title 10 of the *Code of Federal Regulations* Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML14092A331). This evaluation provided an assessment of earthquake probabilities at potentially damaging accelerations. The NRC accepted the results of this assessment indicating the low seismic hazard screening criteria had been satisfied at DAEC by letter dated February 18, 2016 (ADAMS Accession No. ML15364A544).

   The SFP is designed as a Seismic Category I structure. Additionally, NEDA has incorporated the Reactor Building structure, which includes the SFP structure, into the Maintenance Rule – Structures Monitoring Program. This program includes a validation by walkdown and drawing review that there are no changes or degradation to the structures and is completed every 2 years.

   Therefore, the NRC staff found reasonable assurance that Criterion 4 of NSIR/DPR-ISG-02 would be satisfied with respect to demonstrating a high confidence in a low probability of seismic failure for the DAEC Reactor Building, including the SFP structure.

5. If the licensee is storing fuel in an SFP, the licensee should address for the decommissioning site the risk reduction measures identified in NUREG-1738 as industry decommissioning commitments (IDCs) and staff decommissioning assumptions (SDAs).[3] The IDCs and SDAs are a set of design characteristics and operational capabilities that either help prevent a substantial loss of coolant inventory or increase the likelihood of recovery from such an event.

   Evaluation: In accordance with the safety analysis in NUREG-1738, the beyond-design-basis event sequences that dominate risk at a decommissioning nuclear power reactor are large earthquake and cask-drop events. This is an important difference relative to an operating nuclear 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 DAEC can be established by assessing the facility against

[3] The Nuclear Energy Institue (NEI) proposed IDCs in a letter to the NRC dated November 12, 1999 (ADAMS Accession No. ML993340413). The NRC identified several additional SDAs through the NRC staff's risk assessment and evaluation of the safety principles in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," for decommissioning plants. The IDCs and SDAs are summarized in Tables 4.2-1 and 4.2-2 to NUREG-1738.

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 5.5, "Comparison to NUREG-1738 Industry Decommissioning Commitments and Staff Decommissioning Assumptions," to its application, NEDA described the conformance of the DAEC facility and operations with the IDCs and the SDAs. In its discussion of the IDCs and SDAs, NEDA 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).

The NRC staff evaluation focused 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 DAEC SFP. The summary below of the NRC staff's findings, is 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," dated July 1980 (ADAMS Accession No. ML070250180) will be implemented).

Evaluation: Heavy load lifts in and around the area of the SFP are performed by the reactor building crane. The design of the crane is single failure-proof. Therefore, the likelihood of dropping the spent fuel casks in and around the SFP is extremely low. The design meets the requirements of NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants," dated July 1979 (ADAMS Accession No. ML110450636), and Appendix C, "Control of Heavy Loads at Nuclear Power Plants," of NUREG-0612. NEDA states that the DAEC procedures provide instructions for lifting activities to meet the guidance provided in NUREG-0612.

Because the reactor building crane is single failure-proof, an accidental load drop is considered not to be a credible event such that condition 5.1.2(1) of NUREG-0612 is satisfied and analysis of cask-drop accidents in accordance with condition 5.1.2(4) of NUREG-0612 is not required. Therefore, the NRC staff finds that NEDA satisfies NUREG-1738 IDC #1.

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.

Evaluation: NEDA states that DAEC has procedures in place to ensure onsite and offsite resources can be brought to bear during an event. Once DAEC is permanently shut down and defueled, the on-shift plant operators, including certified fuel handlers

and non-certified operators, will be appropriately trained on the relevant procedures and on the various actions needed to provide makeup to the SFP.

NEDA also lists procedures that provide guidance for initiating and maintaining communications between offsite agencies and the onsite emergency response organization during severe weather and seismic events. FLEX-AB-100-1003, "SAFER Response Plan for Duane Arnold Energy Center," contains an offsite resource list which shows providers, their capabilities, and a contact telephone number.

Therefore, the NRC staff concludes NEDA 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.

