Evaluation of Exelon Generation Company, LLC's Request for Exemptions from Certain Emergency Planning Requirements for the Oyster Creek Nuclear Generating Station

The following U.S. Nuclear Regulatory Commission (NRC) staff evaluation verifies that the Exelon Generation Company, LLC (Exelon) provided the analyses suggested 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 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 emergency planning zones (EPZs) and formal offsite radiological emergency preparedness (REP) plans and preparedness.

1. The licensee has performed an analysis indicating that any radiological release from applicable design-basis-accidents would be within Section 50.67 to Title 10 of the *Code of Federal Regulations* (10 CFR) dose limits and Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," dose acceptance criteria. The licensee evaluated the maximum 2-hour total effective dose equivalent (TEDE) to an individual located at the exclusion area boundary (EAB), 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]

   The licensee has stated, and the staff agrees, that while spent fuel remains in the spent fuel pool (SFP), the only postulated design-basis accident that would remain applicable to the permanently defueled Oyster Creek Nuclear Generating Station (OCNGS) that could contribute a significant dose will be a fuel handling accident (FHA) in the Reactor Building, where the SFP is located. For completeness, the staff also evaluated the applicability of other design-basis accidents documented in the OCNGS Updated Final Safety Analysis Report (UFSAR) (ADAMS Accession No. ML15307A558), to ensure that these accidents would not have consequences that could potentially exceed the 10 CFR 50.67 dose limits and Regulatory Guide 1.183 dose acceptance criteria or approach the EPA early phase PAGs.

   Fuel Handling Accident – In the OCNGS UFSAR, the licensee has determined that within 33 days after shutdown, the FHA doses would decrease to a level that would not warrant protective actions under the EPA early phase PAG framework, notwithstanding meeting the dose limit requirements under 10 CFR 50.67 and dose acceptance criteria under Regulatory Guide 1.183.

   The staff notes that the doses from an FHA are dominated by the isotope Iodine-131. The licensee has based its application for revision to the emergency plan and emergency action level (EAL) scheme on an effective implementation date no earlier than 12 months after shutdown. The date of cessation of power operations will occur no

[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 (44 *Federal Register* 61123).

later than October 31, 2018. Therefore, by the date of implementation of the revised emergency plan and EAL scheme, the fuel will have decayed for 12 months. With 12 months of decay, the thyroid dose from an FHA would be negligible. After 12 months of decay, the only isotope remaining in significant amounts, among those postulated to be released in a design-basis accident FHA, would be Krypton-85. Since Krypton-85 primarily decays by beta emission, the calculated skin dose from an FHA analysis would make an insignificant contribution to the TEDE, which is the parameter of interest in the determination of the EPA early phase PAGs for sheltering or evacuation. The staff concludes that the dose consequence from an FHA for the permanently defueled OCNGS would not approach the EPA early phase PAGs.

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

   The 10-hour criterion, conservatively, does not take into account the fuel uncovery time and assumes instantaneous loss of cooling to the fuel. The 10-hour time period is also not intended to represent the time that it would take to repair all key safety systems or to repair a large SFP breach. The 10 hours is a conservative period of time in which pre-planned mitigation measures to provide makeup water or spray to the SFP can be reliably implemented before the onset of a zirconium cladding ignition; and, if a release is projected to occur, 10 hours will be sufficient time for offsite agencies to take appropriate action to protect the health and safety of the public.

   In the analysis provided in Attachment 2, “Oyster Creek Nuclear Generating Station Zirconium Fire Analysis for Drained Spent Fuel Pool (Calculation C-1302-226-E310-457),” to the application, as supplemented by letters dated March 8, 2018, and March 19, 2018 (ADAMS Accession Nos. ML18067A087 and ML18078A146, respectively), the licensee compared the conditions for the hottest fuel assembly stored in the SFP to a criterion proposed in SECY-99-168, “Improving Decommissioning Regulations for Nuclear Power Plants” (ADAMS Accession No. ML12265A598), applicable to offsite emergency response for the unit in the decommissioning process. This criterion considers the time for the hottest assembly to heat up from 30°C to 900°C adiabatically. If the heat-up time is greater than 10 hours, then offsite emergency preplanning involving the plant is not necessary. Based on the limiting fuel assembly for decay heat and adiabatic heatup analysis presented in Attachment 2, at 12 months (365 days) after permanent cessation of power operations (i.e., 12 months decay time), the time for the hottest fuel assembly to reach 900°C is 10 hours after the assemblies have been uncovered. As stated in NUREG-1738, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants” (ADAMS Accession No. ML010430066), 900°C is an acceptable temperature to use for assessing onset of fission product release under transient conditions (to establish the critical decay time for determining availability of 10 hours for deployment of mitigation equipment and, if necessary, for offsite agencies to take appropriate action to protect the health and safety of the public, if fuel and cladding oxidation occurs in air).

