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

October 17, 2018

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION - ISSUANCE OF AMENDMENT RE: CHANGES TO THE EMERGENCY PLAN FOR PERMANENTLY DEFUELED EMERGENCY PLAN AND EMERGENCY ACTION LEVEL SCHEME (CAC NO. MG0160; EPID L-2017-LLA-0307)

Dear Mr. Hanson:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 294 to Renewed Facility Operating License No. DPR-16 for the Oyster Creek Nuclear Generating Station, in response to your application dated August 29, 2017, as supplemented by letter dated February 13, 2018.

The amendment revises the site emergency plan and emergency action level scheme for the permanently defueled condition.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

John G. Lamb, Senior Project Manager
Special Projects and Process Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosures:
1. Amendment No. 294 to Renewed DPR-16
2. Safety Evaluation

cc: Listserv

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

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-219

OYSTER CREEK NUCLEAR GENERATING STATION

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 294
Renewed License No. DPR-16

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee), dated August 29, 2017, as supplemented by letter dated February 13, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 294, Renewed Facility Operating License No. DPR-16 is hereby amended to authorize the revision to the Oyster Creek Nuclear Generating Station Emergency Plan and Emergency Action Level Scheme as set forth in Exelon Generation Company, LLC's application dated August 29, 2017, as supplemented by letter dated February 13, 2018, and as evaluated in the NRC staff's safety evaluation issued with this amendment.

3. This license amendment is effective 12 months (365 days) following the permanent cessation of power operations and shall be implemented within 60 days of the effective date, but no later than March 28, 2021.

FOR THE NUCLEAR REGULATORY COMMISSION

Michele G Evans for

Ho K. Nieh, Director
Office of Nuclear Reactor Regulation

Date of Issuance: October 17, 2018

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 294

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-16

EXELON GENERATION COMPANY, LLC

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NO. 50-219

1.0 INTRODUCTION

By application dated August 29, 2017 (Reference 1), as supplemented by letter dated February 13, 2018 (Reference 2), Exelon Generation Company, LLC (Exelon or the licensee) requested changes to the site emergency plan and emergency action level (EAL) scheme for the permanently defueled condition for the Oyster Creek Nuclear Generating Station (Oyster Creek).

The supplemental letter dated February 13, 2018, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on October 24, 2017 (82 FR 49238).

The proposed amendment would revise the Oyster Creek Emergency Plan, referred to hereafter as the Permanently Defueled Emergency Plan (PDEP), and the Oyster Creek EAL scheme, based on the NRC staff's approval of the proposed exemptions. The licensee's letter dated August 29, 2017, contained a copy of the proposed PDEP and EAL scheme, including a description and evaluation of the proposed changes and a comparison to the EAL scheme provided in Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012 (Reference 3).

By letter dated August 22, 2017 (Reference 4), and as supplemented by letters dated December 6, 2017, and January 23, March 8, and March 19, 2018 (References 5, 6, 7, and 8, respectively), Exelon requested a license exemption from specific emergency planning (EP) requirements contained in Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.47, "Emergency plans," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, based on the permanently shutdown and defueled condition of the Oyster Creek reactor. The requested exemptions were granted and will be implemented no earlier than 12 months (365 days) after permanent cessation of power operations.

2.0 BACKGROUND

Oyster Creek is a power reactor located near the Atlantic Ocean within the State of New Jersey. The facility site, approximately 152 acres, is in Lacey and Ocean Townships, Ocean County. The Oyster Creek site is about 2 miles inland from the shore of Barnegat Bay and 7 miles west northwest of Barnegat Light on the Atlantic shorefront. The site is approximately 9 miles south of Toms River, New Jersey, about 50 miles east of Philadelphia, Pennsylvania, and 60 miles south of Newark, New Jersey.

Exelon is the holder of the Renewed Facility Operating License (RFOL) No. DPR-16, issued pursuant to the Atomic Energy Act of 1954, as amended, and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," authorizing the licensee to possess and store spent nuclear fuel and greater-than-Class C radioactive waste at the Oyster Creek facility.

By letter dated January 7, 2011 (Reference 9), pursuant to 10 CFR 50.82(a)(1)(i), Exelon certified to the NRC that it planned to permanently cease operations at Oyster Creek by December 31, 2019.

By letter dated February 14, 2018 (Reference 10), Exelon subsequently notified the NRC of its plans to permanently cease operations at Oyster Creek no later than October 31, 2018.

On September 17, 2018 (Reference 19), Exelon permanently ceased power operations at Oyster Creek.

By letter dated September 25, 2018 (Reference 20), Exelon certified that all the fuel was permanently removed the Oyster Creek reactor vessel.

Upon the docketing of the certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for Oyster Creek no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel. Spent fuel will be stored on-site in the Oyster Creek spent fuel pool (SFP) and a dry cask independent spent fuel storage installation (ISFSI) at the Oyster Creek facility.

The licensee submitted the proposed Oyster Creek PDEP to the NRC in accordance with 10 CFR 50.54(q)(4), contingent on the NRC's prior approval of certain exemptions from specific requirements of 10 CFR 50.47 and Appendix E to 10 CFR Part 50.

By letter dated October 16, 2018 (Reference 11), the NRC staff granted Exelon exemptions from certain EP requirements in 10 CFR 50.47 and Appendix E to 10 CFR Part 50, in accordance with 10 CFR 50.12, "Specific exemptions," and based, in part, on the low risks associated with the Oyster Creek reactor in a permanently shutdown and in the defueled condition. In granting the requested exemptions, the NRC primarily relied on the Oyster Creek site-specific analyses, which provided reasonable assurance that: (1) an offsite radiological release would not exceed the U.S. Environmental Protection Agency (EPA) early phase protective action guides (PAGs) (Reference 12) at the site's exclusion area boundary (EAB) for the remaining design-basis accidents applicable to the Oyster Creek facility in its permanently shutdown and defueled condition; and (2) in the highly unlikely event of a severe beyond-design-basis accident resulting in a loss of all cooling to the spent fuel stored in the Oyster Creek SFP, there would be a significant amount of time between the initiating event and the possible onset of conditions that could result in a zirconium cladding fire. This time provides

a substantial opportunity for event mitigation. Oyster Creek is 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 the offsite response organizations (OROs) to implement these measures using a comprehensive, or "all-hazards," emergency management plan (CEMP) approach.[1]

The Commission's approval of the requested exemptions is documented in a Staff Requirements Memorandum dated July 17, 2018 (Reference 14), responding to SECY-18-0062, "Request by the Exelon Generation Company, LLC for Exemptions from Certain Emergency Planning Requirements for the Oyster creek Nuclear Generating Station," dated May 31, 2018 (Reference 15). With the NRC's approval of the requested EP exemptions, Exelon stated that the proposed Oyster Creek PDEP will continue to meet the remaining applicable planning standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50.

In addition to the proposed changes in the PDEP, Exelon is proposing to change the entire EAL scheme to reflect the permanently shutdown and defueled condition of the Oyster Creek reactor. In accordance with Section IV.B.2 of Appendix E to 10 CFR Part 50, the licensee must receive NRC approval before implementing a change to the entire EAL scheme. The licensee stated that the changes to the EAL scheme are consistent with the methodology recommended for permanently shutdown and defueled reactors, as provided in NEI 99-01, Revision 6.

3.0 REGULATORY EVALUATION

3.1 Emergency Plan

Section 50.47 of 10 CFR sets forth the emergency plan requirements for nuclear power reactors. The regulation in 10 CFR 50.47(a)(1)(i) states, in part, that:

> no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Section 50.47(b) of the Commission's regulations establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency.

Appendix E, Section IV, "Content of Emergency Plans," to 10 CFR Part 50 provides the requirements for the content of the emergency plans.

The EP regulations contained in 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50, apply to both operating power reactors, and permanently shutdown and defueled power reactors. However, the EP regulations are silent with regard to the fact that once a power reactor permanently ceases operation and permanently removes fuel from the reactor vessel, the risks of credible emergency accident scenarios at the facility are greatly reduced. Therefore, the

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[1] A CEMP in this context, also referred to as an emergency operations plan, is addressed in the Federal Emergency Management Agency (FEMA) Comprehensive Preparedness Guide 101, "Developing and Maintaining Emergency Operations Plans," Version 2.0, dated November 2010 (Reference 13).

consistent practice for permanently shutdown and defueled power reactors has been for the licensees to request exemptions under 10 CFR 50.12, which allow changes to the facility's emergency plan, commensurate with the credible site-specific risks that are present during decommissioning. Such EP exemptions generally recognize the reduction in radiological risk as spent fuel ages and the preclusion of accidents that are strictly applicable to an operating nuclear power reactor.

