



**Michael P. Gallagher**  
Exelon Nuclear  
Vice President  
License Renewal and Decommissioning

200 Exelon Way  
Kennett Square, PA 19348

610 765 5958 Office  
610 765 5658 Fax  
www.exeloncorp.com

michaelp.gallagher@exeloncorp.com

10 CFR 50.90  
10 CFR 50.54(q)

RA-17-049

August 29, 2017

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Oyster Creek Nuclear Generating Station  
Renewed Facility Operating License No. DPR-16  
NRC Docket Nos. 50-219 and 72-15

**Subject:** License Amendment Request - Proposed Changes to the Oyster Creek  
Emergency Plan for Permanently Defueled Emergency Plan and Emergency  
Action Level Scheme

- Reference:**
1. Letter from Keith R. Jury, (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission - "Permanent Cessation of Operations at Oyster Creek Nuclear Generating Station," dated January 7, 2011, RA-11-007 (ML110070507)
  2. Letter from Michael P. Gallagher, (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission – "License Amendment Request - Proposed Changes to the Oyster Creek Emergency Plan for Permanently Defueled Condition," dated February 28, 2017 (ML17060A289) (CAC NO. MF9352)
  3. Letter from Michael P. Gallagher, (Exelon Generation Company, LLC) 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 (ML17234A082)

Pursuant to 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC (Exelon) requests an amendment to Renewed Facility Operating License Number DPR-16 for Oyster Creek Nuclear Generating Station (OCNGS). The proposed amendment would revise the site emergency plan (SEP) and Emergency Action Level (EAL) scheme for the permanently defueled condition. The proposed changes are being submitted to the U.S. Nuclear Regulatory Commission (NRC)

for approval prior to implementation, as required under 10 CFR 50.54(q)(4) and 10 CFR Part 50, Appendix E, Section IV.B.2.

By letter dated January 7, 2011 (Reference 1), Exelon certified that OCNGS would permanently cease power operations no later than December 31, 2019, in accordance with 10 CFR 50.82(a)(1)(i). In Reference 2, Exelon submitted proposed changes to the OCNGS Emergency Plan to reduce the minimum required on-shift and Emergency Response Organization (ERO) staffing following the transition from an operating facility to a permanently defueled facility. In Reference 3, Exelon requested exemptions from portions of 10 CFR 50.47 and 10 CFR 50, Appendix E.

The proposed Permanently Defueled Emergency Plan (PDEP) and Permanently Defueled EAL scheme are commensurate with the significantly reduced spectrum of credible accidents that can occur in the permanently defueled condition and are necessary to properly reflect the conditions of the facility while continuing to preserve the OCNGS Decommissioning Trust Fund and the effectiveness of the emergency plan.

The proposed PDEP and Permanently Defueled EAL scheme are predicated on approval of requests for exemptions from portions of 10 CFR 50.47(b), 10 CFR 50.47(c)(2) and 10 CFR Part 50, Appendix E, Section IV, previously submitted in Reference 3. The proposed PDEP reduces the scope of offsite and onsite emergency planning commensurate with the permanently defueled condition. Additionally, the proposed PDEP states that notification of an emergency declaration will be made to State authorities within 60 minutes after the availability of indications to operators that an EAL threshold has been reached. The proposed PDEP and Permanently Defueled EAL scheme satisfy the applicable standards of 10 CFR 50.47(b) and the requirements of 10 CFR Part 50, Appendix E for a permanently defueled reactor, exempted as requested per Reference 3.

Reference 3 includes an analysis that shows that 12 months following shutdown of the OCNGS reactor, the spent fuel stored in the spent fuel pool will have decayed to the point where the requested exemptions, PDEP, and Permanently Defueled EAL scheme may be implemented without additional compensatory actions. Following the final OCNGS shutdown, which is expected to occur by the end of 2019 (Reference 1), 12 months after shutdown will occur in January 2021.

The proposed changes have been evaluated in accordance with 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c), and Exelon has determined that this change involves no significant hazards consideration. Exelon has also determined that the proposed SEP changes satisfy the criteria for categorical exclusion in accordance with 10 CFR 51.22(c)(9) and do not require an environmental review. Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is required.

The description, technical and regulatory evaluation, significant hazards determination, and environmental considerations evaluation for the proposed amendment are contained in Attachment 1. Attachment 2 provides the proposed PDEP. Attachment 3 provides the Permanently Defueled EALs and Bases Document. Attachment 4 provides a comparison of

the proposed Permanently Defueled EAL Bases Document to the corresponding information contained in NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6. Attachment 5 contains correspondence with the State of New Jersey regarding the proposed changes

In support of this license amendment and the associated exemption for the PDEP, numerous discussions, both electronic and in person, have been held with the cognizant state (New Jersey) and local response organizations. On June 30, 2017, the New Jersey Department of Environmental Protection Bureau of Nuclear Engineering (BNE) met with the OCNGS Decommissioning Transition Organization to review emergency planning during the permanently defueled decommissioning phase. A draft copy of the Permanently Defueled Emergency Plan was provided to the BNE on July 28, 2017. On August 21, 2017, the BNE provided comments on the PDEP and associated EALs via electronic mail. A meeting was held with the BNE in Trenton, NJ, on August 25, 2017, to review all responses to the BNE comments. Attachment 5 contains a letter from the BNE confirming that BNE completed its review of the OCNGS LAR and Exelon's response to the BNE's questions, concerns, and requests.

Exelon requests review and approval of the proposed license amendment by February 28, 2019, and a 60-day implementation period from the effective date of the amendment. Exelon requests that the approved amendment become effective 12 months following the docketing of the certifications required by 10 CFR 50.82(a)(1) that OCNGS has been permanently shutdown and defueled. Once effective, implementation will occur within the 60 days, as noted, but will not exceed March 28, 2021. Approval of these changes by February 28, 2019 will allow OCNGS adequate time to implement the changes to the emergency plan and EAL Scheme by the requested effective date.