   The staff reviewed the calculation to verify that important physical properties of materials were within acceptable ranges and the results were accurate. The staff determined that physical properties were appropriate. Therefore, the staff found that after 12 months, more than 10 hours would be available before a significant offsite release could begin.

The staff concluded that the adiabatic heat-up calculation provided an acceptable method for determining the minimum time available for deployment of mitigation equipment and, if necessary, implementing measures under a comprehensive general emergency plan.

3. The licensee has performed an analysis demonstrating that radiation exposure resulting from skyshine due to a loss of SFP water inventory at the EAB and control room (indicates less than EPA early phase PAGs at the EAB).

   The licensee 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 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 scattered back down to the ground where it can expose members of the public (known as skyshine). 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 application provides that the offsite and control room radiological impacts of a postulated complete loss of SFP water were assessed in Calculation C-1302-226-E310-458, “Dose at Exclusion Area Boundary and Control Room Due to Shine from Drained Spent Fuel Pool During SAFSTOR.” The licensee determined that the skyshine dose rate at the EAB would be limited to small fractions of the EPA early phase PAGs. The extended period required to exceed the EPA early phase PAG limit would allow sufficient time to develop and implement onsite mitigative actions and provide confidence that additional offsite measures could be taken without planning if efforts to reestablish shielding over the fuel are delayed. The staff reviewed the license’s evaluation and performed independent analyses which confirmed the licensee’s results. The staff determined that after 1-year post shutdown, the EAB dose rate is approximately 2.2 mrem/hour and the control room dose rate is approximately 35 mrem/hour.

   Therefore the staff concludes that the dose consequence from skyshine emitted from the SFP due to a loss of SFP normal cooling will not exceed a level that would warrant protective actions under the EPA early phase PAG framework.

4. Considering the site-specific seismic hazard, the licensee has performed either an evaluation demonstrating a high-confidence of a low-probability (less than 1×10^{-5} per year) of seismic failure of the SFP storage structure, or an analysis demonstrating the fuel has decayed sufficiently that natural air flow in a completely drained pool would maintain peak cladding temperature below 565˚C (the point of incipient cladding damage).

   The licensee completed a seismic evaluation in response to a request for information pursuant to the requirements of 10 CFR 50.54(f) regarding recommendation 2.1 of the NRC’s Near-Term Task Force Review of insights from the Fukushima Dai-ichi Accident.

The licensee performed the seismic evaluation consistent with NRC guidance and determined that the SFP value for high-confidence of low-probability of failure for the once per 100,000-year hazard level satisfies the pool performance guideline specified in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants." The NRC review of this evaluation is available in "Oyster Creek Nuclear Generating Station - Staff Assessment of Information Provided Pursuant to Title 10 of the *Code of Federal Regulations* Part 50, Section 50.54(f) Seismic Hazard Reevaluations for Recommendation 2.1 of the Near Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (CAC No. MF5257)," dated February 17, 2016 (ADAMS Accession No. ML15350A353).

Therefore, the plant-specific seismic risk assessment results are acceptable for OCNGS.

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 (IDC) and staff decommissioning assumptions (SDA).[2]

   In accordance with the safety analysis in NUREG-1738, the beyond-design-basis event sequences that dominate risk at a decommissioning power reactor are large earthquake and cask-drop events. This is an important difference relative to an operating power reactor, where typically a large number of different initiating events make significant contributions to risk.

   Assurance that the results of the NUREG-1738 analysis are representative of the plant-specific conditions at OCNGS can be established by assessing the facility against certain design and operational characteristics that were assumed in the NUREG-1738 analysis. These characteristics were identified in the NUREG-1738 study as recovery, mitigation, and emergency response activities assumptions that were relied on to evaluate the likelihood of success in event sequences. In Section 5.5, "Comparison to NUREG-1738 Industry Decommissioning Commitments and Staff Decommissioning Assumptions," and Table 4, "Industry Decommissioning Commitments," of Attachment 1 to the application dated August 22, 2017, the licensee described the conformance of the OCNGS facility and operations with the IDCs and the SDAs. In the licensee's discussion of the IDCs and SDAs, the licensee addressed measures in place to minimize the potential risk from event sequences that dominate risk at a decommissioning reactor with fuel stored in an SFP (for example, those IDCs and SDAs related to fuel cask handling activities and seismic events).