The practice of granting exemptions from the Commission's EP regulations is a well-established part of the NRC regulatory process. This process allows licensees to address site-specific situations or to implement alternative approaches in response to circumstances that are not necessarily contemplated in regulations that are generally intended for operating power reactors. The exemption process, which allows the NRC to provide relief in appropriate circumstances where safety and security continue to be assured, is not unique to the decommissioning of power reactors or to the specific technical areas of EP. The Commission makes decisions on exemption requests on a site-specific, case-by-case basis, following an established process that includes the NRC staff's detailed technical assessment on individual exemption requests. According to 10 CFR 50.12, the Commission may grant exemptions from the requirements of its regulations, which are authorized by law, will not present an undue risk to the public health and safety, are consistent with the common defense and security, and present special circumstances.

The guidance in Revision 1 to NUREG-0654/FEMA-REP-1 (NUREG-0654), "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980 (Reference 16), provides an acceptable method for power reactor licensees to develop radiological emergency response plans. The NUREG-0654 provides guidance for the format and content of an emergency plan, which can be applied to the planning standards in 10 CFR 50.47(b). Attachment 1, "Staff Guidance for Evaluation of Permanently Defueled Emergency Plans," to Interim Staff Guidance (ISG) document NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," dated May 11, 2015 (Reference 17), provides an acceptable method for the NRC staff's review of PDEPs for sites undergoing decommissioning and was developed from the remaining applicable evaluation criteria in Section II to NUREG-0654.

3.2 Emergency Action Level Scheme

Paragraph 50.47(b)(4) of 10 CFR, as exempted for Oyster Creek (exempted language indicated by strikeout and bolded text), requires that a licensee's emergency response plan contain:

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

This requirement emphasizes a standard emergency classification and action level scheme, assuring that implementation methods are relatively consistent throughout the industry for a given reactor and containment design, while simultaneously providing an opportunity for a licensee to modify its EAL scheme as necessary to address plant-specific design considerations or preferences.

Section IV.B of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek (exempted language indicated by strikeout and bolded text), states:

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.

2. A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. Licensees shall follow the change process in § 50.54(q) for all other emergency action level changes.

The NRC staff's review is based upon a revision to the Oyster Creek EAL scheme provided in the licensee's letter dated August 29, 2017. As part of this review, the NRC staff assessed the site-specific modifications made by Oyster Creek to the guidance provided by NEI 99-01, Revision 6. The NRC endorsed this methodology by letter dated March 28, 2013 (Reference 18), as an acceptable method for developing EALs required by 10 CFR 50.47(b)(4), Section IV.B.1 of Appendix E to 10 CFR Part 50, and the associated planning standard evaluation criteria in Section II.D of NUREG-0654. In addition, the methodology also provides guidance for permanently shutdown and defueled power reactors for the development of a site-specific emergency classification scheme.

4.0 TECHNICAL EVALUATION

4.1 Emergency Plan

Upon the docketing of the certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for Oyster Creek will no longer authorize operation of the reactor or emplacement or retention of fuel into the reactor vessel. On September 25, 2018, Exelon completed docketing the certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel. Consequently, the Oyster Creek PDEP describes the licensee's response to emergencies that may arise at Oyster Creek while it is in a permanently shutdown and defueled configuration. Recognizing that there are no longer any credible design-basis accidents that would result in offsite dose consequences large enough to require offsite radiological emergency preparedness (REP) plans in accordance with 44 CFR Part 350, the PDEP no

longer specifies the requirements for formal offsite REP planning. Additionally, the onsite EP activities contained in the Oyster Creek PDEP are reduced in scope. The PDEP specifically implements the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted by the NRC's letter to Exelon dated October 16, 2018.

This safety evaluation summarizes the NRC staff's technical evaluation of the Oyster Creek PDEP, based on the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, and using the remaining applicable evaluation criteria provided in NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-002. The proposed changes, as exempted for Oyster Creek, are shown with a strikethrough of the current wording associated with the regulations.

4.1.1 Assignment of Responsibility (Organizational Control)

Paragraph 50.47(b)(1) of 10 CFR, as exempted for Oyster Creek, requires in a licensee's emergency plan that:

> 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.

The Shift Manager position is staffed 24 hours a day, 7 days a week. This position is the senior management position at the facility during off-hours and is responsible for monitoring facility conditions and approving onsite activities. The position has the authority, management ability, and technical knowledge to classify and declare an emergency event, and shall assume the position of Emergency Director once the emergency classification has been declared. This position is responsible for monitoring conditions, approving all onsite activities, and has the requisite authority, management ability, technical knowledge, and staff to manage the site emergency and recovery organization.

In addition to the Shift Manager, designated on-shift staff positions include a Non-Certified Operator and Radiation Protection (RP) Technician, along with security personnel. The Oyster Creek Emergency Response Organization (ERO) is activated at the Alert classification, and will augment the on-shift staff within approximately 2 hours of the declaration of an Alert emergency classification level (ECL). However, the ERO may be activated, in part or in whole, at any time at the discretion of the Shift Manager/Emergency Director. The on-shift staff can perform all required response actions, including initiation of SFP mitigation measures, until the ERO arrives.

The OROs that may respond to a declared emergency at Oyster Creek are listed below. The details of their responsibilities are described in Section 7.0, "Organization," of the Oyster Creek PDEP. Evidence of agreements with participating local services is listed in Appendix 4, "List of Letters of Agreement," of the Oyster Creek PDEP.

Medical Support Organizations and Personnel

- Community Medical Center
- Southern Ocean Medical Center
- Lacey Township First Aid Squad

- Lanoka Harbor First Aid Squad
- Waretown First Aid Squad

Firefighting Organizations

- Lanoka Harbor Fire Department
- Forked River Volunteer Fire Company
- Bayville Fire Department

Note: These are supplemented by Mutual Aid agreements with other firefighting organizations.

Law Enforcement Agencies

- New Jersey State Police
- Lacey Township Police Department

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately describes the concept of operations for individuals and organizations responsible for responding to emergencies at the site; identifies the position of Shift Manager/Emergency Director as the individual in charge of the emergency response, and identifies the minimum staff on duty at the plant during all shifts to provide emergency response. Additional personnel are available on an on-call basis to respond to plant emergencies. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(1), and the requirements of Sections IV.A.1, A.2, A.4, and A.7 of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to assignment of responsibility (organization control), are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.2 Onsite Emergency Organization

Paragraph 50.47(b)(2) of 10 CFR requires that a licensee's emergency response plan contain:

> On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.

The Oyster Creek facility has designated personnel on-shift at all times, including a designated Shift Manager, Non-Certified Operator, and RP Technician, who would provide the initial response to an event. The Shift Manager is the on-shift individual who declares the initial emergency classification and assumes the role of Emergency Director. The Shift Manager has the authority to immediately and unilaterally initiate any emergency actions. The PDEP also specifies the non-delegable and delegable responsibilities of the Emergency Director.

Members of the on-shift organization are trained on their responsibilities and duties in the event of an emergency and are capable of performing necessary response actions until the ERO arrives to augment on-shift staffing or the event is terminated. The on-shift staffing assignments

include the roles and responsibilities for their emergency response functions. The relationship between normal and emergency response positions for the shift personnel is unchanged when an event occurs.

The Oyster Creek ERO augments the on-shift station organization's ability to respond to declared emergencies. Personnel are trained and assigned to the ERO based on either their normal job qualifications or by being specifically trained to fill a position. The ERO is activated at the declaration of an Alert, or in part or in whole, at any time at the discretion of the Shift Manager. Upon declaration of an ECL, the Shift Manager assumes the responsibilities of the Emergency Director position, which is responsible for ensuring that an ERO callout method is initiated to augment the on-shift staff. The minimum augmented staff is an RP Coordinator and a Technical Coordinator. The on-shift positions, and the augmented positions that fulfill emergency staffing capabilities, are depicted in Table 7.1, "Minimum On-Shift and ERO Staffing Requirements," of the Oyster Creek PDEP. This table, along with Figure 7.1, "Normal On-Shift and Emergency Response Organization," provides a graphical representation of the functional responsibilities for designated on-shift positions and the augmented positions that fulfill emergency staffing capabilities.