In accordance with 10 CFR 50.91 "Notice for public comment; State consultation" paragraph (b), Exelon is notifying the State of New Jersey of this application for license amendment by transmitting a copy of this letter and its attachments to the designated State Official.

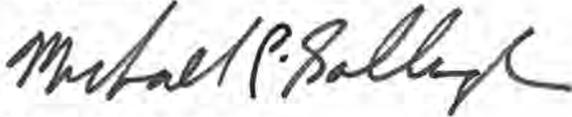
This letter contains no new regulatory commitments.

If you have any questions concerning this submittal, please contact Paul Bonnett at (610) 765-5264.

U.S. Nuclear Regulatory Commission  
OCNGS Proposed Changes to the Emergency Plan  
Docket Nos. 50-219 and 72-15  
August 29, 2017  
Page 4

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 29<sup>th</sup> day of August 2017.

Respectfully,



Michael P. Gallagher  
Vice President, License Renewal & Decommissioning  
Exelon Generation Company, LLC

- Attachments:
1. Description and Evaluation of Proposed Changes
  2. Permanently Defueled Emergency Plan
  3. Permanently Defueled Emergency Action Levels and Bases Document
  4. Comparison Matrix for Permanently Defueled EALs Based on NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6
  5. Correspondence with the State of New Jersey Regarding The Permanently Defueled Emergency Plan

cc: w/Attachments

Regional Administrator - NRC Region I  
NRC Senior Resident Inspector - Oyster Creek Nuclear Generating Station  
NRC Project Manager, NRR - Oyster Creek Nuclear Generating Station  
Director, Bureau of Nuclear Engineering - New Jersey Department of Environmental Protection  
Mayor of Lacey Township, Forked River, NJ

**Attachment 1**

**OYSTER CREEK NUCLEAR GENERATING STATION**

**DOCKET NUMBERS 50-219 & 72-15**

**LICENSE NUMBER DPR-16**

**DESCRIPTION AND EVALUATION OF PROPOSED CHANGES**

**Attachment 1**

**License Amendment Request**

**Oyster Creek Nuclear Generating Station**

**Docket No. 50-219**

**EVALUATION OF PROPOSED CHANGES**

**Subject: Permanently Defueled Emergency Plan and Emergency Action Level Scheme**

**1.0 SUMMARY DESCRIPTION**

**2.0 PROPOSED CHANGES**

**3.0 REASON FOR PROPOSED CHANGES**

**4.0 BACKGROUND**

**5.0 TECHNICAL EVALUATION**

5.1 Accident Analysis Overview

5.2 Consequences of Design Basis Events

5.3 Consequences of Beyond Design Basis Events

5.4 Consequences of Other Analyzed Events

5.5 Comparison to NUREG-1738 Industry Decommissioning Commitments and Staff Decommissioning Assumptions

5.6 Consequences of a Beyond Design Basis Earthquake

5.7 Permanently Defueled Emergency Plan

5.8 Permanently Defueled Emergency Action Levels

5.9 Summary

**6.0 REGULATORY EVALUATION**

6.1 Applicable Regulatory Requirements and Guidance

6.2 Precedent

6.3 No Significant Hazards Consideration Determination

6.4 Conclusion

**7.0 ENVIRONMENTAL CONSIDERATIONS**

**8.0 REFERENCES**

## **1.0 SUMMARY DESCRIPTION**

This evaluation supports a request to amend the Renewed Facility Operating License DPR-16 for Oyster Creek Nuclear Generating Station (OCNGS).

The proposed changes would revise the OCNGS Emergency Plan and Emergency Action Level (EAL) scheme to support the permanent cessation of power operations and permanent removal of fuel from the reactor vessel. This request contains the proposed OCNGS Permanently Defueled Emergency Plan (PDEP) and the Permanently Defueled Emergency Action Level (EAL) scheme for NRC review and approval.

The proposed PDEP and Permanently Defueled EAL scheme satisfy the applicable standards of 10 CFR 50.47(b) and the requirements of 10 CFR Part 50, Appendix E for a permanently defueled reactor, as exempted. Exelon has submitted a separate request for exemptions from portions of 10 CFR 50.47(b); 10 CFR 50.47(c)(2); and 10 CFR Part 50, Appendix E by letter dated August 22, 2017 (Reference 1). Reference 1 contained an analysis that demonstrated that 12 months after permanent cessation of power operations, the spent fuel stored in the spent fuel pool (SFP) will have decayed to the extent that the requested exemptions, PDEP, and Permanently Defueled EAL scheme may be implemented without any additional compensatory actions. OCNGS will permanently shut down by December 31, 2019 (Reference 2), therefore, dated after permanent cessation of power operations will occur on January 2, 2021.

Based on approval of the previously submitted requests for exemption (Reference 1), the proposed PDEP meets the applicable standards of 10 CFR 50.47(b) and requirements of 10 CFR Part 50, Appendix E for a permanently defueled reactor.

## **2.0 PROPOSED CHANGES**

The proposed amendment would modify the OCNGS license by revising the Site Emergency Plan (SEP) and the associated EAL scheme to reflect the pending permanent cessation of operation and permanent defueling of the OCNGS reactor at the end of the current operating cycle and anticipated conditions following 12 months of decay of the spent fuel in the SFP. In a permanently defueled condition, the number and severity of potential radiological accidents is significantly less than when the plant is operating.