   The 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 SFPs. The following provides a summary of the staff's findings, based on an assessment of the licensee's IDC and SDA items:

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

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

Activity A-36,"dated July 1980 (ADAMS Accession No. ML070250180),] will be implemented).

To provide for safe handling of heavy loads in the vicinity of the SFP, the licensee has maintained equipment and procedures for handling heavy loads that comply with NUREG-0612 guidelines for single-failure-proof handling systems. The cask handling crane (i.e., reactor building bridge crane) trolley was upgraded to a single failure proof design in accordance with NUREG-0612 to provide redundancy in the load carrying path from the cask to the crane trolley itself, so that no single failure would allow the cask to drop. In addition to the trolley replacement, the licensee implemented a comprehensive maintenance program and strict administrative control of all cask handling. The staff found that the qualification and operation of the cask handling crane as a single-failure-proof handling system satisfies the conditions assumed in the analysis presented in NUREG-1738 with respect to protection from potential cask drop events.

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

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

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

The licensee listed and described how various plant procedures would provide for deployment of onsite resources and access to offsite resources, including provisions for training, communications, and coordination to obtain offsite resources. Therefore, the staff concludes the licensee has adequate procedures to satisfy the conditions assumed in the NUREG-1738 analysis regarding effective use of onsite and offsite resources to respond to events affecting the SFP.

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

The licensee described that the SFP instrumentation included instruments, indicators, and alarms for SFP water level, temperature, and radiation levels. There is a continuous temperature monitor that reads out locally without any power. It provides a high-temperature alarm function in the control room (powered by vital direct current (DC)). The temperature gauge is read via dedicated video to the control room. SFP level is monitored by the control room with continuous dedicated video display of surge tank level and surge tank "lo" and "lo-lo" level annunciators. The SFP low-level annunciator in the control room is actuated by a continuous level instrument that senses a level below the surge tank weir height. In addition, there are two channels of continuous remote indication of the SFP water level indicators in the cable spreading room above the control room that have been added for reliable SFP level indication (post-Fukushima). There are two channels of continuous remote indication of refueling floor area radiation in the control room. Each of these channels provide high-area radiation annunciation in the control room. A local alarm to notify personnel of high-area

radiation levels is also in place. In addition, each of these channels provides input to the plant computer. Therefore, the staff found that the licensee will maintain adequate SFP monitoring instrumentation to satisfy the conditions assumed in the NUREG-1738 analysis regarding monitoring events affecting the SFP.

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

The passage between the fuel storage pool and the refueling cavity above the reactor vessel is provided with two double sealed gates with a monitored drain between the gates. This arrangement permits detection of leaks from the passage and repair of the gates in the event of such leakage. 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 top elevation of the fixed refueling slot between the SFP and reactor vessel where the removable refueling slot plug is placed over is at elevation 94 feet (') – 9 inches ("). The top elevation of a spent fuel rack in the SFP is 94'-6". The staff found that the described design features that limit the potential for drainage through the gate openings are consistent with the assumptions used in the analysis presented in NUREG-1738.

IDC #7: Procedures or administrative controls to reduce the likelihood of rapid drain-down 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.

The licensee described procedures and design elements that reduce the likelihood of a rapid drain-down event. The licensee described general work process procedures controlling work to maintain safety. All work activities are subject to the work process controls and integrated risk management where the activities are analyzed and managed for risk. (e.g., address SFP activities). OCNGS Procedure EN-HU-106, "Procedure and Work Instruction Use and Adherence," establishes the expectations and requirements for procedure adherence and usage for all personnel performing activities. Additionally, all work activities are subject to the work process controls and integrated risk management where the activities are analyzed and managed for risk (e.g. address SFP activities). OCNGS Procedure 311, "Fuel Pool Cooling System," allows specified volumes to be pumped or letdown from the SFP. This procedure meets the requirements of this IDC by controlling the suction and discharge points. The staff found that the described procedures or administrative controls, and design features minimize the potential for rapid drainage through permanent systems and are consistent with the assumptions used in the analysis presented in NUREG-1738.

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

The licensee described procedures in place to restore the SFP cooling systems, provide normal makeup to the SFP, and provide an alternate path for makeup water to the SFPs without requiring entry to the refueling floor. The staff found that the planned SFP cooling and make-up water capability conformed to the capabilities assumed for the staff analysis presented in NUREG-1738.