The Oyster Creek PDEP further provides that in the event of an emergency at Oyster Creek requiring additional personnel and other support resources, the Oyster Creek ERO can be augmented with manpower and equipment support from OROs, as previously discussed in Section 3.1.1 of this safety evaluation. Arrangements are in place through letters of agreement for ambulance services, treatment of contaminated and injured patients, fire support services, and law enforcement response, as requested by Oyster Creek.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP identifies: (1) the onsite ERO and its relationship to the normal shift complement; (2) that the on-shift individual responsible for emergency response is the Shift Manager, who has the authority and responsibility to initiate the functional responsibilities for emergency response; (3) adequate staffing to provide initial facility accident response in key functional areas; (4) that timely augmentation of response capabilities is available; (5) that local services are identified with letters of agreement in place; and (6) arrangements for the treatment and transportation of contaminated injured personnel. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(2), and the requirements of Sections IV.A.1, A.2, A.4, A.9, and C.1 of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to the onsite emergency organization, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.3 Emergency Response Support and Resources

Paragraph 50.47(b)(3) of 10 CFR, as exempted for Oyster Creek, requires that a licensee's emergency response plan contain:

> 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.

The Emergency Director is authorized to request assistance as needed, including fire, ambulance, and local law enforcement response. Letters of agreement are in place for those local agencies that will respond to the site and for the local hospitals that may be required to treat a contaminated injured individual from the site, as designated in the Oyster Creek PDEP. These letters of agreement are discussed in Section 4.1.1 of this safety evaluation.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately describes the arrangements for requesting assistance from other organizations or individuals in an emergency, and that this assistance is supported by letters of agreement. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(3), and the requirements of Sections IV.A.6 and A.7 of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to emergency response support and resources, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.4 Emergency Classification System

Paragraph 50.47(b)(4) of 10 CFR, as exempted for Oyster Creek, requires that a licensee's emergency response plan contain:

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

The Oyster Creek PDEP identifies that the emergency classification system covers a spectrum of possible radiological and non-radiological emergencies at Oyster Creek, considering the permanently shutdown and defueled status of the facility. A graded scale of response for distinct classifications of emergency conditions, actions appropriate for those classifications, and criteria for escalation to a more severe classification are provided. The revised EAL scheme categorizes accidents and/or emergency situations into one of two ECLs depending on emergency conditions at the time of the incident. The ECLs applicable at Oyster Creek, considering the permanently shutdown and defueled status of the facility, in order of increasing severity, will be a Notification of Unusual Event (Unusual Event) and Alert. Each of these ECLs requires notification to the State of New Jersey, as well as the NRC, as designated in the Oyster Creek PDEP. The classification of emergencies up to an Alert is consistent with the regulations for an ISFSI in 10 CFR 72.32(a)(3) and the exemptions granted for Oyster Creek, as described in the NRC's letter dated October 16, 2018.

The Oyster Creek EAL scheme is based on NEI 99-01, Revision 6, as applied to a permanently shutdown and defueled power reactor with fuel stored in an onsite SFP and ISFSI, which specifies emergency classification levels of an Unusual Event and Alert. When indications are available to on-shift personnel that an EAL has been met, the event is assessed and the corresponding emergency classification level is declared. The Oyster Creek maintains the capability to assess, classify, and declare an emergency condition within 30 minutes after the availability of indications that an EAL threshold has been reached. Emergency classifications are to be made as soon as conditions are present and recognizable for the classification in accordance with the applicable EALs, but within 30 minutes in all cases after the availability of

indications to operators that an EAL threshold has been reached. The initiating conditions, their corresponding ECLs, and the technical bases for each classifiable EAL threshold are contained in the Oyster Creek EAL Permanently Defueled Emergency Action Levels and Bases Document (Attachment 3 to the licensee's letter dated August 29, 2017).

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies: (1) that the emergency classification system covers a spectrum of possible radiological and non-radiological emergencies at Oyster Creek; (2) a graded scale of response for distinct classifications of emergency conditions: (3) actions appropriate for those classifications, and (4) criteria for escalation to a more severe classification. The specific instruments, parameters, or equipment status are described for each emergency classification level in the EAL scheme. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(4), and the requirements of Sections IV.B.1, C.1, and C.2 of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to the emergency classification system, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.5 Notification Methods and Procedures

Paragraph 50.47(b)(5) of 10 CFR, as exempted for Oyster Creek, requires that a licensee's emergency response plan contain:

> 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.**~~

The Oyster Creek PDEP identifies the Emergency Director position, which is assumed by the Shift Manager, as having the authority and responsibility for initiating notifications to Federal and State officials following the declaration of an Unusual Event or Alert. On-site staff is informed of an emergency condition through the use of the facility public address system, office telephone, and/or wireless devices capable of receiving telephone calls and text messages. In the event that personnel required to staff ERO positions are not on-site at the time an emergency is declared, they may be contacted by commercial telephone, including land lines and/or wireless devices capable of receiving telephone calls and text messages. Mobilization of the ERO will be conducted under the direction of the Emergency Director, according to personnel assignments and telephone numbers maintained in various telephone directories.

Notification to the responsible authorities in the State of New Jersey is required within 60 minutes of the declaration of an ECL. The State of New Jersey will then have responsibility to notify their respective counties, as deemed appropriate. The commercial telephone network serves as the primary means to provide emergency notification to the designated State points of contact, and is used to provide initial and updated notifications and for general information flow with these agencies. In the event the commercial telephone system is unavailable, wireless communications can be used to make emergency notifications. In addition, electronic means may be used to transmit the notification message.

The licensee, in coordination with the State of New Jersey, has established the contents of the initial emergency messages to be sent from Oyster Creek in the event an emergency classification is declared. The New Jersey Office of Emergency Management may request the following information from Oyster Creek:

1. date and time of the incident,
2. emergency classification,
3. status of the facility,
4. whether a release has occurred, is occurring or is anticipated to occur,
5. actual or projected dose rates at the Site boundary, and
6. whether or not offsite assistance is needed.

The NRC Emergency Notification System is a dedicated telephone system used to notify the NRC Operations Center of an emergency declaration. The NRC will be notified as soon as possible after notification of the State of New Jersey and within 60 minutes of the declaration of an ECL or change in classification. In the event that the NRC Emergency Notification System fails, commercial phone lines will be used to notify the NRC Operations Center. Notification to the NRC is the responsibility of the Emergency Director.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately describes the process for initiating notifications to the NRC and State officials, and the contents of the emergency messages to be sent. The licensee, in cooperation with the State of New Jersey, has established mutually agreeable methods and procedures for notification of OROs (as discussed above), consistent with the EAL scheme and the contents of the initial notification form. Follow-up reports are provided as additional information describing the emergency situation becomes available and on an as-needed basis until such time that the emergency condition has been terminated. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(5), and the requirements of Sections IV.A.6, A.7, C.1, C.2, D.1, and D.3 of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to notification methods and procedures, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.6 Emergency Communications

Paragraph 50.47(b)(6) of 10 CFR, as exempted for Oyster Creek, requires that a licensee's emergency response plan contain:

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

A number of communications systems are available for use among the principal response organizations. The Control Room is where facility systems and equipment parameters are monitored and is continuously occupied as per the licensee's technical specifications. Control Room personnel assess facility conditions and perform notifications. The Emergency Director is responsible for the notification of an emergency declaration to the State of New Jersey. Ocean County, Lacey Township, and Ocean Township will be notified by the State of New Jersey, as necessary, when an ECL declaration or other State Emergency Operations Center notification

has been made by Oyster Creek. Notification to the State of New Jersey is required within 60 minutes after the availability of indications to operators that an EAL threshold has been reached.

There are extensive and reliable communication systems installed at Oyster Creek. Examples of the communications network include systems such as telephone lines, fiber-optic voice channels, cell phones, satellite phones, mobile radio units, handi-talkies and computer peripherals. The facility paging system provides facility-wide paging from the Control Room and all remote stations plus private communications during normal operating conditions. The facility paging system provides immediate warning and instructions to onsite personnel in the event of an emergency. Phone stations and speakers of this subsystem are located in key locations within the facility.

The commercial telephone system, as discussed previously in Section 4.1.5 of this safety evaluation, is the primary communication means between Oyster Creek, and State and county agencies, and is used to provide initial and follow-up notifications and for general information flow between these agencies.

Additional methods of communication are available to Oyster Creek staff to transmit information onsite and offsite during normal and emergency situations. Portable radios may be utilized by station personnel and ERO personnel during an emergency. The telephone system can be used for in-facility as well as outside communications.

The telephone system is also used as the primary means to activate the ERO, as directed by the Emergency Director. In the event that personnel required to staff emergency positions are not on-site at the time an emergency is declared, they may be contacted by commercial telephone, including land lines and/or wireless devices capable of receiving telephone calls and text messages. Telephone numbers are maintained in various telephone directories. The phone system includes many automated or programmable features that improve notification and allow flexibility. Radio communication equipment used during normal facility operations will be used in an emergency to communicate with mobile units and to provide backup to the telephone system. In addition, electronic means may be used to transmit the notification message. NRC event notifications and status are communicated via the NRC Emergency Notification System.