Therefore, the offsite radiological consequences of accidents possible at OCNGS are substantially lower. The analyses of the potential radiological impact of accidents while the plant is in a permanently defueled condition indicate that no design basis accident or reasonably conceivable beyond design basis accident will be expected to result in radioactive releases that exceed U.S. Environmental Protection Agency (EPA) Protective Action Guidelines (PAGs) (Reference 5) beyond the site boundary. Exelon will maintain the version of the EPA PAG as specified in the current and proposed OCNGS Emergency Plan. The slow progression rate of postulated event scenarios indicates sufficient time is available to initiate appropriate mitigating actions to protect the health and safety of the public (Reference 1). Therefore, the proposed PDEP states that notification of an emergency declaration will be made to State authorities within 60 minutes after the availability of indications to operators that an EAL threshold has been reached. The proposed PDEP reduces the scope of offsite and onsite emergency planning commensurate with the spectrum of credible accidents that can occur in a permanently defueled condition. The proposed PDEP meets the applicable standards of 10 CFR 50.47(b) and

requirements of 10 CFR Part 50, Appendix E, considering the previously submitted requests for exemption (Reference 1).

The current EAL scheme is based on the guidance presented in NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6, (Reference 3) endorsed by the NRC in a letter dated March 28, 2013 (Reference 4). Exelon determined that a revision to the EAL scheme to implement the EAL scheme contained in Appendix C of NEI 99-01, Rev. 6 (Reference 3), Recognition Category PD (Permanently Defueled), is appropriate for the permanently defueled conditions, as a result of the supporting analyses presented in Reference 1. The EAL associated with the Independent Spent Fuel Storage Installation (ISFSI) in Recognition Category "E" will continue to be used and remains unchanged.

### **3.0 REASON FOR PROPOSED CHANGES**

The proposed changes are necessary to reflect the pending permanent cessation of operation and permanent defueling of the OCNCS reactor at the end of the current operating cycle and anticipated conditions following 12 months of decay of the spent fuel in the SFP. After the reactor is shut down, all fuel assemblies will be removed from the reactor vessel and placed in the SFP. The irradiated fuel will be stored in the SFP and in the ISFSI until it is shipped off-site in accordance with the schedules that will be described in the Post-Shutdown Decommissioning Activities Report (PSDAR) and updated Irradiated Fuel Management Plan.

The proposed revisions to the SEP and EAL scheme are commensurate with the reduction in radiological hazards associated with the permanently defueled condition and will allow the facility to transition to an emergency plan and EAL scheme developed for a permanently defueled facility. The proposed changes are necessary to properly reflect the conditions of the facility 12 months following shutdown while continuing to maintain the effectiveness of the emergency plan and preserve the OCNCS Decommissioning Trust Fund.

### **4.0 BACKGROUND**

OCNCS site is 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. OCNCS is about two miles inland from the shore of Barnegat Bay and seven miles west northwest of Barnegat Light on the Atlantic shorefront. The site is approximately nine miles south of Toms River, New Jersey, about fifty miles east of Philadelphia, Pennsylvania, and sixty miles south of Newark, New Jersey. Exelon owns approximately 708 acres of property to the east of Route 9 extending to the Barnegat Bay. Water access to the site is provided by the Intercostal Waterway, which runs through Barnegat Bay.

Section 15 of the OCNCS Updated Final Safety Analysis Report (UFSAR) describes the design basis accident (DBA) scenarios that are applicable to OCNCS. Many of the accident scenarios postulated in the UFSAR for operating power reactors involve failures or malfunctions of systems, which could affect the fuel in the reactor vessel, which in the most severe postulated accidents, would involve the release of large quantities of fission products. With the termination of reactor operations and the permanent removal of fuel from the reactor vessel, such accidents are no longer possible. Therefore, the postulated accidents involving failure or malfunction of the reactor, reactor cooling system, steam system, or turbine generator are no longer applicable.

In accordance with the New Jersey Department of Environmental Protection's Administrative Order No. 2011-06 (Reference 28), OCNGS will submit a Post-Shutdown Decommissioning Activities Report (PSDAR) by December 31, 2018, which will identify the selected method of decommissioning for OCNGS. By December 31, 2019, the OCNGS reactor will be permanently shut down. After the reactor is shut down, all fuel assemblies will be removed from the reactor vessel and placed in the SFP. The irradiated fuel will be stored in the SFP and the ISFSI until it is shipped off-site in accordance with the schedules described in the PSDAR and updated Irradiated Fuel Management Plan.

With the reactor defueled, the reactor vessel assembly and supporting structures and systems are no longer in operation and have no function related to the safe storage and management of irradiated fuel. A SFP cooling system is provided to remove decay heat from spent fuel stored in the SFP and to maintain a specified water temperature and level.

## **5.0 TECHNICAL EVALUATION**

### **5.1 Accident Analysis Overview**

Following the cessation of reactor operations at OCNGS and the permanent removal of the fuel from the reactor vessel, the postulated accidents involving failure or malfunction of the reactor and supporting structures, systems and components will no longer be applicable. A summary of the postulated radiological accidents analyzed for the permanently shutdown and defueled condition of OCNGS is presented below. Section 5.0 of Interim Staff Guidance (ISG) - 02 (Reference 6) indicates that site-specific analyses should demonstrate that: (1) the radiological consequences of the remaining applicable postulated accidents would not exceed the limits of the EPA PAGs at the Exclusion Area Boundary (EAB); (2) in the event of a beyond design basis event resulting in the partial drain down of the SFP to the point that cooling is not effective, there is at least 10 hours (assuming an adiabatic heat-up) from the time that the fuel is no longer being cooled until the hottest fuel assembly reaches 900 degrees Celsius (°C); (3) adequate physical security is in place to assure implementation of security strategies that protect against spent fuel sabotage; and (4) in the unlikely event of a beyond design basis event resulting in a loss of all SFP cooling, there is sufficient time to implement pre-planned mitigation measures to provide makeup or spray to the SFP before the onset of a zirconium cladding ignition.

OCNGS described these analyses and provided each for NRC review in Reference 1. The specific analyses are summarized in the following sections.