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

The licensee described that procedures govern SFP operations, such as water transfer or independent spent fuel storage installation (ISFSI) activities that could have the potential to rapidly decrease SFP inventory. The licensee stated that all work activities are subject to the work process controls and integrated risk management where the activities are analyzed and managed for risk. Procedures control water inventory during ISFSI operations and ensure the single-failure-proof attributes of the heavy load handling system are maintained. The staff found that the described procedures conformed to the administrative controls considered in the staff analysis presented in NUREG-1738.

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

The licensee described several alternate makeup sources including the OCNGS electric-driven fire pumps and diesel-driven main fire pumps that can supply makeup water to the SFP via the service water system or the fire water system. The OCNGS Fire Protection Program provides controls for operation with equipment out of service and periodic functionality testing. OCNGS also has two diesel-driven engine emergency makeup pumps capable of taking suction from the intake water to satisfy FLEX requirements.

In addition, the licensee stated that procedures contain the licensee's maintenance and testing requirements for equipment designated for strategies to maintain or restore spent fuel cooling. The staff found that the described administrative controls conform to those considered in the 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.

The SFP cooling system design is based, in part, on Regulatory Guide 1.13, "Spent Fuel Storage Facility Design Basis," which included, in part, a Seismic Category I makeup system to add coolant to the SFP. The station's design also includes electric-driven fire pumps and diesel-driven fire pumps; both types 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. Instrumentation was described in the discussion of IDC #5. The staff found the described cooling and makeup capabilities are comparable to the capabilities considered in the staff analysis presented in NUREG-1738.

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

The licensee stated that personnel perform a walk-down of SFP systems once per day. As described later in the response to SDA #3, there are various methods available to the control room for monitoring the SPF, therefore walk-downs may not be as frequent as originally describe in NUREG-1738. Procedures provide the necessary guidance to address loss of SFP cooling and loss-of-level conditions. The staff found that the proposed monitoring of the SFP systems would be comparable to the capability assumed for the staff analysis presented in NUREG-1738.

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

The licensee described that control room SFP temperature instrumentation includes a continuous temperature monitor that reads out locally without any power. It provides a high temperature alarm function in the control room (powered by vital DC). The temperature gauge is read via dedicated video to the control room. SFP level is monitored by the control room with continuous dedicated video display of surge tank level and surge tank “lo” and “lo-lo” level annunciators. The SFP “lo level” annunciator in the control room is actuated by a continuous level instrument that senses a level below the surge tank weir height. Additionally, there are two channels of continuous remote indication of the SFP water level indicators in the cable spreading room above the control room that have been added for reliable SFP level indication (post-Fukushima). The staff finds that the SFP monitoring capability is consistent with the assumptions in the analysis presented in NUREG-1738.

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

The licensee described potential drain or siphon paths within the SFP. Neither of the normal SFP cooling suction and discharge paths within the SFP could lower pool level more than 15 feet below the normal operating level. The normal SFP cooling system suction lines are from weir feed surge tanks. Weir lip is at 118’–2”, which is approximately 24 feet above the top of active fuel. The return line is protected from siphoning by check valves and passive vacuum break holes. This is seismically rated piping. The SFP lowest drain path is via the 3-inch drain line located between the inboard and outboard SFP gates, located at elevation 94’-6”, which is located approximately 24 feet below normal SFP water level. Drain-down to this elevation, which is 3 inches above the top of the spent fuel racks, prevents uncovering of fuel. However, this path requires a gross failure of the inboard gate sealing gasket as well as failure of the 3-inch drain line. As discuss previously in IDC #6, the passage between the fuel storage pool and the refueling cavity above the reactor vessel is provided with two double sealed gates with a monitored drain between the gates. This arrangement

permits detection of leaks from the passage and repair of the gates in the event of such leakage. 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. Therefore, the SFP design reasonably protects against drainage that results in fuel uncovery consistent with the assumptions used in the analysis presented in NUREG-1738. As discussed previously in IDC #4, the licensee listed and described how various plant procedures would provide for deployment of onsite resources and access to offsite resources, including provisions for training, communications, and coordination to obtain offsite resources

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.

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

SDA #6: Each decommissioning plant will successfully complete the seismic checklist provided in Appendix 2B to 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).

The licensee completed a seismic evaluation in response to an NRC request for information pursuant to the requirements of 10 CFR 50.54(f) regarding recommendation 2.1, "Seismic," of the NRC's Near-Term Task Force Review of insights from the Fukushima Dai-ichi accident. The seismic evaluation was performed consistent with NRC guidance and determined that the SFP value for high-confidence of low-probability of failure for the once per 100,000 year hazard level satisfies the pool performance guideline specified in NUREG-1738. The NRC's review of this evaluation is available in "Oyster Creek Nuclear Generating Station – Staff Assessment of Information Provided Pursuant To Title 10 of the *Code of Federal Regulations* Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (CAC NO. MF5257)," dated February 17, 2016 (ADAMS Accession No. ML15350A353). Therefore, the plant-specific seismic risk assessment results are acceptable for OCNGS.