Evaluation: NEDA stated that SFP level instrumentation provides indication and alarm to the control room. This consists of two pool level instruments installed in accordance with NRC Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012 (ADAMS Accession No. ML12054A679), with indication in the control room. By letter dated May 26, 2017 (ADAMS Accession No. ML17129A037), the NRC staff concluded that NEDA's proposed location and design of the SFP level instrumentation displays appear to be consistent with the NEI document NEI 12-02, "Industry Guidance for Compliance With NRC Order EA-12-051, to Modify Licenses With Regard to Reliable Spent Fuel Pool Instrumentation," Revision 1 (ADAMS Accession No. ML12240A307), guidance, as endorsed by JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation" (ADAMS Accession No. ML12221A339), and should adequately address the requirements of the order.

The SFP is also equipped with a local level indicator (ruler) for alternate means of determining SFP level. The SFP system temperature is continuously monitored in the control room. There are four area radiation monitors on the refuel floor that provide remote indication and annunciation in the control room. A local alarm to notify personnel of high area radiation levels is also in place. In addition, each radiation monitor provides input to the plant process computer.

Therefore, the NRC staff concludes that NEDA 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 uncovery in the event of seal failure shall be self-limiting to leakage or otherwise engineered so that drainage could not occur.

Evaluation: NEDA states that the DAEC SFP gate are static seals, and there is no credible catastrophic failure mechanism for these seals. If SFP inventory were to leak due to seal rupture or degradation, the level would not go below the top of the spent fuel racks. The fixed elevation of the bottom of the refueling slot between the SFP and the reactor vessel where the gates are located is above the top of spent fuel. Therefore,

leakage by the gates could not lead to fuel uncovery. Additionally, DAEC has a flow indicating switch installed to monitor for any leakage past the SFP gates.

The NRC staff finds that the described design features that limit the potential for drainage through the fuel transfer system and SFP cooling system 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, and (2) controls for pump suction and discharge points. The functionality of anti-siphon devices will be periodically verified.

Evaluation: NEDA noted that the cask pool gate prevents cask evolutions from affecting SFP level and DAEC procedure Dry Fuel Storage (DFS)-201, "Dry Shielded Canister/Transfer Cask Preparation for Fuel Loading Operations," meets the requirements of the IDC by controlling the draining methods to prevent affecting SFP level. There are no connections to the SFP that could allow the fuel pool to be drained below the pool gate between the reactor well and fuel pool.

NEDA further described the return cooling water supply piping terminates just below the surface of the SFP. That piping contains passive vacuum breaking vent pipes that prevent any siphoning from occurring on the return lines. These vent pipes are easily observable to verify the absence of any obstructions, and they require no testing since there are no moving parts. The suction piping is routed from the skimmer surge tanks that are connected to the SFP via SFP overflow weirs that maintain SFP level at the required level.

The NRC staff concludes that the physical configuration of inlet and outlet connections and use of anti-siphon devices, provide adequate control to 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.

Evaluation: NEDA indicated that site procedures, Abnormal Operating Procedure (AOP) 435, "Loss of Spent Fuel Pool Cooling (All Modes) / Inventory (Mode 4 and 5)," Supplemental Emergency Procedure (SEP) 312, "Loss of Spent Fuel Pool Inventory," SEP 314, "Loss of Spent Fuel Pool Cooling" and Severe Accident Management Procedure (SAMP) 712, "Spent Fuel Pool Makeup and Spray," all provide guidance for SFP makeup utilizing various water sources, with or without access to the refuel floor.

The NRC staff finds that the planned SFP cooling and make-up water capability, with access to numerous sources of make-up inventory, conforms to the capabilities assumed for the NRC 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.

Evaluation: NEDA states that procedures DFS-201 and AOP 435, both require the cask pool gate be installed prior to draining inventory from the cask pool. The cask pool gate prevents cask evolutions from affecting SFP level, and the procedures DFS-201 and AOP 435 meet the requirements of the IDC by controlling the draining methods to prevent affecting SFP level.