### **5.2 Consequences of Design Basis Events**

#### **Fuel Handling Accident**

The postulated design basis accident that will remain applicable to OCNGS in its permanently shut down and defueled condition is the Fuel Handling Accident (FHA) in the Reactor Building where the SFP is located. An analysis based on the FHA was performed to determine the dose to operators in the control room and the public at the Exclusion Area Boundary (EAB or "Site Boundary") as a function of time after shutdown. The analysis shows that the dose at the EAB 33 days after shutdown (with no credit for containment) is less than 1 rem Total Effective Dose Equivalent (TEDE) and 5 rem Thyroid, which are the EPA PAG thresholds for recommended evacuation based on the calculation in Reference 7. Due to the amount of decay assumed (33 days), the results of this analysis may be applied

after February 2, 2020, assuming a OCNGS shutdown by December 31, 2019. The analysis was submitted for NRC review in Reference 1.

### **5.3 Consequences of Beyond Design Basis Events**

#### **Hottest Fuel Assembly Adiabatic Heat -Up - Beyond Design Basis Event**

The analysis provided in Reference 1 compares the conditions for the hottest fuel assembly stored in the OCNGS SFP to a criterion proposed in SECY-99-168, "Improving Decommissioning Regulations for Nuclear Power Plants" (Reference 8), applicable to offsite emergency response for the unit in the decommissioning process. This criterion considers the time for the hottest assembly to heat-up from 30 degrees Celsius (°C) to 900°C adiabatically. If the heat-up time is greater than 10 hours, then offsite emergency preplanning involving the facility is not necessary.

Based on the limiting fuel assembly for decay heat and adiabatic heat-up analysis, at 12 months after permanent cessation of power operations (12 months decay time), the time for the hottest fuel assembly to reach 900°C is 10 hours after the assemblies have been uncovered. As stated in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants" (February 2001) (Reference 9), 900°C is an acceptable temperature to use for assessing onset of fission product release under transient conditions (to establish the critical decay time for determining availability of 10 hours to evacuate) if fuel and cladding oxidation occurs in air.

Because of the length of time it would take for the adiabatic heat-up to occur, there is ample time to respond to any partial drain down event that might cause such an occurrence by restoring SFP cooling or makeup. As a result, the likelihood that such a scenario would progress to a zirconium fire is not deemed credible. The analysis was submitted for NRC review in Reference 1.

### **5.4 Consequences of Other Analyzed Events**

#### **Loss of Spent Fuel Pool Normal Cooling**

OCNGS analyzed a drain down event of the SFP to determine a dose rate curve at the EAB and Control Room. NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," (Reference 10), Supplement 1, Section 4.3.9, identifies that a SFP drain down event is a beyond design basis event. Although Calculation C-1302-226-E310-457, "Oyster Creek Nuclear Generating Station Zirconium Fire Analysis for Drained Spent Fuel Pool" (Reference 11), demonstrated a significant release of radioactive material from the spent fuel is not possible in the absence of water cooling after 365 days (1 year) following permanent cessation of power operations, the potential exists for radiation exposure to an offsite individual in the event that shielding of the fuel is lost. The SFP water and the concrete pool structure serve as radiation shielding. A loss of water shielding above the fuel could increase the offsite radiation levels because of the gamma rays streaming up out of the SFP being scattered back to a receptor at the site boundary. The offsite and Control Room radiological impacts of a postulated complete loss of SFP water were assessed in Calculation C-1302-226-E310-458, "Dose at Exclusion Area Boundary and Control Room Due to Shine from Drained Spent Fuel Pool During SAFSTOR" (Reference 12). It was determined that the gamma radiation dose rate at the EAB would be limited to small fractions of the EPA PAGs. The EPA PAGs were developed to respond to a mobile airborne plume that could transport and deposit radioactive material over a large area. In contrast, the radiation field formed by gamma scatter

from a drained SFP would be stationary rather than moving and would not cause transport or deposition of radioactive materials. The extended period required to exceed the EPA PAG limit of 1 Rem TEDE would allow sufficient time to develop and implement onsite mitigative actions and provide confidence that additional offsite measures could be taken without planning if efforts to reestablish shielding over the fuel are delayed. The analysis was submitted for NRC review in Reference 1.

### **5.5 Comparison to NUREG-1738 Industry Decommissioning Commitments and Staff Decommissioning Assumptions**

Although the limited scope of design and beyond design basis accidents that remain applicable to OCNCS justify a reduction in the necessary scope of emergency response capabilities, Exelon also evaluated the industry decommissioning commitments (IDCs) and staff decommissioning assumptions (SDAs) contained in NUREG-1738 (Reference 9).

NUREG-1738 contains the results of the NRC staff's evaluation of the potential accident risk in SFPs at decommissioning plants in the United States. As stated therein, the study was undertaken to support development of a risk-informed technical basis for reviewing exemption requests and a regulatory framework for integrated rulemaking. The NRC staff performed analyses and sensitivity studies on evacuation timing to assess the risk significance of relaxed offsite emergency preparedness requirements during decommissioning. The NRC staff based its sensitivity assessment on the guidance in Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (Reference 13). The NRC staff's analyses and conclusions apply to decommissioning facilities with SFPs that meet the design and operational characteristics assumed in the risk analysis.

The NUREG-1738 study found that the risk at decommissioning plants is low and well within the Commission's Safety Goals. The risk is low because of the very low likelihood of a zirconium fire (resulting from a postulated irrecoverable loss of SFP cooling water inventory) even though the consequences from a zirconium fire could be serious.