Periodic testing of the emergency communications system are described in Section 11.1.2, "Communication Tests" of the Oyster Creek PDEP.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies that provisions exist for prompt communications among principal response organizations to emergency personnel. The communication methods provide a reliable primary and backup means of communication; and for plant-to-offsite communications with Federal, State, and local agencies. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(6) and the requirements of Sections IV.C.1, D.1, and D.3 of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to emergency communications, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.7 Public Education and Information

Paragraph 50.47(b)(7) of 10 CFR, as exempted, requires that a licensee's emergency response plan contain:

> ~~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.

As part of its normal corporate structure, Exelon maintains a Corporate Communications Office that can be called upon to provide resources as necessary. The spokesperson function would typically be performed by Communications personnel. Communications personnel will be notified of an emergency declaration and would serve as a spokesperson. However, the function could also be performed by plant or corporate management. Upon receiving notification of an emergency declaration, the spokesperson contacts the Control Room and receives a brief description of the event. The spokesperson monitors media activity and coordinates with senior management to address rumors and disseminate information to the public. The spokesperson will participate in news conferences as appropriate with Federal, State, and local emergency response organizations conducted from the site or at other locations, as necessary.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP organization includes a communications position that would serve as the licensee's designated spokesperson should an emergency be declared at Oyster Creek. The spokesperson is available for media inquiries, and the positional duties include maintaining liaison with local media and coordinating with Federal, State, and local response organizations to disseminate appropriate information regarding an emergency at Oyster Creek. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(7), and the requirements of Sections IV.A.7 and D.2 of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to public education and information, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.8 Emergency Facilities and Equipment

Paragraph 50.47(b)(8) of 10 CFR requires that a licensee's emergency response plan contain:

> Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

The Oyster Creek PDEP identifies that, following the declaration of an emergency, the activities of the ERO are coordinated from the Control Room, where command and control is maintained. Control Room personnel assess facility conditions, evaluate the magnitude and potential consequences of abnormal conditions, initiate preventative, mitigating, and corrective actions and perform notifications.

The Control Room is where facility systems and equipment parameters are monitored and is continuously occupied as per technical specifications. The Control Room staff coordinates all phases of emergency response and corrective action required to restore the facility to a safe condition. Classification and subsequent declaration of the appropriate ECL, and decision to mobilize the ERO, is made by the Shift Manager. The Control Room staff's attention focuses on mitigating the emergency as the ERO reports to their designated locations and is delegated emergency functions. When activated, the ERO reports to the Shift Manager, as the Emergency Director, to assist the on-shift staff in the assessment, mitigation, and response to an emergency and to support the dispatch of emergency teams.

The licensee maintains and operates on-site monitoring systems needed to provide data that are essential for initiating emergency measures and performing accident assessment, including dose assessment and assessing the magnitude of a release. This includes monitoring systems for facility processes, radiological conditions, meteorological conditions, and fire hazards. Annunciator and computer alarms are provided for a variety of parameters, including SFP level and temperature. The manner in which process monitors are used for accident recognition and classification is detailed in Oyster Creek's Permanently Defueled EALs.

Radiation monitors provide continuous radiological surveillance. These monitors, which include Control Room readout and alarm functions, exist in order that appropriate action can be initiated to limit fuel damage and/or contain radioactive material. The onsite Radiation Monitoring System (RMS) contributes to personnel protection, equipment monitoring, data gathering, and accident assessment by measuring and recording radiation levels and concentrations of radioactive material at selected locations within the facility.

In addition to installed monitoring systems, onsite portable radiation and contamination monitoring equipment is available. The Control Room contains communications equipment, emergency radiation monitoring equipment, and emergency respiratory devices. Adjacent rooms store radiation protection clothing and other emergency supplies.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies that during a declared emergency, command and control is maintained in the Control Room. Facility personnel assess conditions; evaluate the magnitude and potential consequences of abnormal conditions; initiate preventative, mitigating, and corrective actions; and perform onsite and offsite notifications. When activated, the ERO reports to the Control Room. Section 5.0, "Emergency Response Facilities and Equipment," of the Oyster Creek PDEP identifies the general category of equipment and supplies that make up equipment available to assist with emergency response. Section 11.4, "Maintenance and Inventory of Emergency Equipment and Supplies," of the Oyster Creek PDEP discusses the inventory and maintenance of equipment. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(8), and the requirements of Sections IV.A and G of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to emergency facilities and equipment, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.9 Accident Assessment

Paragraph 50.47(b)(9) of 10 CFR, as exempted, requires that a licensee's emergency response plan contain:

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

Station procedures provide preventative and/or corrective actions that mitigate the consequences of events. Instrumentation, control systems, and radiation monitoring systems provide indications related to the safe and orderly implementation of corrective actions. These systems provide indication of SFP storage inventory, temperature, cooling, and supporting systems, and are discussed further in Section 4.1.8 of this safety evaluation.

The licensee maintains procedures and strategies for the movement of any necessary portable equipment that will be relied upon for mitigating the loss of SFP water level and cooling. These mitigative strategies are maintained in accordance with License Condition 2.C.(8) of the Oyster Creek RFOL and technical specifications. 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.

Emergency plan implementing procedures (EPIPs) utilize radiological instrumentation readings and meteorological data to provide a rapid method of determining the magnitude of a radioactive release during an emergency. The licensee is capable of performing dose assessment 24 hours a day, 7 days a week. Initial dose assessment is performed by qualified on-shift personnel, under the direction of the Emergency Director. When the ERO is augmented, the RP Coordinator assumes subsequent dose assessment responsibilities.

The National Weather Service office in Mount Holly, New Jersey, provides meteorological information (e.g., wind speed, temperature, and wind direction) from several locations in the vicinity of Oyster Creek. This information is available by telephone or the internet. The data are used to determine the projected radiological consequences in the event of an accidental release of radioactivity to the environment.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because Section 9.0, "Radiological Assessment and Protective Measures," of the Oyster Creek PDEP adequately identifies the onsite capabilities and resources available to provide initial and continuing information for accident assessment throughout the course of an event. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(9), and the requirements of Sections IV.A.4, B.1, C.2, and E of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to accident assessment, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.10 Protective Response

Paragraph 50.47(b)(10) of 10 CFR, as exempted, requires that a licensee's emergency response plan contain:

> A range of protective actions has been developed for the ~~plume exposure pathway EPZ for~~ emergency workers and the public. ~~In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.~~

The Oyster Creek PDEP identifies the protective actions for onsite personnel, including station personnel, contractors, and visitors (members of the public) located onsite, and will include:

- site personnel accountability,
- site egress control methods,
- contamination control and decontamination capability,
- use of protective equipment and supplies, and
- medical and health support.

Accountability is considered and used as a protective action whenever a site-wide risk to health and safety exists and prudence dictates. If personnel accountability is required, at the direction of the Emergency Director, all individuals at the site (including non-essential employees, visitors, and contractor personnel) shall be notified by sounding the facility alarm and making announcements over the Public Address System. Following announcement of an emergency declaration, and when accountability has been requested, facility personnel are responsible for reporting to designated areas and aiding Security in the accountability process. Station procedures also provide actions to protect personnel during hostile actions.

Accountability of all personnel on the site should be accomplished within 60 minutes of the accountability announcement. If personnel are unaccounted for, teams shall be dispatched to locate the missing personnel. Accountability may be modified or suspended if the safety of personnel may be jeopardized by a security event or other event hazardous to personnel.