Movement of the dry storage cask and other heavy loads in the vicinity of the SFP is performed in accordance with procedure Administrative Control Procedure (ACP) 1408.19, "Control of Generic Heavy Loads," and DFS-201 which ensure the criteria of NUREG-0612 are met for heavy loads. As stated in NUREG-1738, having procedures in place helps reduce the chance of human errors, especially under stressful conditions such as during a severe accident.

The NRC staff finds the described procedures are consistent with the administrative controls considered in the NRC 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.

Evaluation: NEDA references procedure AOP 435, which lists the makeup sources to use in the event of a loss of SFP inventory, with or without access to the refueling floor (5th floor of the reactor building). Various systems used in that procedure are either routinely used or tested in accordance with Technical Specification or other administrative requirements. For instance, makeup to the skimmer surge tanks via condensate service water is utilized on a daily basis to make up for evaporative loses from the SFP. In addition, SFP cooling risk and equipment out of service times are managed in accordance with procedure OP-AA-104-1010, "Spent Fuel pool Risk Management."

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

SDA #1: 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.

Evaluation: Section 9.1.2.3.3.1, "Design Requirements," of the DAEC Updated Final Safety Analysis (ADAMS Accession No. ML19100A055) states that the SFP is designed as a Seismic Category I structure, i.e., designed to withstand a safe shutdown earthquake. The SFP cooling system is as originally designed and does not include temporary configurations which would result in loss of margin or unanalyzed drain paths.

The instrumentation includes dual, independent-level monitors with indicators and alarms in the control room. Temperature indication and alarms are also available.

The SFP cooling system has redundant pumps, redundant heat exchangers and multiple makeup sources, including the fire protection system. NEDA states that the DAEC's fire protection system includes an electric-driven fire pump and a diesel-driven fire pump, both of which will be maintained until all fuel is removed from the SFP. Each fire pump has the capability to deliver 500 gallons per minute of makeup water to the SFP.

The NRC staff finds the described cooling and makeup capabilities are comparable to the capabilities considered in the NRC 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.

Evaluation: NEDA states that DAEC performs in-plant walk-downs of the refuel floor and SFP demineralizer instruments for system pressure and flow (which will indicate a system problem) each shift, as directed by operator rounds. Additionally, in-plant skimmer surge tank level and SFP pump checks are performed once per day as directed by operator rounds. The daily monitoring of skimmer surge tank level and SFP pumps are adequate since the continuous indication of SFP level in the control room and shiftly monitoring of refuel floor and demineralizers will indicate any problems with SFP system operation.

NEDA states that DAEC procedures meet the requirements of this SDA by providing the guidance on the capability and availability of permanent and portable makeup sources. AOP 901 directs the inspection of the SFP and cooling systems following a seismic event. AOP 435 includes methods to diagnose the loss of cooling and/or inventory and direction to establish makeup. SAMP 712, “Spent Fuel Pool Makeup and Spray,” provides direction in a beyond-design-basis external event (BDBEE)

NEDA has determined that for a loss of SFP cooling with no makeup capabilities, the total time to boil the SFP and to reduce SFP water inventory to a point 10 feet above the top of the highest point of the fuel assembly is calculated to be 2.8 days total. The 2.8-day period is based on the expected decay heat load following a 90-day period after reactor shutdown. NEDA indicated that 90 days after permanent shutdown, adequate time and water resources will be available to restore SFP cooling to maintain the SFP water level 10 feet above the top of the spent fuel and the low decay heat and long time to boil off inventory provides sufficient time for DAEC to sustain the SFP cooling function indefinitely. Specifically, DAEC's standard portable fire pumps deliver adequate head and flow to provide the minimum required makeup to the SFP. NEDA states that the equipment can be installed within 2 hours by the minimum onshift operations personnel to deliver SFP makeup. The necessary equipment and installation procedures are required to be maintained per DAEC Operating License section 2.C.(9), “Mitigation Strategy License Condition,” item (b)(7).

The NRC staff finds that the monitoring of the SFP systems are consistent with the NRC staff analysis presented in NUREG-1738 based on the improvements in SFP monitoring

capability and reliability implemented since the publication of NUREG-1738, specifically in response to the Fukushima accident.