The study provided the following assessment:

*"The staff found that the event sequences important to risk at decommissioning plants are limited to large earthquakes and cask drop events. For emergency planning (EP) assessments, this is an important difference relative to operating plants where typically a large number of different sequences make significant contributions to risk. Relaxation of offsite EP a few months after shutdown resulted in only a "small change" in risk, consistent with the guidance of RG 1.174. Figures ES-1 and ES-2 [in NUREG-1738] illustrate this finding. The change in risk due to relaxation of offsite EP is small because the overall risk is low, and because even under current EP requirements, EP was judged to have marginal impact on evacuation effectiveness in the severe earthquakes that dominate SFP risk. All other sequences including cask drops (for which emergency planning is expected to be more effective) are too low in likelihood to have a significant impact on risk. For comparison, at operating reactors, additional risk-significant accidents for which EP is expected to provide dose savings are on the order of  $1 \times 10^{-5}$  per year, while for decommissioning facilities, the largest contributor for which EP would provide dose savings is about two orders of magnitude lower (cask drop sequence at  $2 \times 10^{-7}$  per year)."*

The Executive Summary in NUREG-1738 states, in part,

*"... the staff's analyses and conclusions apply to decommissioning facilities with SFPs that meet the design and operational characteristics assumed in the risk analysis. These characteristics are identified in the study as IDCs and SDAs. Provisions for confirmation of these characteristics would need to be an integral part of rulemaking."*

The IDCs and SDAs are listed in Tables 4.1-1 and 4.1-2, respectively, of NUREG-1738. Tables 4 and 5 of Exelon's previous EP exemption request (Reference 1, Attachment 1), identify how the OCNCS SFP meets or compares with each of these IDCs and SDAs.

## **5.6 Consequences of a Beyond Design Basis Earthquake**

NUREG-1738 (Reference 9) identifies beyond design basis seismic events as the dominant contributor to events that could result in a loss of SFP coolant that uncovers fuel for plants in the Central and Eastern United States. Additionally, NUREG-1738 identifies a zirconium fire resulting from a substantial loss-of-water inventory from the SFP, as the only postulated scenario at a decommissioning plant that could result in a significant offsite radiological release. The scenarios that lead to this condition have very low frequencies of occurrence (i.e., on the order of one to tens of times in a million years) and are considered beyond design basis events because the SFP and attached systems are designed to prevent a substantial loss of coolant inventory under accident conditions. However, the consequences of such accidents could potentially lead to an offsite radiological dose in excess of the EPA PAGs (Reference 55) at the EAB.

However, the risk associated with zirconium cladding fire events decreases as the spent fuel ages, decay time increases, decay heat decreases, and short-lived radionuclides decay away. As decay time increases, the overall risk of a zirconium cladding fire continues to decrease due to two factors: (1) the amount of time available for preventative actions increases, which reduces the probability that the actions would not be successful; and (2) the increased likelihood that the fuel is able to be cooled by air, which decreases the reliance on actions to prevent a zirconium fire. The results of research conducted for NUREG-1738 (Reference 9) and NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor" (Reference 14), suggest that, while other radiological consequences can be extensive, a postulated accident scenario leading to a SFP zirconium fire, where the fuel has had significant decay time, will have little potential to cause offsite early fatalities, regardless of the type of offsite response (i.e., formal offsite radiological emergency preparedness plan or Comprehensive Emergency Management Plan).

The purpose of NUREG-2161 (Reference 14) was to determine if accelerated transfer of older, colder spent fuel from the SFP at a reference plant to dry cask storage significantly reduces the risks to public health and safety. The study states, in part that:

*"... this study's results are consistent with earlier research studies' conclusions that spent fuel pools are robust structures that are likely to withstand severe earthquakes without leaking cooling water and potentially uncovering the spent fuel. The study shows the likelihood of a radiological release from the spent fuel after the analyzed severe earthquake at the reference plant to be about one time in 10 million years or lower. If a leak and radiological release were to occur, this study shows that the individual cancer fatality risk for a member of the public is several orders of magnitude lower than the Commission's Quantitative Health*

*Objective of two in one million ( $2 \times 10^{-6}$ /year). For such a radiological release, this study shows public and environmental effects are generally the same or smaller than earlier studies."*

The reference plant for the study (a General Electric Type 4 BWR with a Mark I containment) generated approximately 3500 MWt and the SFP contained 2844 fuel assemblies. OCNCS was licensed to generate 1930 MWt, and the SFP has the capacity to hold 3035 fuel assemblies. The SFP is expected to contain 2529 fuel assemblies following permanent cessation of power operations and transfer of all fuel from the reactor vessel to the SFP. Based on these differences, the risk and the consequences of an event involving the SFP at OCNCS are lower than those in the NUREG-2161 study.

OCNCS conducted a seismic evaluation in response to a NRC request for information pursuant to 10 CFR 50.54(f) regarding Recommendation 2.1 of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident. The seismic evaluation included all structures including the SFP, and was prepared and submitted for NRC review. The Exelon submittal (Reference 15) documents the seismic evaluation in conformance with NTTF Recommendation 2.1 including the high-confidence-of-low-probability-of-failure (HCLPF) values and the  $1 \times 10^{-5}$  per year hazard level. The NRC staff review of the NTTF submittal, specifically for the SFP evaluation associated with the reevaluated seismic hazard implementing NTTF Recommendation 2.1, is documented in Reference 16. The NRC staff concluded that the assessment was performed consistent with the NRC-endorsed (Reference 17) SFP Evaluation Guidance Report (Reference 18) and provided sufficient information, including the SFP integrity evaluation, to meet the SFP Evaluation Guidance (Item 9 in Enclosure 1 of the NRC's 50.54(f) letter). The OCNCS response to other beyond design basis environmental events are also addressed in Tables 4 and 5 of Exelon's previous EP exemption request (Reference 1).

### **5.7 Permanently Defueled Emergency Plan**

The OCNCS PDEP is provided as Attachment 2 of this submittal for NRC review and approval. The PDEP describes the station's plan for responding to emergencies that may arise at OCNCS while in a permanently shutdown and defueled configuration. The PDEP was developed considering the guidance contained within Attachment 1 of NSIR/DPR-ISG-02, Interim Staff Guidance, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants" (Reference 6).