Additionally, Section 5.6, "Consequences of a Beyond Design-Basis Earthquake," of Attachment 1 to the application compares OGNGS spent fuel storage characteristics with those of the reference plant evaluated by the staff in NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," dated September 2014 (ADAMS Accession No. ML14255A365). However, the comparison does not address the distribution of recently discharged fuel (an important parameter used in the NUREG-2161 evaluation) that will exist once the OCNGS reactor is permanently defueled. The staff issued a request for additional information (RAI), RAI-OCNGS-10, requesting the licensee to describe the

fuel distribution that will exist at the time the emergency plan changes that would be permitted by the requested exemption, are scheduled for implementation.

In response to a staff RAI, the licensee clarified that the fuel will be thermally dispersed at the time the emergency plan changes permitted by this exemption are implemented. The fuel that is removed from the reactor on final shutdown is considered the "hottest" fuel and will have decayed for 1 year at the time that this exemption commences. The "hottest" fuel bundles will be dispersed in a pattern where cooler fuel (removed from the reactor for at least 4 years) with less decay heat will surround the hottest bundles. Storing spent fuel in a dispersed pattern in a SFP promotes air coolability of the spent fuel in the unlikely event of loss of water. The licensee further stated that the fuel distribution in the SFP will be bounded by that assumed in NUREG-2161 because OCNGS fuel is from a lower powered reactor and there will be fewer total fuel bundles in the SFP than present in the reference plant SFP described in NUREG-2161.

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

The OCNGS has high density spent fuel racks that utilize two types of neutron poison: 10 Boraflex racks and 4 Boral racks of similar design. As described in Section 9.1.2.3.9.1 of the OCNGS UFSAR, an aging management program is in place to manage loss of material and reduction of neutron absorption capacity of Boraflex neutron absorption panels in the spent fuel racks. The loss of material and the reduction of the neutron-absorbing capacity will be determined through in-situ testing and NRC-accepted RACKLIFE modeling. Boral performance is assessed by the surveillance program that utilizes test coupons.

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

6. Verification that the licensee presents a determination that there are sufficient resources and adequately trained personnel available on-shift to promptly initiate mitigative actions within the 10-hour minimum time period that will prevent an offsite radiological release that exceeds the EPA early phase PAGs at the EAB.

   The OCNGS mitigative strategies are maintained in accordance with License Condition 2.C.(8) of the OCNGS Renewed Facility Operating License. Specific to the implementation of NEI 06-12, "B.5.b Phase 2 and 3 Submittal Guideline, Revision 2, December 2006" (ADAMS Accession Number ML070090060), Table A.2-2 "SFP Makeup – External Strategy," can be performed by the proposed onshift staffing of a Non-Certified Operator (NCO), Shift Manager (SM) and Radiation Protection Technician (RPT) required to support mitigating strategies for a catastrophic loss of spent fuel pool (SFP) water inventory. While the SM will be responsible for directing the mitigating strategies, in addition to his emergency preparedness tasks, the NCO and RPT would not have any concurrent emergency preparedness tasks during performance of mitigating strategies. The in-plant team performing SFP mitigating strategies would have normal shift electronic dosimetry, monitoring, and radiation protection controls that exist for in-plant shift workers. This would alleviate any concurrent tasks that the RPT

would need to perform while performing mitigating strategies.. The ability to perform the required actions within the specified time is documented and retained at the station for review. The systematic approach to training is implemented to ensure operations and other appropriate personnel receive initial and continuing training on B.5.b event-related procedures and strategies credited in the Mitigation Strategy License Condition.

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

   OCNGS maintains procedures and strategies for the movement of any necessary portable equipment that will be relied upon for mitigating the loss of SFP water. These mitigative strategies were developed in response to 10 CFR 50.54(hh)(2) and are maintained in accordance with License Condition 2.C.(8) of the OCNGS Renewed Facility Operating License. These diverse strategies provide defense-in-depth and ample time to provide makeup water or spray to the SFP prior to the onset of zirconium cladding ignition when considering very low probability beyond-design-basis events affecting the SFP.