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 an emergency.

Evaluation: NEDA states indication for SFP level is provided in the control room as well as locally in the plant. A control room annunciator will actuate when level is low or level is high. Additionally, if a high- or low-level condition exists, an alarm light (red) will illuminate on local panels in the plant. Two independent indicators for SFP level are also provided on the control room back panels for use during a BDBEE.

NEDA states that a temperature element on the common suction to the fuel pool cooling pumps provides temperature indication to the recorder, Temperature Recorder Switch 1945, which is located in the control room.

NEDA states there are procedures in place to respond to an abnormally low level in the SFP to direct the plant staff to take appropriate actions to provide the necessary SFP makeup; first through normal means, then by utilizing all available onsite resources, including both design-basis and defense-in-depth capabilities. Refer to NEDA responses for IDC 2 and IDC 4 for details associated with calling in offsite resources.

The NRC staff finds that the SFP monitoring capability is consistent with the assumptions in the analysis presented in NUREG-1738.

SDA #4: The 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.

Evaluation: NEDA states that the DAEC SFP cooling system has not been modified from the original design in order to enter into the decommissioning process.

The normal pool operating level is elevation (EL) 853 feet (′) – 8 inches (″). Top of active fuel installed in the fuel storage rack is at 830′-3″. The water in the SFP returns to the SFP cooling system via a skimmer weir that can be set to maintain SFP level as low as EL 853′-6.5″. There are no lower elevation piping penetrations in the SFP. The bottom of the fuel transfer gate connecting the SFP to the reactor cavity is at EL 831′-2.75″. The bottom of the cask pool gate opening is EL 832′-3″. The SFP cooling inventory is normally supplied through two 6″ pipes that discharge into the SFP at EL 850′. These discharge lines each include a ¾″ highpoint vent (welded at EL 852′-6″ and open to atmosphere at EL 853′-3″), which act as vacuum breakers to prevent siphoning of the pool through the primary make-up piping. Therefore, although draining of more than 15′ below normal pool operating level could occur, there is no drain path that would drain water below the top of the fuel.

NEDA maintains procedures and guidelines in place to obtain offsite assistance, if necessary, for mitigation of events that result in significant loss of SFP inventory. These

mitigating strategies are implemented as part of the procedure AOP 435 and are also included in DAEC's Mitigation Strategy License Condition requirements.

The NRC staff concludes that the SFP design protections against drainage are consistent with the assumptions used in the analysis presented in NUREG-1738.

SDA #5: Load drop consequence analysis will be performed for facilities with non-single, 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.

Evaluation: NEDA states that heavy load lifts in and around the area of the SFP are performed by the reactor building crane. NEDA has procedures directing use of the installed single-failure-proof crane and lifting devices as specified in NUREG-0612 for such loads. Therefore, performance of load drop consequence analyses is not required.

SDA #6: Each decommissioning plant will successfully complete the seismic checklist provided in Appendix 2B to 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 NUREG-1738 ($<1 \times 10^{-5}$ per year including non-seismic events).

Evaluation: NEDA conducted a seismic evaluation in response to Recommendation 2.1 of the Near Term Task Force review of the accident at the Fukushima Dai-ichi nuclear facility. This evaluation included the SFP and was submitted to the NRC for review. This evaluation provides a specific assessment of earthquake probabilities versus acceleration for DAEC, and concludes, regardless of response spectral frequency, the probability is less than 2×10^{-6}/year. The NRC review of this evaluation is included as one of the references in Attachment 1, "Request for Exemptions from Portions of 10 CFR 50.47(b), 10 CFR 50.47(c)(2) and 10 CFR Part 50, Appendix E," to the NEDA exemption request.

Additionally, NEDA has also included the reactor building structure (and SFP) into the Maintenance Rule - Structures Monitoring Program. This requires a validation by walkdown and drawing review that there are no changes or degradation of the equipment, structure and components and is completed every 2 years. This will continue until all fuel is removed from the pool.