All visitors and unnecessary contractors are evacuated from the facility at the discretion of the Emergency Director. In the event of a suspected radiological release, personnel are monitored for radioactive contamination prior to leaving the protected area. Portable radiation survey meters are available to monitor for potential contamination.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because Section 9.3, "Protective Measures," of the Oyster Creek PDEP adequately identifies the protective actions for onsite personnel, including station personnel, contractors, and visitors (members of the public), and provides that protective equipment and supplies are maintained to support an

emergency response. The Oyster Creek PDEP also describes that plant evacuees are monitored for radioactive contamination prior to leaving the protected area. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(10), and the requirements of Sections IV.C.1, E, and I of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to protective response, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.11 Radiological Exposure Control

Paragraph 50.47(b)(11) of 10 CFR requires that a licensee's emergency response plan contain:

> Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

The Oyster Creek PDEP states that reasonable measures are taken to control the radiation exposure to emergency response personnel providing rescue, first aid, decontamination, emergency transportation, medical treatment services, or corrective or assessment actions within applicable limits specified in 10 CFR Part 20. The RP Coordinator is responsible for developing emergency radiological protection programs for ERO and augmented personnel. Emergency kits are provided with self-reading dosimeters. Each member reporting to the site will be provided a Dosimeter of Legal Record (DLR). The Shift Manager/Emergency Director has the responsibility to authorize emergency dose commitments in excess of 10 CFR Part 20 limits. This authorization is coordinated with the assistance of the RP Coordinator. Table 9.1, "Emergency Dose Limits," of the Oyster Creek PDEP contains the guidelines for emergency exposure criteria, which is consistent with Table 2-2, "Guidance on Dose Limits for Workers Performing Emergency Services," provided in the 1992 EPA PAG Manual (Reference 12).

The facility supplies personnel radiation protection equipment and gear that are utilized to support the emergency response effort. Equipment such as respiratory protection gear and protective clothing is assigned to emergency response organization members and facility response personnel in accordance with established facility radiation protection criteria.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies the means for controlling radiological exposures for emergency workers. Emergency worker dose limits are established for designated activities and under specific conditions. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(11), and the requirements of Section IV.E of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to radiological exposure control, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.12 Medical and First Aid Support

Paragraph 50.47(b)(12) of 10 CFR requires that a licensee's emergency response plan contain:

> Arrangements are made for medical services for contaminated injured individuals.

The Oyster Creek PDEP identifies that Oyster Creek maintains on-shift personnel and equipment to provide first aid for personnel working at the site. Medical supplies for emergency first aid treatment are provided on the site at various locations. The Oyster Creek PDEP further provides that if immediate professional medical help is needed, local ambulance services are available to transport seriously ill, injured, or radioactively contaminated injured personnel to a designated medical facility.

Agreements are in place with Community Medical Center and Southern Ocean Medical Center for medical support for work related injuries and for handling radioactively contaminated patients from Oyster Creek. Refer to Section 4.1.1 of this safety evaluation for a description of agreements made with respective OROs responding onsite to Oyster Creek in the event of an emergency.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies that arrangements are maintained for primary and backup hospitals or medical facilities located in the vicinity of the station, and for prompt ambulance transport of persons with injuries involving radiological contamination to designated hospitals. The licensee also maintains onsite first aid supplies and equipment necessary for the treatment of contaminated or injured persons. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(12), and the requirements of Sections IV.A.6, A.7, and E of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to medical and first aid support, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.13 Recovery and Reentry

Paragraph 50.47(b)(13) of 10 CFR requires that a licensee's emergency response plan contain:

> General plans for recovery and reentry are developed.

The Oyster Creek PDEP identifies that planning for the recovery involves the development of general principles and an organizational capability that can be adapted to any emergency situation. Upon termination of an emergency and transition to the recovery phase, the Emergency Director assembles the recovery organization to address the specific emergency circumstances of the terminated event.

The Emergency Director directs the recovery organization and is responsible for:

- Ensuring the facility is maintained in a safe condition,
- Managing onsite recovery activities, and
- Keeping corporate support apprised of recovery activities and requirements.

The remainder of the recovery is accomplished using the normal facility organization and ERO, as necessary, to provide radiological and technical expertise to the Emergency Director in order to restore the facility to normal conditions. The recovery organization's responsibilities include:

- Maintaining comprehensive radiological surveillance of the facility to assure continuous control and recognition of problems,
- Controlling access to the area and exposure to workers,
- Decontaminating affected areas and/or equipment,
- Conducting clean-up and restoration activities,
- Isolating and repairing damaged systems, and
- Documenting all proceedings of the event and reviewing the effectiveness of the emergency organization in reducing public hazard and plant damage.

When plant conditions allow a transition from the emergency phase to the recovery phase, the Emergency Director conducts a plant emergency management meeting to discuss the recovery organization. The actions taken by this organization concerning termination of the emergency proceeds in accordance with a recovery plan developed specifically for the accident conditions.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies the general goals for plant recovery, and the licensee's recovery organization will be based on a normal Oyster Creek organization and function with an Oyster Creek executive management position responsible for directing all site activities. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(13), and the requirements of Section IV.H. of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to recovery and reentry, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.14 Exercises and Drills

Paragraph 50.47(b)(14) of 10 CFR requires that a licensee's emergency response plan contain:

> Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

The Oyster Creek PDEP identifies that periodic exercises are conducted to evaluate major portions of emergency response capabilities. Biennial exercises shall be conducted to test the timing and content of implementing procedures and methods, and to ensure that emergency personnel are familiar with their duties. The OROs are offered the opportunity to participate to the extent assistance would be expected during an emergency declaration.

An Exercise/Drill Coordinator is responsible for the overall development of the scenario package. A scenario development team is assembled (if needed) by the Exercise/Drill Coordinator to create the various segments of the scenario which include, but are not limited to, the following:

- objective(s),
- date, time period, place and participating organizations,
- simulation lists,
- timeline of real and simulated events,
- narrative summary, and
- list of controllers and participants.

The final scenario shall be approved by a designated member of senior facility management, and scenario confidentiality maintained.

Periodic drills are conducted to develop and maintain key emergency response skills. Deficiencies as a result of exercises or drills are identified and corrected. Medical drills are conducted annually, involving a simulated contaminated injury.

Health physics drills are conducted semi-annually involving response to, and the analysis of, simulated, elevated in-facility airborne and liquid samples and direct radiation measurements in the environment. This drill can be performed as part of any drill or exercise.

Off-hours, unannounced augmentation drills shall be conducted semi-annually to estimate ERO personnel response times. No actual travel is required. Participants provide an estimated time of arrival to their designated ERO position.

Fire drills are conducted in accordance with the respective Oyster Creek Fire Protection Plan and procedures.

The NRC Emergency Notification System used to communicate with the NRC is tested monthly. Other communication systems, as detailed in Section 6.0 in the Oyster Creek PDEP, are used on a frequent basis. Therefore, periodic testing of these systems is not necessary.

Critiques will evaluate the participant's performance during a drill or exercise. Exercise and drill performance objectives are evaluated against measurable demonstration criteria. As soon as possible following the conclusion of each drill/exercise, a critique, including participants, controllers, and evaluators, is conducted to evaluate the ability of the participants to meet the performance objectives. Deficiencies are identified and entered into the corrective action system. A written report is prepared, including the evaluation of designated objectives, and references corrective actions and recommendations resulting from the drill/exercise. The Manager – Emergency Planning is responsible for ensuring that items identified in the critique are correctly dispositioned and for ensuring resolution of each item under the site's corrective actions program.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies the general goals for exercises and drills, the intent of exercise scenarios, and that exercise and drill performance objectives are evaluated against measurable

demonstration criteria. As soon as possible following the conclusion of each exercise or drill, a critique will be conducted. The Manager – Emergency Planning is responsible for ensuring that items identified in the critique are correctly dispositioned and for ensuring resolution of each item under the site's corrective actions program. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(14), and the requirements of Sections IV.E.9 and F of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to exercises and drills, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.15 Radiological Emergency Response Training

Paragraph 50.47(b)(15) of 10 CFR requires that a licensee's emergency response plan contain:

> Radiological emergency response training is provided to those who may be called on to assist in an emergency.

The Oyster Creek management is responsible to ensure that all members of the ERO receive the required initial training and continuing training. The training program for ERO personnel is based on applicable requirements of Appendix E to 10 CFR Part 50 and position-specific responsibilities as defined in the PDEP. The ERO personnel in the following categories receive initial training and annual retraining.

Shift Managers/Emergency Directors, Technical Coordinators, and RP Coordinators shall have training conducted such that proficiency is maintained on topics listed below. These topics should be covered as a minimum on an annual basis:

- EAL classification,
- dose assessment,
- Federal, State, and local notification procedures,
- ERO augmentation,
- emergency exposure control, and
- mitigating strategies for a catastrophic loss of SFP inventory.

The Oyster Creek personnel are available during emergencies to perform emergency response activities as an extension of their normal duties, and receive duty specific training. This includes facility on-shift, maintenance, radiation protection, and security personnel. Personnel assigned to liaison with offsite fire departments are trained in accordance with the Fire Protection Program. Personnel assigned the responsibility of on-shift first aid shall attend first aid training.

An overview of the Oyster Creek PDEP will be given to all personnel allowed unescorted access into the protected area at Oyster Creek. Personnel will receive this information during initial training and will be requalified on an annual basis. This training will include identification of the emergency alarm, the fire alarm, and the steps to follow for a plant and site evacuation.