In addition to an evaluation against the specific NSIR/DPR-ISG-02 criteria above, Table 1 provides the staff's evaluation of the specific exemptions requested to the requirements of 10 CFR 50.47 and Appendix E to Part 50, based on the justification provided by the licensee 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:
Staff's Evaluation: The NRC requires a level of licensee emergency preparedness (EP) commensurate with the potential consequences to public health and safety, and common defense and security at the licensee's site. Exelon's exemption request included radiological analyses to show that, as of 33 days after the final reactor shutdown, the radiological consequences of design-basis-accidents would not exceed the limits of the EPA early phase PAGs at the EAB. The licensee also concluded and the staff confirmed, as of 365 days (1 year) after the final reactor shutdown, 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 before the hottest fuel assembly reached 900˚C to take mitigative actions. NUREG-1738, and enhancements put into place as a result of the events of September 11, 2001, and Fukushima Dai-ichi, support staff assumptions that: only a highly unlikely, beyond-design-basis event (e.g., extreme earthquake or large aircraft impact) could result in an SFP fire. In addition, there would be a significant amount of time between the initiating event and the possible onset of conditions that could result in an SFP 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 a comprehensive emergency management plan 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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not necessary for a permanently shut down and defueled nuclear power reactor.
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.
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

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the environs of nuclear facilities in the event of a serious power reactor accident. As previously discussed, Exelon has provided radiological analyses, which show that, as of 365 days (1 year) after the final reactor shutdown, the radiological consequences for design-basis accidents at OCNGS 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 shut down and defueled power reactor. Considering the very low probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, offsite REP plans are not needed. 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.
Staff's Evaluation: With the termination of reactor power operations at OCNGS 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 system will no longer be 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 will no longer be 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 with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, an EOF would not be needed to coordinate these types of assessments for determining public protective actions. Onsite operations staff will continue to maintain and provide for communication and coordination capabilities with offsite authorities and OROs for the purpose of notification and for the level of support required for remaining design-basis accidents and the prompt implementation of mitigative actions in response to an SFP accident.
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~~

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~~information provided by facility licensees for determinations of minimum initial offsite response measures~~.
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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for minimum initial offsite response measures is not required.
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~~.
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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, a means to provide early notification and clear instruction to the populace within a designated plume exposure 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~~.
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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to provide prompt communication to the public within a designated plume exposure EPZ in regards 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.

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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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to provide periodic information to the public within a designated plume exposure 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.
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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for 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.~~
Staff's Evaluation: The staff has determined that no credible events within the design basis would result in doses to the public that would exceed the EPA early phase PAGs at the EAB. Therefore, EPZs beyond the EAB and the associated protective actions developed from evacuation time estimates are no longer required. Additionally, in the unlikely event of an SFP accident, the iodine isotopes, which contribute to an off-site dose from an operating reactor power accident, are not present, so KI distribution would no longer serve as an effective or necessary supplemental protective action. As such, the staff concludes that Exelon provides for an acceptable level of EP at OCNGS 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 OCNGS. Although formal offsite REP plans (in accordance with 44 CFR Part 350) have typically been exempted for decommissioning sites, OROs will continue to be relied upon for firefighting, law enforcement, ambulance, and medical services in support of the licensee's (onsite) emergency plan. The licensee is responsible for providing protective measures for any emergency workers responding onsite. Additionally, the licensee is responsible for control of activities within the EAB, including public access. The licensee actions that are necessary to protect the health and safety of members of the public who are in the EAB may include,

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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.~~
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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for an EPZ is not required. Paragraph 50.47(c)(2) and footnote 1 to Appendix E to 10 CFR Part 50 both state: "The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW [megawatt] thermal." This is not applicable to OCNGS and, therefore, requires no exemption.
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.
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" (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. Exelon has certified that it will permanently cease operations at OCNGS and that all fuel will be removed from the reactor vessel. Therefore, the enhancements for hostile actions, as required by the 2011 EP Final Rule, are not necessary for OCNGS in a permanently shut down and defueled status.

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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 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 OCNGS 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.~~
Staff's Evaluation: Refer to basis for 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.~~
Staff's Evaluation: Refer to basis for 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.~~
Staff's Evaluation: Refer to basis for 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 between decennial censuses and shall submit these estimates to the NRC with any updated ETE analysis.~~
Staff's Evaluation: Refer to basis for 10 CFR Part 50, Appendix E, Section IV.2.