In addition, as documented in the Enhanced Seismic Checklist (NUREG 1738 Appendix 2B, Attachment 1), risks associated with a seismic event are mitigated by delaying any licensing waivers (emergency plan, insurance etc.) until after the zirconium cladding fire time period. As this amendment will not be implemented until after the zirconium cladding fire period (10 months), overall risk is reduced even further.

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.

Evaluation: The DAEC spent fuel racks utilize Boral, rather than Boraflex, as the neutron absorbing material. As required by DAEC Technical Specification 5.5.15, "Spent Fuel Pool Neutron Absorber Monitoring Program," a program is in place to manage loss of material and reduction of neutron absorption capacity of Boral neutron absorption panels in the spent fuel racks. The loss of material and the reduction of the neutron-absorbing capacity will be determined through coupon testing for Holtec spent fuel racks and in situ testing for Programmed and Remote Systems Corporation spent fuel racks. Such testing will include periodic verification of boron loss through areal density measurement of coupons or through direct in situ techniques, such as measurement of boron areal density and measurement of geometric changes in the material, and detection of gaps through blackness testing.

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.

In addition to an evaluation against the specific NSIR/DPR-ISG-02 criteria above, Table 1, "Evaluation of Specific Exemptions to Emergency Planning Requirements," provides the NRC staff's evaluation of NEDA's specific exemptions, shown as "strikethrough" text, requested from the requirements of 10 CFR 50.47 and Appendix E to Part 50, based on the justification provided by NEDA and evaluation criteria above.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
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:
NRC Staff's Evaluation: The NRC requires a level of licensee emergency preparedness and planning (EP) commensurate with the potential consequences to public health and safety, and common defense and security at the licensee's site. NEDA's exemption request included radiological analyses to show that, as of 9 months after the permanent cessation of power operations, the radiological consequences of the only remaining applicable DBA would not exceed the limits of the EPA early phase PAGs at the EAB. NEDA also concluded, and the NRC staff confirmed, as of 10 months after the permanent cessation of power operations, in the unlikely event all cooling is lost to the spent fuel and a heat up under adiabatic conditions resulted, 10 hours would be available to take mitigative actions before the hottest fuel assembly reached 900˚C. NUREG-1738, and enhancements put into place as a result of the events of September 11, 2001, and the Fukushima Dai-ichi accident, support the NRC staff assumption 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 offsite response organizations (OROs) to implement these measures using comprehensive emergency management plan or "all hazards" approach. 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 (i.e., the time 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 considered necessary for a permanently shutdown and defueled nuclear power reactor.
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.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
NRC Staff's Evaluation: NUREG-0396 provided that emergency response plans should be useful for responding to any accident that would produce offsite radiological doses in excess of the EPA early phase PAGs. Additionally, it 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. As previously discussed, NEDA has provided radiological analyses, which show that as of 9 months after permanent cessation of power operations, the radiological consequences for the remaining applicable DBA at DAEC will not exceed the limits of the EPA early phase PAGs at the EAB. In addition, reactor core melt (Class 9) scenarios, which were also considered in NUREG-0396, are no longer applicable to a permanently shutdown and defueled power reactor. Considering the very low probability of beyond-design-basis events affecting SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, designated plume exposure and ingestion pathway EPZs are no longer needed.
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.
NRC Staff's Evaluation: With the termination of reactor power operations at DAEC 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 will be 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 (RCS), and secondary systems 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, RCS, 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. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, an EOF would not be needed to coordinate these types of assessments for determining public protective actions. Onsite staff will continue to maintain and provide for communication and coordination capabilities with offsite