Training is offered annually to OROs, which may provide specialized services during an emergency in responding to Oyster Creek (fire-fighting, medical services, transport of contaminated and/or injured personnel, etc.). The training shall be structured to meet the needs of that organization with respect to the nature of its support. Topics of event notification, site access, basic radiation protection and interface activities are included in the training.

The Oyster Creek procedures outline the process to document training of the ERO and to verify training provided to OROs.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies the level and depth of the emergency preparedness training program to which individuals are to be trained, and the training for ERO personnel is developed from position-specific responsibilities defined in the PDEP. Training is provided or formally offered annually to OROs. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(15), and the requirements of Section IV.F of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to radiological emergency response training, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.1.16 Emergency Plan Development and Review

Paragraph 50.47(b)(16) of 10 CFR requires that a licensee's emergency response plan contain:

> Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

Senior plant leadership is responsible for the implementation of actions required to periodically exercise the Oyster Creek PDEP and the EPIPs, and for maintaining an effective ERO staff. The facility Plant Manager has overall responsibility for implementation of the Oyster Creek PDEP, with the overall Oyster Creek PDEP maintained by the Corporate Emergency Preparedness Organization. The Site Emergency Preparedness Specialist is assisted by the Corporate Emergency Preparedness Organization. The specific duties include, but are not limited to, revise and update the Oyster Creek PDEP; maintain the EPIPs so that they are updated and current with the Oyster Creek PDEP; represent the facility in offsite emergency plan interfaces; represent the facility in NRC emergency planning appraisals and audits, and maintain drill and exercise documentation and coordinate implementation of corrective actions deemed necessary following drills and exercises. The Site Emergency Preparedness Specialist is responsible for maintaining an adequate knowledge of regulations, planning techniques, and the latest applications of emergency equipment and supplies.

The Oyster Creek PDEP, Permanently Defueled EAL Technical Bases Document, and the EPIPs included in Appendix A to the PDEP are reviewed annually and updated as needed. All proposed changes will be reviewed in accordance with 10 CFR 50.54(q) to ensure that the change would not compromise the effectiveness of any other EPIPs or degrade the effectiveness of the PDEP.

Letters of Agreement with support agencies shall be reviewed annually. Agreements will be revised or recertified. Recertification may include a recertification letter/memorandum, purchase order, e-mail, documented telephone conversation, or other correspondence. Designated Oyster Creek management has the authority to enter into these agreements with outside organizations.

The EAL scheme is reviewed with the State authorities of New Jersey on an annual basis.

The Oyster Creek Emergency Telephone Directory will be maintained in specified locations and updated quarterly.

Periodic inventory, testing, and calibration of emergency equipment and supplies are conducted in accordance with approved facility procedures. This equipment includes, but is not limited to:

- portable radiation monitoring equipment,
- emergency medical response equipment,
- dosimeters, and
- portable radios.

Emergency equipment and instrumentation shall be inventoried, inspected, and operationally checked periodically as indicated by the procedure and after each use. Sufficient reserves of equipment and instrumentation are stocked to replace emergency equipment and instrumentation removed from service for calibration and/or repair.

Based on the NRC staff's review of the Oyster Creek PDEP as described above, the NRC staff finds that the proposed Oyster Creek PDEP meets the applicable evaluation criteria of NUREG-0654, as outlined in Attachment 1 to NSIR/DPR-ISG-02, because the Oyster Creek PDEP adequately identifies responsibility for the issuance, control, and revision/updating of the PDEP, EPIPs, and support documents, including required changes identified during audits, assessments, training, drills, and exercises. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(16), and the requirements of Section IV.G of Appendix E to 10 CFR Part 50, as exempted for Oyster Creek, pertaining to emergency plan development and review, are addressed in an acceptable manner in the Oyster Creek PDEP, considering the permanently shutdown and defueled status of the facility.

4.2 Emergency Action Level Scheme

The licensee currently utilizes an EAL scheme based on NEI 99-01, Revision 6, with site-specific modifications due to design issues and/or licensee preference. The licensee is revising its current EAL scheme using the guidance in Section 8, "Independent Spent Fuel Storage Installation (ISFSI) ICs [Initiating Conditions] and EALs," and Appendix C, "Permanently Defueled Station ICs/EALs," of NEI 99-01, Revision 6, as applied to a permanently shutdown and defueled power reactor with fuel stored in an onsite SFP and ISFSI, with site-specific modifications due to design issues and/or licensee preference.

As discussed in the NRC staff's safety evaluation associated with the exemptions granted to Oyster Creek from certain EP planning standards of 10 CFR 50.47 and requirements of Appendix E to 10 CFR Part 50 (Reference 11), there are no longer any design-basis accidents at Oyster Creek that can result in a radiological release exceeding the EPA PAGs at the exclusion area boundary. Therefore, the NRC staff's assessment of the risks and consequences of a radiological release at Oyster Creek, based on its permanently shutdown and defueled condition, concluded that the risks and consequences are insufficient to warrant emergency classification levels for a Site Area Emergency or General Emergency. As a result, the only ECLs applicable to Oyster Creek are an Unusual Event or an Alert.

In its letter dated August 29, 2017 (Reference 1), Exelon submitted its proposed EAL scheme for Oyster Creek in the permanently shutdown and defueled condition, along with its technical

basis and the EAL numbering scheme. The proposed EAL scheme is unique to Oyster Creek, as it contains site-specific designations and descriptions.

The NRC staff verified that the proposed EAL scheme is consistent with the guidance provided in Section 8 and Appendix C to NEI 99-01, Revision 6, to ensure that the proposed EAL scheme meets the standards of 10 CFR 50.47(b)(4) and requirements of Section IV.B of Appendix E to 10 CFR Part 50, as exempted for a permanently shutdown and defueled power reactor with spent fuel stored onsite in the SFP and ISFSI. The NRC staff reviewed the proposed EAL scheme, technical basis, comparison matrix, and all additional information provided and found that the proposed EAL scheme has site-specific modifications from the NEI 99-01, Revision 6, guidance due to specific plant designs and licensee preference.

The NRC staff verified that the instrumentation and setpoints derived for the proposed EAL scheme are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme.

Although the EALs must be plant-specific, to ensure consistency and regulatory stability, the NRC staff reviewed the proposed EAL scheme with respect to the key characteristics listed below of an effective EAL scheme found in the NRC-endorsed guidance of NEI 99-01, Revision 6.

- Consistency, including standardization of intent, if not in actual wording (i.e., the EALs would lead to similar decisions under similar circumstances at different plants).
- Human factors engineering and user friendliness.
- Potential for emergency classification level upgrade only when there is an increasing threat to public health and safety.
- Ease of upgrading and downgrading the ECL.
- Thoroughness in addressing and disposing of the issues of completeness and accuracy raised in Appendix 1 to NUREG-0654 (i.e., the EALs are unambiguous and are based on site-specific indicators).
- Technical completeness for each ECL.
- Logical progression in classification for multiple events.
- The use of objective and observable values.

The Oyster Creek EAL technical basis document is an integral part of the EAL scheme. The material in this document supports proper emergency classification decision-making by providing informed background and development information in a readily accessible format. It can be referred to in training situations and when making an actual emergency classification, if necessary. The document is also useful for establishing configuration management controls for emergency preparedness-related equipment and explaining an emergency classification to offsite authorities.

To aid in understanding the nomenclature used in this safety evaluation, the proposed EAL scheme for Oyster Creek includes two ECLs: Unusual Event (U), and Alert (A). Initiating conditions (ICs) for entry into each of the two ECLs are specified for conditions relating to:

- Abnormal Radiation Levels/Radiological Effluent (PD-R),
- Hazards and Other Conditions Affecting Plant Safety (PD-H),
- System Malfunction (PD-S), based on the permanently shutdown and defueled status of the facility with spent fuel stored onsite in an SPF, and
- Hazards and Other Conditions Affecting ISFSI (E-H).

This safety evaluation uses the numbering system from the proposed plant-specific EAL scheme; however, the numbering system from the generic EAL scheme development guidance contained in NEI 99-01, Revision 6, is annotated in brackets to aid in cross-referencing the site-specific EAL numbering convention with that of the guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, and ease of upgrading/downgrading for this EAL are consistent with the overall EAL scheme development guidance and address the plant-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

For each IC, specific EAL threshold values are identified that would require the declaration of an ECL. The EAL scheme is intended to provide multiple and diverse threshold values for an Unusual Event and Alert to ensure accurate classification and timely declaration.