The analyses of the potential radiological impact of accidents while the facility is in a permanently defueled condition indicate that no design basis accident or reasonably conceivable beyond design basis accident will be expected to result in radioactive releases that exceed EPA PAGs beyond the site boundary. The slow progression rate of postulated event scenarios indicates sufficient time is available to initiate appropriate mitigating actions to protect the health and safety of the public (Reference 1). Therefore, the proposed PDEP states that notification of an emergency declaration will be made to State authorities within 60 minutes after the availability of indications to operators that an EAL threshold has been reached. Based on the results of the accident analysis, a 60-minute notification time and reduced scope of offsite and onsite emergency response plans can be implemented without undue risk to public health and safety, commensurate with the reduced offsite radiological consequences associated with the defueled and decommissioning status of the facility.

In the event of a large area fire, deliberate attack, or other rapidly developing beyond design basis events, the rapid deployment of offsite resources, including law enforcement, ambulance,

and fire/rescue services may be requested by the station to assist with the onsite response. These requests would be made via direct contact with local law enforcement using established communications methods, including the 911 system.

The PDEP addresses the applicable regulations contained in 10 CFR 50.47, "Emergency plans" and 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities" and is consistent with the applicable guidance established in ISG-02 (Reference 6) and NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (Reference 19) that remain applicable after the previously requested exemptions are approved (Reference 1).

## **5.8 Permanently Defueled Emergency Action Levels**

The current OCNCS EAL scheme was developed based on the guidance presented in NEI 99-01, Rev. 6 (Reference 3).

Attachment 3 provides the proposed "Oyster Creek Permanently Defueled Emergency Action Levels and Technical Bases," Rev. 0. This document contains the site-specific EALs and technical bases for the proposed Permanently Defueled EAL scheme.

### **5.8.1 Differences and Deviations**

Attachment 4 provides a cross-reference between each generic EAL contained in NEI 99-01, Revision 6 (Reference 3) and the proposed Permanently Defueled EALs. Differences and deviations are identified in accordance with the guidance contained in NRC Regulatory Issue Summary (RIS) 2003-18, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels, Revision 4, Dated January 2003," (and Supplements 1 and 2) (Reference 20).

As discussed in RIS 2003-18, Supplement 1, differences are defined as follows:

"A *difference* is an EAL change where the basis scheme guidance (NUREG, NUMARC, NEI) differs in wording but agrees in meaning and intent, such that classification of an event would be the same, whether using the basis scheme guidance or the site-specific proposed EAL. Examples of differences include the use of site-specific terminology or administrative reformatting of site-specific EALs."

An explanation for each difference between the Permanently Defueled EALs and the guidance presented in NEI 99-01, Rev. 6 is included in Attachment 4. The differences do not alter the meaning or intent of the Initiating Condition or EAL.

As discussed in RIS 2003-18, Supplement 1, deviations are defined as follows:

"A *deviation* is an EAL change where the basis scheme guidance differs in wording and is altered in meaning or intent, such that classification of the event could be different between the basis scheme guidance and the site-specific proposed EAL. Examples of *deviations* include the use of altered mode applicability, altering key words or time limits, or changing words of physical reference (protected area, safety-related equipment, etc.)."

There are no deviations between the Permanently Defueled EALs and the guidance presented in NEI 99-01, Revision 6.

### **5.8.2 Operating Modes and Applicability**

The proposed Permanently Defueled EALs are only applicable to the permanently defueled condition, with all irradiated fuel permanently removed from the reactor vessel and following 12 months of decay of the spent fuel.

### **5.8.3 State and Local Government Review of Proposed Changes**

Because of the geographic location of OCNGS, emergency planning and responsibilities have historically involved coordination with the State of New Jersey. Decommissioning-related emergency plan submittals for OCNGS have been discussed with offsite response organizations since Exelon provided notification that it would permanently cease power operations.

In support of this license amendment and the associated PDEP and Permanently Defueled EAL scheme, numerous discussions, both electronic and in person, have been held with the New Jersey and local response organizations. On July 28, 2017, the New Jersey Department of Environmental Protection Bureau of Nuclear Engineering (BNE) received the draft proposed changes of the OCNGS Permanently Defueled Emergency Plan and EAL scheme. On August 21, 2017, the BNE provided comments on the PDEP and associated EALs via electronic mail. A meeting was held with the BNE in Trenton, NJ, on August 25, 2017, to review all responses to the BNE comments. Attachment 5 contains a letter from the BNE confirming that BNE completed its review of the OCNGS LAR and Exelon's response to the BNE's questions, concerns, and requests.

Following NRC approval and prior to implementation, OCNGS will provide an overview of the new classification scheme to State and local emergency management officials in accordance with 10 CFR Part 50, Appendix E, Section IV.B.1.

### **5.9 Summary**

On January 7, 2011, Exelon submitted a notification of permanent cessation of power operations pursuant to 10 CFR 50.82(a)(1)(i), stating that Exelon has decided to permanently cease power operation of OCNGS by December 31, 2019 (Reference 2). Upon docketing of the certifications for permanent cessation of operations (10 CFR 50.82(a)(1)(i)) and permanent removal of fuel from the reactor vessel (10 CFR 50.82(a)(1)(ii)), pursuant to 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for OCNGS will no longer authorize operation of the reactor or emplacement or retention of fuel into the reactor vessel.

OCNGS has demonstrated that no postulated accident or reasonably conceivable beyond design basis event will result in radiological releases requiring offsite protective actions, or the slow progression rate of postulated event scenarios indicate sufficient time is available to initiate appropriate mitigating actions to protect the health and safety of the public (Reference 1).

This proposed amendment would revise the emergency plan and the EAL scheme to reflect the permanently defueled condition following 12 months of decay of the spent fuel. The proposed emergency plan and EAL scheme are being submitted to the NRC for approval prior to implementation, as required under 10 CFR 50.54(q)(4) and 10 CFR Part 50, Appendix E, Section IV.B.2, and are predicated on approval of exemptions previously submitted to the NRC (Reference 1).