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
authorities for the purpose of notification and for the level of support required for the only remaining applicable DBA and the prompt implementation of mitigative actions in response to an event affecting the SFP.
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~~.
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. The DAEC Emergency Plan will continue to maintain arrangements for requesting and using assistance resources from offsite support organizations. Therefore, minimum initial offsite response measures are not required.
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 the populace within the plume exposure pathway Emergency Planning Zone have been established~~.
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), 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.
10 CFR 50.47(b)(6): Provisions exist for prompt communications among principal response organizations to emergency personnel~~ and to the public~~.
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), 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 EPZ in regard to initial or pre-determined protective actions is no longer needed.
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.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), 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 EPZ on how they will be notified and what their initial or predetermined protective actions should be in an emergency is not needed.
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.
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), 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.
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.~~
NRC Staff's Evaluation: NEDA's analysis demonstrated that, as of 9 months after the permanent cessation of power operations, 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 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 potassium iodide distribution would no longer serve as an effective or necessary supplemental protective action. As such, the NRC staff concludes that NEDA provides for an acceptable level of EP at DAEC 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 DAEC. 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

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
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.
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.~~
NRC Staff's Evaluation: 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 (i.e., between the loss of both water and air cooling to the spent fuel and the time 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 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 provision is not applicable to DAEC because it is not a gas-cooled reactor and has permanently ceased power operations. Therefore, no exemption is required.
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.
NRC Staff's Evaluation: The 2011 EP Final Rule (76 *Federal Register* 72560; November 23, 2011) made generically applicable the security-based response elements of NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," dated July 18, 2005 (ADAMS Accession No. ML051740058). The enhancements of NRC Bulletin 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. NEDA has certified that it has permanently ceased operations at DAEC and that all fuel has been removed from the reactor vessel. Therefore, the requirement for onsite protective actions during hostile action is not necessary for DAEC.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
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 power reactor also has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating power reactor. For all of the above reasons, the NRC staff concludes that a decommissioning power reactor is not a facility that falls within the definition of "hostile action." Although this analysis provides a justification for exempting DAEC 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.
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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR 50.47(b)(10).
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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.2.
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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.2
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~~

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
~~between decennial censuses and shall submit these estimates to the NRC with any updated ETE analysis.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.2.
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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.2.
10 CFR Part 50, Appendix E, Section IV.A.1: A description of the normal plant ~~operating~~ organization.
Staff's Evaluation: Because the NRC docketed the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, the 10 CFR Part 50 license for DAEC no longer authorizes operation of the DAEC reactor, or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Because NEDA is no longer authorized to operate the reactor, DAEC 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.
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.~~
NRC Staff's Evaluation: 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. NEDA furnished information concerning its SFP inventory makeup strategies that could be used in the event of a catastrophic loss of SFP water inventory and states that designated on-shift personnel will be trained to implement such strategies with equipment maintained onsite. DAEC will have site personnel designated to respond within 2 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.
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.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
NRC Staff's Evaluation: NEDA's analyses demonstrated that, as of 9 months after permanent cessation of power operations, no DBA would result in doses in excess of the EPA early phase PAGs to the public beyond the EAB. While it is unlikely that a beyond-DBA 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 this regulatory provision. If a release is occurring, then the licensee's staff should promptly 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. Considering the very low-probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, offsite dose projections are not required.
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.~~
NRC Staff's Evaluation: NEDA 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. NEDA will have 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 the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, personnel with special qualifications, as directed in 10 CFR Part 50, Appendix E, Section IV.A.5, are not required.
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, 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.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.1.
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.~~
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), 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, and ordering appropriate protective actions, including evacuations when necessary, is no longer required.
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.~~
NRC Staff's Evaluation: As part of the 2011 EP Final Rule, the NRC concluded that the staffing analysis requirement was not necessary for non-power reactor licensees because staffing at non-power reactors is generally small, which is commensurate with operating the facility in a manner that is protective of the public health and safety. The similarities with regard to staffing between DAEC and non-power reactors show that the DAEC facility should be treated in a similar fashion as a non-power reactor for purposes of EP. Therefore, a detailed staffing analysis is not needed for a decommissioning reactor.
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.
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, a decommissioning reactor is not required to have emergency action levels (EALs) to determine protective measures offsite. With respect to EALs for hostile action, refer to basis for exemption from 10 CFR