The Oyster Creek site made the following changes to the generic EAL scheme, throughout the proposed EAL scheme, as follows:

- Used the term "Unusual Event (UE)" instead of "Notification of Unusual Event (NOUE)," as Oyster Creek determined that its use was consistent with the current EAL matrix and agreed in meaning and intent with NEI 99-01, Revision 6;
- Added Recognition Category ("Category");
- Removed the emergency classification level as it is identified in the IC;
- Removed reference to "Operating Mode," as it did not apply in a permanently defueled condition;
- Removed the "Example Emergency Action Levels;"
- Removed "SAFETY SYSTEM" as the item is not applicable in the permanently shutdown and defueled condition;
- Changed the numbering of the EALs, and
- Added site-specific basis information.

The NRC staff determined that these changes are administrative in nature, and as such, acceptable, since they do not impact the overall EAL scheme.

An evaluation of the acceptability of the proposed EAL scheme is provided in the following sections.

4.2.1 Category "PD-R" [PD-A]: Abnormal Radiation Levels/Radiological Effluent

4.2.1.1 EAL PD-RU1, "Release of gaseous or liquid radioactivity greater than 2 times the ODCM (Offsite Dose Calculation Manual) limits for 60 minutes or longer"

This EAL addresses a potential or actual decrease in the level of safety of the plant, as indicated by a low level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or unmonitored, including those for which a radioactivity discharge permit is normally prepared.

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Inserted "ODCM" for the site-specific effluent release controlling document.
- Provided additional provision for classification based on effluent monitor readings.
- Removed "radiation" from monitor notation.
- EAL (1) is not used since there are no effluent radiation instrument monitored batch release pathways at Oyster Creek. Added new EAL 1 as per previous Oyster Creek EALs based on a continuous effluent release pathway threshold. This will provide an Unusual Event level threshold based on a monitor threshold and provide escalation to the Alert level threshold.
- Included Table R-1, "Effluent Monitor Thresholds," to provide effluent monitor description and threshold values.
- Provided additional provisions for using sample analysis results of a gaseous or liquid release as an action level.
- No EAL threshold has been developed for liquid releases as the liquid discharge system flow path has been closed off with a facility modification installed blank flange.

For the site-specific change to reference the ODCM, the NRC staff verified that Oyster Creek implemented the developer notes for identifying the site-specific effluent release controlling document identified in NEI 99-01, Revision 6, as the basis for this specific EAL. The site-specific changes to the generic EAL scheme are administrative and do not affect the applicability of the EAL.

The NRC staff verified that the Oyster Creek Permanently Defueled EAL Technical Bases Document (Attachment 3 of the Oyster Creek application) provides the specific ODCM references that the high alarm setpoint for the stack gas monitor is established to ensure that the ODCM release limits are not exceeded.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.1.2 EAL PD-RA1 [PD-AA1], "Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRem [millirem] TEDE [total effective dose equivalent] or 50 mRem thyroid CDE [committed dose equivalent]"

This EAL addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1 percent of the EPA PAGs. It includes both monitored and unmonitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant, uncontrolled release).

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Provided additional provision for classification based on effluent monitor readings.
- Included Table R1 to provide site-specific effluent monitor description.
- Added "site boundary" as the site-specific dose receptor point.
- No EAL threshold has been developed for liquid releases as the liquid discharge system flow path has been closed off with a facility modification installed blank flange.

The site-specific changes to the generic EAL scheme are administrative and do not affect the applicability of the EAL.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.1.3 EAL PD-RU2 [PD-AU2], "UNPLANNED rise in facility radiation levels"

This EAL is based upon site-specific indications of increased plant radiation levels caused by a decrease in water level above irradiated (spent) fuel. The increased radiation levels are indicative of a minor loss in the ability to control radiation levels within the plant. This condition is a potential degradation in the level of safety of the plant.

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Provided site-specific level indication that corresponds to SFP low-level alarm.
- Provided area radiation monitoring for specific location.
- Modified wording to align with the previously approved wording in the Oyster Creek basis for EAL RU2, which is slightly different than the wording in NEI 99-01.

The site-specific changes to EAL PD-RU2 are in accordance with the guidance provided in NEI 99-01, Revision 6, for this specific EAL. The developer notes in NEI 99-01, Revision 6, provide that the site-specific indications may include instrumentation values, such as water level, area radiation monitoring readings, and personnel reports. These indications are installed plant equipment with indications in the Control Room that provide timely indication for classifying this EAL. Therefore, the SFP low-level alarm monitors are acceptable site-specific indications of increased plant radiation levels caused by a decrease in water level above irradiated (spent) fuel. The licensee provides that besides a water level loss being primarily determined by indications from available level instrumentation, other sources of level indications may include reports from plant personnel or video camera observations (if available), or from any other temporarily installed monitoring instrumentation. A significant drop in the water level may also cause an increase in the radiation levels of adjacent areas that can be detected by monitors in those locations.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.1.4 EAL PD-RA2 [PD-AU2], "UNPLANNED rise in plant radiation levels that impedes plant access required to maintain spent fuel integrity"

This EAL addresses increased radiation levels that impede necessary access to areas containing equipment that must be operated manually or that require local monitoring in order to maintain systems needed to maintain spent fuel integrity. As used here, "impede" includes hindering or interfering, provided that the interference or delay is sufficient to significantly threaten necessary plant access. As such, it represents an actual or potential substantial degradation of the level of safety of the plant.

The Alert classification for this EAL is primarily intended to ensure that the ERO is activated to support the on-shift personnel in removing the impediment to normal access to maintaining spent fuel integrity.

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific change to the generic EAL scheme:

- Added site-specific areas to EAL #1 and EAL #2, required to maintain spent fuel integrity.

For the site-specific change to EAL PD-RA2, the developer notes in NEI 99-01, Revision 6, provide that the list should include all areas requiring continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity. The list that Oyster Creek provided includes three facility areas that contain equipment which require a manual/local action necessary when moving fuel or manipulating SFP cooling equipment.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.2 Category "PD-H": Hazards and Other Conditions Affecting Plant Safety

4.2.2.1 EAL PD-HU1, "Confirmed SECURITY CONDITION or threat"

This EAL is based upon any security-related event listed in the approved Oyster Creek Physical Security Plan that constitutes a threat/risk to site personnel or a potential degradation to the level of safety of the plant.

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Added "OR" to reflect the EAL conditions that represent entry into the classification.

- Added security procedure to aide determining the notification of a credible threat.
- Security Force is identified as the site-specific security shift supervision.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.2.2 EAL PD-HA1 [PD-HA1], "HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes"

This EAL addresses the occurrence of a hostile action within the Owner Controlled Area or notification of an aircraft attack threat. This event will require rapid response and assistance due to the possibility of the attack progressing to the protected area, or the need to prepare the plant and staff for a potential aircraft impact.

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific change to the generic EAL scheme:

- Security Force is identified as the site-specific security shift supervision.

The developer notes in NEI 99-01, Revision 6, provide that the "Security Force is provided as the site specific security shift supervision."

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard to 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.2.3 EAL PD-HU2 [PD-HU2], "Hazardous Event affecting equipment necessary for spent fuel cooling"

This EAL is based upon the effect that natural and destructive hazards may have on at least one train of a safety system needed for spent fuel cooling. The damage must be of sufficient magnitude that the system(s) train cannot, or potentially cannot, perform its design function. This condition reduces the margin to a loss or potential loss of the fuel clad barrier and, therefore, represents a potential degradation of the level of safety.

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific changes Identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- For EAL 1.a., added extreme high or low tides as a site-specific hazard.
- For EAL 1.b., replaced "SAFETY SYSTEM" with "system"

The licensee provided that this EAL addresses a hazardous event that causes damage to at least one train of equipment needed for spent fuel cooling. All systems required to support SFP cooling will be considered to be within the scope of this EAL. This IC addresses a hazardous event that causes damage to at least one train of a system needed for spent fuel cooling. The damage must be of sufficient magnitude that the system(s) train cannot, or potentially cannot, perform its design function. This condition reduces the margin to a loss or potential loss of the fuel clad barrier, and therefore represents a potential degradation of the level of safety of the facility. The term "SAFETY SYSTEM" was replaced with "system," as the term is not applicable in the permanently shutdown and defueled condition. The IC language continues to focus on a hazardous event affecting equipment necessary for spent fuel cooling.

The licensee added "extreme high or low tides" as a site-specific hazard, which is consistent with the developer notes in NEI 99-01, Revision 6, that the EAL developers should consider other significant site-specific hazards (e.g., a seiche).