## 6.0 REGULATORY EVALUATION

The proposed PDEP and Permanently Defueled EAL scheme are predicated on approval of requests for exemptions from portions of 10 CFR 50.47(b); 10 CFR 50.47(c)(2); and 10 CFR Part 50, Appendix E, Section IV, previously submitted in Reference 1, and as such, does not meet all the standards of 10 CFR 50.47(b) and requirements of 10 CFR Part 50, Appendix E. Upon approval of the requested exemptions, the emergency plan, as revised, will meet the remaining applicable requirements in 10 CFR Part 50, Appendix E and the planning standards of 10 CFR 50.47(b).

### 6.1 Applicable Regulatory Requirements and Guidance

Exelon intends to meet the applicable emergency regulatory requirements as discussed below with the exemptions previously requested (Reference 1). The requested exemptions are reflected by "strikeout" text in the discussion below.

10 CFR 50.47, "Emergency plans," sets forth emergency plan requirements for nuclear power plant facilities. The regulations in 10 CFR 50.47(a)(1)(i) state, in part:

"... 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."

10 CFR 50.47(b) 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. Planning Standard (4) of this section (e.g. 10 CFR 50.47(b)(4)) (with exemption) requires that a licensee's emergency response plan contain the following:

"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.~~"

10 CFR 50.54(q)(4) specifies the process for revising emergency plans where the changes reduce the effectiveness of the plan. This regulation states the following:

"The changes to a licensee's emergency plan that reduce the effectiveness of the plan as defined in paragraph (q)(1)(iv) of this section may not be implemented without prior approval by the NRC. A licensee desiring to make such a change after February 21, 2012 shall submit an application for an amendment to its license. In addition to the filing requirements of §§ 50.90 and 50.91, the request must include all emergency plan pages affected by that change and must be accompanied by a forwarding letter identifying the change, the reason for the change, and the basis for concluding that the licensee's emergency plan, as revised, will continue to meet the requirements in appendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b)."

Section IV.B.1 of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, states, in part (with exemption):

"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."~~

Section IV.B.2 of Appendix E states that:

"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."

Section IV.C.1 of Appendix E requires (with exemption) each emergency plan to define the emergency classification levels that determine the extent of the participation of the emergency response organization. EALs are used by plant personnel in determining the appropriate emergency classification level to declare. This section states, in part:

~~"Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as the pressure in containment and the response of the Emergency Core Cooling System) for notification of offsite agencies shall be described. The existence, but not the details, of a message authentication scheme shall be noted for such agencies. "The emergency classes defined shall include: (1) Notification of unusual events, [and] (2) alert, (3) site area emergency, and (4) general emergency."~~

In November 2012, NEI published NEI 99-01, Revision 6 (Reference 3). The EAL scheme changes being requested herein are based on Revision 6 to NEI 99-01. NRC endorsed NEI 99-01, Revision 6, by letter dated March 28, 2013 (Reference 4). The analyses of the potential radiological impact of accidents while the plant is in a permanently defueled condition indicate that no design basis accident or reasonably conceivable beyond design basis accident will be expected to result in radioactive releases that exceed EPA PAGs beyond the site boundary. The slow progression rate of postulated event scenarios indicates sufficient time is available to initiate appropriate mitigating actions to protect the health and safety of the public (Reference 1). Therefore, the Permanently Defueled EALs, detailed in NEI 99-01, Revision 6, will be adopted, with certain differences and deviations. Pursuant to 10 CFR Part 50, Appendix E, Section IV.B.2, a revision to an entire EAL scheme must be approved by the NRC before implementation.

NSIR/DPR-ISG-02, Interim Staff Guidance, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants" (Reference 6) contains guidance for NRC staff evaluation of decommissioning emergency plans.

The proposed amendment is being submitted to the NRC pursuant to 10 CFR 50.90, for the purpose of revising the OCNCS SEP in order to establish an emergency plan appropriate for a permanently defueled facility (e.g., PDEP) and to implement a Permanently Defueled EAL scheme, predicated on approval of the exemptions requested in Reference 1.

## **6.2 Precedent**

The changes to the OCN GS Emergency Plan and associated EAL scheme, including the change to assess, classify, and declare an emergency within 30 minutes, are consistent with changes to emergency plans and EALs for the transition to a permanently defueled condition that have recently been approved by the NRC for other nuclear power reactor facilities beginning decommissioning. Specifically, the NRC approved similar changes to: 1) Entergy Nuclear Operations, Inc. for the Vermont Yankee Nuclear Power Station on December 11, 2015 (Reference 21); 2) Southern California Edison Company for the San Onofre Nuclear Generating Station, Units 1, 2, and 3 on June 5, 2015 (References 22 and 23); 3) Duke Energy Florida, Inc. for the Crystal River Unit 3 Nuclear Generating Station on March 31, 2015 (Reference 24); and 4) Dominion Energy Kewaunee, Inc. for the Kewaunee Power Station on October 31, 2014 (Reference 25).

Similar changes to the emergency plan and the associated EAL scheme were approved by NRC for the Zion Station as it transitioned from an operating plant to a decommissioned facility, as described in References 26 and 27.

## **6.3 No Significant Hazards Consideration Determination**

Pursuant to 10 CFR 50.92, Exelon has reviewed the proposed changes and concludes that the changes do not involve a significant hazards consideration because the proposed changes satisfy the criteria in 10 CFR 50.92(c). These criteria require that operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

The proposed changes would revise the Oyster Creek Nuclear Generating Station (OCNGS) Site Emergency Plan (SEP) and Emergency Action Level (EAL) scheme commensurate with the hazards associated with a permanently defueled facility.

The discussion below addresses each of these criteria and demonstrates that the proposed amendment does not constitute a significant hazard.

### **1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?**

Response: No.