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
Part 50, Appendix E, Section IV.1.
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 [Federal Emergency Management Agency]-REP-1.
NRC Staff's Evaluation: For a permanently shutdown and defueled power reactor, containment pressure and emergency core cooling system are no longer required. Therefore, they would have no parameters indicating a potential emergency. Other indications, such as SFP level, SFP temperature, and area radiation monitors indicate the conditions at DAEC. NEDA's analysis demonstrated that, as of 9 months after the permanent cessation of power operations, no credible events within the DBA would reach the dose criteria for the declaration of a Site Area Emergency or a General Emergency. As discussed previously, the probability of a beyond-DBA condition that could reach emergency classifications of a Site Area Emergency or a General Emergency is very low. In the unlikely event of a severe beyond-DBA resulting in the loss of all cooling to the stored fuel, as of 10 months after the permanent cessation of power operations, it would take at least 10 hours from the time the fuel is uncovered until it reaches a temperature of 900˚C. During this time, DAEC could initiate mitigative actions consistent with plant conditions. The need for offsite radiation monitoring systems in support of event classification above an Alert classification level is no longer required because of 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.
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.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
NRC Staff's Evaluation: NEDA states that it will maintain the capability to assess, classify, and declare an emergency condition within 30 minutes after the availability of indications to operators that an EAL threshold has been reached. In the 2011 EP Final Rule, non-power reactor licensees were not required to assess, classify, and declare an emergency condition within 15 minutes. An SFP and an ISFSI are also not nuclear power reactors as defined in the NRC's regulations. Like non-power reactors and ISFSIs, a decommissioning power reactor has a low likelihood of a credible accident resulting in radiological releases requiring offsite protective measures. For these reasons, the NRC staff concludes that a decommissioning power reactor should not be required to assess, classify, and declare an emergency condition within 15 minutes.
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~~.
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR 50.47(b) and 10 CFR 50.47(b)(10).
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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.D.1.
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~~

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
~~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.~~
NRC Staff's Evaluation: NEDA proposes in its exemption requests to complete emergency notifications within 60 minutes after an emergency declaration or a change in classification to the State of Iowa and local government agencies. This timeframe is consistent with the 10 CFR 50.72(a)(3) notification time to the NRC and is appropriate because in the permanently defueled condition, the rapidly developing scenarios associated with events initiated during reactor operation are no longer credible. Also refer to basis for exemption from 10 CFR 50.47(b) and 10 CFR 50.47(b)(10).
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.~~
NRC Staff's Evaluation: Refer to the basis for exemption from 10 CFR Part 50, Appendix E, Section IV.D.3 regarding the alert and notification system requirements.
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;
NRC Staff's Evaluation: The Technical Support Center (TSC) is an area located close to the control room that provides plant management and technical support to the reactor operating personnel located in the control room during emergency conditions. It has technical data displays and plant records available to assist in the detailed analysis and diagnosis of abnormal plant conditions and any significant release of radioactivity to the environment. The TSC is also the primary communications center for the plant during an emergency. With the permanently shutdown and defueled status of the DAEC reactor and the storage of the spent nuclear fuel in the SFP and ISFSI, the TSC and EOF will no longer be required to meet their original purpose during an emergency or support initial SFP mitigation actions if needed. The basis for the EOF exemption is provided in the basis for exemption from 10 CFR 50.47(b)(3).

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
10 CFR Part 50, Appendix E, Section IV.E.8.a.(ii): ~~For nuclear power reactor licensees, a licensee onsite operational support center;~~
NRC Staff's Evaluation: The Operations 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. With the permanently shutdown and defueled status of the DAEC reactor and the storage of the spent nuclear fuel in the SFP and ISFSI, an OSC will no longer be required to meet its original purpose during an emergency or support initial SFP mitigation actions if needed. NEDA states that an onsite facility will continue to be maintained, from which effective direction can be given and effective control may be exercised during an emergency.
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;~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR 50.47(b)(3).