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.2.4 EAL PD-HU3 [PD-HU3], "Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Unusual Event"

This EAL is based upon providing EALs to consider when the decision-maker's judgment deems an emergency classification is warranted, based on the definition and intent of the emergency classification level.

The NRC staff verified that the Oyster Creek implementation of this EAL is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6, and the licensee made no site-specific changes to the generic EAL scheme.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.2.5 EAL PD-HA3 [PD-HA3], "Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert"

This EAL is based upon providing EALs to consider when the decision-maker's judgment deems an emergency classification is warranted, based on the definition and intent of the emergency classification level.

The NRC staff verified that the Oyster Creek implementation of this EAL is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6, and the licensee made no site-specific changes to the generic EAL scheme.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.3 Category "PD-S": System Malfunction

4.2.3.1 EAL PD-SU1 [PD-SU1], "UNPLANNED spent fuel pool temperature rise"

This EAL is based upon a loss of the ability to maintain SFP cooling. If uncorrected, boiling could occur, and result in a loss of water inventory and increased radiation levels.

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific change identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific change to the generic EAL scheme:

- UNPLANNED Spent Fuel Pool temperature rise to > 125°F.

This IC addresses a condition that is a precursor to a more serious event and represents a potential degradation in the level of safety of the facility. If uncorrected, boiling in the pool will occur, and result in a loss of pool level and increased radiation levels. Whenever irradiated (spent) fuel is stored in the SFP, the pool water temperature shall be maintained below 125 degrees Fahrenheit (°F) (per Oyster Creek technical specifications).

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.2.4 Category "E": ISFSI Malfunction

4.2.4.1 E-HU1 [E-HU1], "Damage to a loaded cask CONFINEMENT BOUNDARY"

This EAL addresses an event that results in damage to the confinement boundary of a storage cask containing spent fuel. It applies to irradiated fuel that is licensed for dry storage beginning at the point that the loaded storage cask is sealed. The issues of concern are the creation of a potential or actual release path to the environment; degradation of one or more fuel assemblies due to environmental factors; and configuration changes, which could cause challenges in removing the cask or fuel from storage.

A spent fuel storage license contains technical requirements and operating conditions (fuel specifications, cask leak testing, surveillance, and other requirements) for the ISFSI and specifies what the licensee is authorized to store at the site.

The NRC staff verified that the Oyster Creek implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Section 8 to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Included the site-specific technical specification values of:
  - > 1400 mRem/hr (gamma + neutron) on the Horizontal Storage Module (HSM) front surface (applicable to type 1 61BTH DSC only) OR
  - > 800 mRem/hr (gamma + neutron) 3 feet from the HSM surface (applicable to 61BT DSC only) OR
  - > 200 mRem /hr (gamma + neutron) outside the HSM door on centerline of DSC OR
  - > 40 mRem (gamma + neutron) end of shield wall exterior.

The licensee provided the values that are two times the site-specific cask-specific technical specification allowable radiation level. The developer notes in NEI 99-01, Revision 6, provide that the allowable radiation level for a spent fuel cask is a radiation reading two times the cask's technical specification level located in the Certificate of Compliance.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 4.2 of this safety evaluation), and meets the planning standard of 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

4.3 Conclusions

4.3.1 Emergency Plan Conclusions

Based on the NRC staff's review of the proposed Oyster Creek PDEP, as described in Section 4.1 of this safety evaluation, the NRC staff finds that the proposed PDEP meets the planning standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted, and provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the facility after docketing the certification of permanent fuel removal from the reactor vessel, which occurred on September 25, 2018. Therefore, the NRC staff concludes that the licensee's proposed Oyster Creek PDEP, as provided in Attachment 3 to the licensee's letter dated February 13, 2018, is acceptable.

4.3.2 Emergency Action Level Scheme Conclusions

The NRC staff has reviewed the technical basis for the proposed EAL scheme for Oyster Creek in the permanently shutdown and defueled condition, the modifications from NEI 99-01, Revision 6, and the licensee's evaluation of the proposed changes. Exelon chose, in part, to

modify its EAL scheme from the generic EAL scheme development guidance provided in NEI 99-01, Revision 6, in order to adopt a format more in alignment with its currently approved EAL scheme, as well as alignment with licensee-specific writer's guides and preferences. The NRC staff determined that these modifications are administrative in nature and do not alter the intent of any specific EAL within an EAL, EAL category, or within the entire EAL scheme as stated in NEI 99-01, Revision 6.

The NRC staff determined that the proposed EAL scheme uses objective and observable values, is worded in a manner that addresses human factors engineering and user friendliness concerns, follows logical progression for escalating events, and allows for event downgrading and upgrading based upon the potential risk to the public health and safety. Risk assessments were appropriately used to set the boundaries of the emergency classification levels and ensure that all EALs that trigger emergency classification are in the same range of relative risk.

Based on the above, and the NRC staff's review, as described in Section 4.2 of this safety evaluation, the NRC staff has determined that the proposed changes meet the guidance in NEI 99-01, Revision 6; the planning standard of 10 CFR 50.47(b)(4), and the requirements in Section IV.B to Appendix E of 10 CFR Part 50, as exempted for Oyster Creek. Therefore, the NRC staff concludes that the proposed EAL scheme, as provided in Attachment 3 of the licensee's letter dated August 29, 2017, is acceptable, and provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersey State official was notified of the proposed issuance of the amendment on August 9, 2018. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment relates, in part, to changes in recordkeeping, reporting, or administrative procedures or requirements. The amendment also relates, in part, to changing requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 because the amendment approves an acceptable EAL scheme which is required for operation of the facility. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding published in the *Federal Register* on October 24, 2017 (82 FR 59238). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and 51.22(c)(10). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

8.0 REFERENCES

1. Gallagher, M. P., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "License Amendment Request - Proposed Changes to the Oyster Creek Emergency Plan for Permanently Defueled Emergency Plan and Emergency Action Level Scheme," dated August 29, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17241A065).

2. Gallagher, M. P., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information (RAI) and Supplemental Regarding License Amendment Request – Proposed Changes to the Oyster Creek Emergency Plan for Permanently Defueled Emergency Plan and Emergency Action Level Scheme," dated February 13, 2018 (ADAMS Accession No. ML18044A214).

3. Nuclear Energy Institute, NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," November 2012 (ADAMS Accession No. ML12326A805).

4. Gallagher, M. P., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E," dated August 22, 2017 (ADAMS Accession No. ML17234A082).

5. Gallagher, M. P., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information (RAI) Regarding Request for Exemption from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E," dated December 6, 2017 (ADAMS Accession No. ML17340A708).

6. Gallagher, M. P., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "Supplement to Request for Exemption from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E," dated January 23, 2018 (ADAMS Accession No. ML18023A138).

7. Barstow, J., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "Supplement to Request for Exemption from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E," dated March 8, 2018 (ADAMS Accession No. ML18067A087).

8. Gallagher, M. P., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information (RAI) Related to Exemption Request from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E," dated March 19, 2018 (ADAMS Accession No. ML18078A146).

9. Jury, K. R., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "Permanent Cessation of Operations at Oyster Creek Nuclear Generating Station," dated January 7, 2011 (ADAMS Accession No. ML110070507).

10. Gallagher, M. P., Exelon Generation Company, LLC, letter to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations for Oyster Creek Nuclear Generating Station," dated February 14, 2018 (ADAMS Accession No. ML18045A084).

11. Lamb, J. G., U.S. Nuclear Regulatory Commission, letter to Bryan C. Hanson, Exelon Generation Company, LLC, "Oyster Creek Nuclear Generating Station – Exemptions from Certain Emergency Planning Requirements and Related Safety Evaluation (CAC No. MG0160; EPID L-2017-LLA-0307," dated October 16, 2018 (ADAMS Accession No. ML18220A980).

12. U.S. Environmental Protection Agency, EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," dated October 1991 (reprinted May 1992).

13. Federal Emergency Management Agency Comprehensive Preparedness Guide 101, "Developing and Maintaining Emergency Operations Plans," Version 2.0, November 2010 (http://www.fema.gov/pdf/about/divisions/npd/CPG_101_V2.pdf).

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Principal Contributor: Jeannette Arce, NSIR/DPR

Date: October 17, 2018

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION - ISSUANCE OF AMENDMENT RE: CHANGES TO THE EMERGENCY PLAN FOR PERMANENTLY DEFUELED EMERGENCY PLAN AND EMERGENCY ACTION LEVEL SCHEME (CAC NO. MG0160; EPID L-2017-LLA-0307) DATED OCTOBER 17, 2018

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