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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.~~
Staff's Evaluation: Refer to basis for 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: Upon docketing of the certifications of permanent ceasing of operations and permanent removal of fuel from the reactor vessel, the 10 CFR Part 50 license for OCNGS will no longer authorize operation of the OCNGS reactor, or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Because the licensee will no longer be authorized to operate the reactor, the licensee will not have a plant "operating" organization. A description of the plant organization, as it relates to the requirements in 10 CFR Part 50, Appendix E, Section IV.A.1, 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.~~
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. Exelon 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 will be trained to implement such strategies with equipment maintained onsite. OCNGS 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.
Staff's Evaluation: The licensee's analysis demonstrated that, as of 33 days after the final reactor shutdown, no design-basis accidents 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-design-basis accident would result in doses in excess of the EPA early phase PAGs to the public beyond the EAB,

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the licensee still must be able to determine if a radiological release is occurring, thereby achieving the underlying purpose of the rule. If a release is occurring, then the licensee's staff 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. Considering the very low-probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for offsite dose projections is 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.~~
Staff's Evaluation: Exelon 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. Exelon 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 with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement for personnel with special qualifications, as directed in 10 CFR Part 50, Appendix E, Section IV.A.5, is not required.
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.
Staff's Evaluation: Refer to basis for 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.~~

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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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, identification of the State and/or local officials responsible for detailed pre-planning for, 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.~~
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 OCNGS and non-power reactors show that the OCNGS 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.
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, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated zirconium cladding fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, a decommissioning reactor is not required to have EALs to determine protective measures offsite. With respect to EALs for hostile action, refer to basis for 10 CFR Part 50, Appendix E, Section IV.1.
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

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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.
Staff's Evaluation: Containment and emergency core cooling system parameters no longer provide an indication of a potential emergency for a permanently shut down and defueled power reactor, and emergency core cooling systems are no longer required. Other indications, such as SFP level, SFP temperature, and area radiation monitors indicate the conditions at OCNGS. The licensee's analysis demonstrates that no design-basis accident 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-design-basis accident condition that could reach emergency classifications of a Site Area Emergency or a General Emergency is very low. In the unlikely event of a severe beyond-design-basis accident resulting in the loss of all cooling to the stored fuel, as of 365 days (1 year) after the final reactor shutdown, it would take 10 hours from the time the fuel is uncovered until it reaches a temperature of 900˚C. During this time, the licensee could initiate mitigative actions consistent with plant conditions. Considering the very low probability of beyond-design-basis events occurring that would affect SFP structural integrity, as well as the time available to initiate SFP mitigative measures before the onset of a postulated zirconium cladding fire, the need for offsite radiation monitoring systems in support of event classification above an Alert classification level is no longer required.
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.

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Staff's Evaluation: 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 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~~.
Staff's Evaluation: Refer to basis for 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.~~
Staff's Evaluation: Refer to basis for 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~~

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~~means for a backup method of public alerting and notification capable of being used in the event the primary method of alerting and notification is unavailable during an emergency to alert or notify all or portions of the plume exposure pathway EPZ population. The backup method shall have the capability to alert and notify the public within the plume exposure pathway EPZ, but does not need to meet the 15 minute design objective for the primary prompt public alert and notification system. When there is a decision to activate the alert and notification system, the appropriate governmental authorities will determine whether to activate the entire alert and notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public alert and notification system shall remain with the appropriate governmental authorities.~~
Staff's Evaluation: Exelon proposes in its exemption requests to complete emergency notifications to the State of New Jersey within 60 minutes after an emergency declaration or a change in classification. Although Exelon is a general licensed ISFSI and the emergency plan is based on 10 CFR Part 50, the staff also considered the requirements in 10 CFR 72.32(a) to ensure consistency between general and specific licensed ISFSIs. The 60-minute notification timeliness is consistent with the notification time requirements for emergency plans based on the requirements in 10 CFR 72.32. Information will be disseminated to the public and media in accordance with State and local plans. Also refer to basis for 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.~~
Staff's Evaluation: Refer to the basis for 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;
Staff's Evaluation: The Technical Support Center (TSC) is an area located close to the control room that shall provide plant management and technical support to the reactor operating personnel located in the control room during emergency conditions. It shall have 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 shall be the primary communications center for the plant during an emergency. With the permanently shutdown and defueled status of the OCNGS reactor and the storage of the spent nuclear fuel in the SFP and the ISFSI, a TSC and EOF will no longer be required to meet

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its original purpose during an emergency, nor to support initial SFP mitigation actions if needed. Also see the basis for 10 CFR 50.47(b)(3).

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

Staff's Evaluation: The 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 OCNGS reactor and the storage of the spent nuclear fuel in the SFP and the ISFSI, an OSC will no longer be required to meet its original purpose during an emergency, nor to support initial SFP mitigation actions if needed.