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
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~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR 50.47(b)(3).
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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.1 regarding "hostile action."
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;~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR 50.47(b)(3).
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.
NRC Staff's Evaluation: DAEC will maintain communications with the State of Iowa, local government agencies and the NRC. Refer to basis for exemption from 10 CFR 50.47(b) and 10 CFR 50.47(b)(10).
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.~~

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not needed. 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, performing annual testing of communications among them is no longer required. Communications with State and local governments will be through the commercial phone system. Due to its frequency of use, the testing of that system is not necessary.
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.
NRC Staff's Evaluation: Based on the smaller facility staff and the greatly reduced required interaction with State and local emergency response facilities, 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 discussed previously, there is no need for the TSC and EOF. As a result, communications between the EOF and TSC and the NRC, and monthly testing of these capabilities are no longer needed. The Emergency Notification System used to communicate with the NRC will continue to be tested monthly.
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~~.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
NRC Staff's Evaluation: Decommissioning power reactor sites typically have a level of emergency response that does not require additional response by the licensee's headquarters personnel. Therefore, the NRC staff considers exempting the licensee's headquarters personnel from training requirements to be reasonable. Due to the low probability of DBA or other credible events to exceed the EPA early phase PAGs, offsite emergency measures are limited to support provided by local police, fire departments, and ambulance and hospital services, as appropriate. Local news media personnel no longer need radiological orientation training since they will not be called upon to support the formal Joint Information Center. The term "Civil Defense" is no longer commonly used, so references to this term in the regulation are not needed.
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.
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.D.1.
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.~~ [**F.2.a.(i), (ii), and (iii)** are not applicable.]
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, conducting a full participation exercise with State and local agencies is not required. 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.
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

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
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.
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.F.2.a for the basis for exemption from requirements related to offsite actions. The basis for the TSC exemption is provided in the basis for exemption from 10 CFR Part 50, Appendix E, Section IV.E.8.a.(i). The basis for the OSC exemption is provided in the basis for exemption from 10 CFR Part 50, Appendix E, Section IV.E.8.a.(ii). The basis for the EOF exemption is provided in the basis for exemption from 10 CFR 50.47(b)(3).
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, 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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.F.2.a.

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.2.
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.
NRC Staff's Evaluation: NEDA should provide the opportunity for any State and local Government agencies identified in the permanently defueled emergency plan to participate in licensee's drills and exercises upon request. Also see the basis for exemption from 10 CFR Part 50, Appendix E, Section IV.2.
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.~~
NRC Staff's Evaluation: Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), 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. Because the NRC staff previously concluded that full participation emergency plan exercises are not required, and FEMA does not have responsibilities related to onsite EP, NRC consultation with FEMA is not necessary.
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.
NRC Staff's Evaluation: For decommissioning power reactor sites, there are limited events that could occur and, as such, the purpose of ensuring that responders do not get preconditioned to certain scenarios is not necessary to achieve the underlying

Table 1 **Evaluation of Specific Exemptions to Emergency Planning Requirements**
purpose of this rule provision. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), 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.
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 8-calendar-year exercise cycle, nuclear power reactor licensees shall vary the content of scenarios during exercises conducted under paragraph 2 of this section to provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to respond to the following scenario elements: hostile action directed at the plant site, no radiological release or an unplanned minimal radiological release that does not require public protective actions, an initial classification of or rapid escalation to a Site Area Emergency or General Emergency, implementation of strategies, procedures, and guidance under § 50.155(b)(2), and integration of offsite resources with onsite~~ justification~~. The licensee shall maintain a record of exercises conducted during each 8-year exercise cycle that documents the content of scenarios used to comply with the requirements of this paragraph. Each licensee shall conduct a hostile action exercise for each of its sites no later than December 31, 2015. The first 8-year exercise cycle for a site will begin in the calendar year in which the first hostile action exercise is conducted. For a site licensed under 10 CFR Part 52, the first 8-year exercise cycle begins in the calendar year of the initial exercise required by section IV.F.2.a of this appendix.~~
NRC Staff's Evaluation: For decommissioning power reactor sites, there are limited events that could occur and, as such, the purpose of ensuring that responders do not get preconditioned to certain scenarios is not necessary to achieve the underlying purpose of this provision. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), 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.
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.~~
NRC Staff's Evaluation: Refer to basis for exemption from 10 CFR Part 50, Appendix E, Section IV.E.8.d.