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;~~

Staff's Evaluation: Refer to basis for 10 CFR 50.47(b)(3).

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~~

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~~licensee and offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves; and~~ (3) ~~The capability to support response to events occurring simultaneously at more than one nuclear power reactor site if the emergency operations facility serves more than one site; and~~
Staff's Evaluation: Refer to basis for 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.~~
Staff's Evaluation: Refer to basis for 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;~~
Staff's Evaluation: Refer to basis for 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.
Staff's Evaluation: OCNGS will maintain communications with the State of New Jersey and the NRC. Refer to basis for 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.~~
Staff's Evaluation: Considering the very low-probability of beyond-design-basis accidents affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. There is no need for a TSC, EOF, or offsite field assessment teams to meet the underlying purpose of the rule. With

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the elimination of the requirements for a TSC, EOF and the field assessment teams, the requirements to perform annual testing is no longer required. Communications with State and local governments will continue to be tested monthly under 10 CFR Part 50, Appendix E, Section IV.E.9.a.

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.

Staff's Evaluation: Based on the smaller facility staff and the greatly reduced required interaction with State and local emergency response facilities, the 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. Communications with NRC Headquarters and the appropriate NRC Regional Office Operations Centers will be conducted from one or more locations and 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~~.

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 staff considers exempting licensee's

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headquarters personnel from training requirements to be reasonable. Due to the low probability of design-basis-accidents 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; references to this term in the examples provided in the regulation are, therefore, 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.
Staff's Evaluation: Refer to basis for 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.]
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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to conduct a full participation exercise with State and local agencies is not required. The licensee would be exempt from 10 CFR Part 50, Appendix E, Paragraph 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 capabilities. The principal functional areas of emergency response include activities such as management and

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coordination of emergency response, accident assessment, event classification, notification of offsite authorities, and assessment of the onsite ~~and offsite~~ impact of radiological releases, ~~protective action recommendation development, protective action decision making, plant~~ system repair and mitigative action implementation. During these drills, activation of all of the licensee's emergency response facilities ~~(Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF))~~ would not be necessary, licensees would have the opportunity to consider accident management strategies, supervised instruction would be permitted, operating staff in all participating facilities would have the opportunity to resolve problems (success paths) rather than have controllers intervene, and the drills may focus on the onsite exercise training objectives.
Staff's Evaluation: Refer to basis for 10 CFR Part 50, Appendix E, Section IV.F.2.a.
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.~~
Staff's Evaluation: Refer to basis for 10 CFR Part 50, Appendix E, Section IV.F.2.a.

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10 CFR Part 50, Appendix E, Section IV.F.2.d: ~~Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in the ingestion pathway portion of exercises at least once every exercise cycle. In States with more than one nuclear power reactor plume exposure pathway EPZ, the State should rotate this participation from site to site. Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in a hostile action exercise at least once every cycle and should fully participate in one hostile action exercise by December 31, 2015. States with more than one nuclear power reactor plume exposure pathway EPZ should rotate this participation from site to site.~~
Staff's Evaluation: Refer to basis for 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.
Staff's Evaluation: Refer to basis for 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.~~
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, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, the requirement to conduct a full participation exercise with State and local agencies is not needed. Since the 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.
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 the rule. Considering the very low probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the

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spent fuel, and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, 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 eight calendar year exercise cycle, nuclear power reactor licensees shall vary the content of scenarios during exercises conducted under paragraph 2 of this section to provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to respond to the following scenario elements: hostile action directed at the plant site, no radiological release or an unplanned minimal radiological release that does not require public protective actions, an initial classification of or rapid escalation to a Site Area Emergency or General Emergency, implementation of strategies, procedures, and guidance developed under § 50.54(hh)(2), and integration of offsite resources with onsite~~ justification~~. The licensee shall maintain a record of exercises conducted during each eight year exercise cycle that documents the content of scenarios used to comply with the requirements of this paragraph. Each licensee shall conduct a hostile action exercise for each of its sites no later than December 31, 2015. The first eight-year exercise cycle for a site will begin in the calendar year in which the first hostile action exercise is conducted. For a site licensed under Part 52, the first eight-year exercise cycle begins in the calendar year of the initial exercise required by Section IV.F.2.a.~~
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 the rule. Considering the very low-probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions, between the loss of both water and air cooling to the spent fuel, and before the onset of a postulated fire, formal offsite REP plans (in accordance with 44 CFR Part 350) are not needed. Therefore, 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.~~
Staff's Evaluation: Refer to basis for 10 CFR Part 50, Appendix E, Section IV.E.8.d.