The proposed changes to the emergency plan and EAL scheme do not impact the function of plant structures, systems, or components (SSCs). The proposed changes do not affect accident initiators or precursors, nor does it alter design assumptions. The proposed changes do not prevent the ability of the on-shift staff and emergency response organization (ERO) to perform their intended functions to mitigate the consequences of any accident or event that will be credible in the permanently defueled condition.

The probability of occurrence of previously evaluated accidents is not increased, since most previously analyzed accidents can no longer occur and the probability of the few remaining credible accidents are unaffected by the proposed amendment.

Therefore, the proposed change does not involve a significant increase in the probability

or consequences of an accident previously evaluated.

**2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?**

Response: No.

The proposed changes reduce the scope of the SEP and EAL scheme commensurate with the hazards associated with a permanently shutdown and defueled facility. The proposed changes do not involve installation of new equipment or modification of existing equipment, so that no new equipment failure modes are introduced. In addition, the proposed changes do not result in a change to the way that the equipment or facility is operated so that no new or different kinds of accident initiators are created.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

**3. Does the proposed amendment involve a significant reduction in a margin of safety?**

Response: No.

Margin of safety is associated with confidence in the ability of the fission product barriers (i.e., fuel cladding, reactor coolant system pressure boundary, and containment structure) to limit the level of radiation dose to the public. The proposed changes are associated with the SEP and EAL scheme and do not impact operation of the plant or its response to transients or accidents. The change does not affect the Technical Specifications. The proposed changes do not involve a change in the method of plant operation, and no accident analyses will be affected by the proposed changes. Safety analysis acceptance criteria are not affected by the proposed changes. The Post Defueled Emergency Plan (PDEP) will continue to provide the necessary response staff with the appropriate guidance to protect the health and safety of the public.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Exelon concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

**6.4 Conclusion**

In conclusion, based on the considerations discussed above: 1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, 2) such activities will be conducted in compliance with 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.

**7.0 ENVIRONMENTAL CONSIDERATIONS**

This amendment request meets the eligibility criteria for categorical exclusion from environmental review set forth in 10 CFR 51.22(c)(9) as follows:

**(i) The amendment involves no significant hazards consideration.**

As described in Section 6.3 of this evaluation, the proposed changes involve no significant hazards consideration.

**(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.**

The proposed changes do not involve any physical alterations to the plant configuration or any changes to the operation of the facility that could lead to a change in the type or amount of effluent release offsite.

**(iii) There is no significant increase in individual or cumulative occupational radiation exposure.**

The proposed changes do not involve any physical alterations to the plant configuration or any changes to the operation of the facility that could lead to a significant increase in individual or cumulative occupational radiation exposure.

Based on the above, Exelon concludes that the proposed change meets the eligibility criteria for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

## 8.0 REFERENCES

1. Letter from Michael P. Gallagher, (Exelon Generation Company, LLC) 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 (ML17234A082)
2. Letter from Keith R. Jury, Exelon Generation Company, LLC to U.S. NRC - "Permanent Cessation of Operations at Oyster Creek Nuclear Generating Station," dated January 7, 2011 (ADAMS Accession No. ML110070507)
3. Nuclear Energy Institute (NEI) 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012 (ADAMS Accession No. ML12326A805)
4. Letter, Mark Thaggard (USNRC) to Susan Perkins-Grew (NEI), "U.S. Nuclear Regulatory Commission Review and Endorsement of NEI 99-01, Revision 6, Dated November 2012 (TAC No. D92368)," dated March 28, 2013 (ADAMS Accession No. ML12346A463)
5. 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)
6. NSIR/DPR-ISG-02, Interim Staff Guidance, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," dated May 11, 2015 (ADAMS Accession No. ML14106A057)
7. C-1302-226-E310-460, "EAB, LPZ, and CR Dose Due to Fuel Handling Accident (FHA) -Post Cessation of Power Operations," dated August 9, 2017
8. U.S. Nuclear Regulatory Commission, Commission Paper SECY-99-168, Improving Decommissioning Regulations for Nuclear Power Plants, dated June 30, 1999 (ADAMS Accession No. ML992800087)
9. NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," dated February 2001 (ADAMS Accession No. ML010430066)
10. NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," dated October 2002
11. C-1302-226-E310-457, "Oyster Creek Nuclear Generating Station Zirconium Fire Analysis for Drained Spent Fuel Pool," dated June 19, 2017
12. C-1302-226-E310-458, "Dose at Exclusion Area Boundary and Control Room Due to Shine from Drained Spent Fuel Pool During SAFSTOR," dated June 16, 2017
13. Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis"
14. U.S. Nuclear Regulatory Commission, NUREG-2161, "Consequence Study of a Beyond- Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," dated September 2014 (ADAMS Accession No. ML14255A365)
15. Letter from Mr. James Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Exelon Generation Company, LLC, Seismic Hazard and

- Screening Report (Central and Eastern United States (CEUS) Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 31, 2014 (ADAMS Accession No. ML14090A241)
16. Letter from U.S. Nuclear Regulatory Commission to Mr. Bryan C. Hanson (Exelon Generation Company, LLC), "Oyster Creek Nuclear Generating Station - Staff Assessment of Information Provided Pursuant to Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (CAC NO. MF5257)," dated February 17, 2016 (ADAMS Accession No. ML15350A353)
  17. Letter, Jack R. Davis (USNRC) to Joseph E. Pollock (NEI), "Endorsement of Electric Power Research Institute Report 3002007148, Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation," dated March 17, 2016 (ADAMS Accession No. ML15350A158)
  18. EPRI, "Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation," Electric Power Research Institute Technical Update 3002007148, dated February 2016 (ADAMS Accession No. ML16055A021)
  19. NUREG-0654, FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, published November 1980
  20. NRC Regulatory Issue Summary 2003-18, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels, Revision 4, dated January 2003," dated October 8, 2003 (ADAMS Accession No. ML032580518), and Supplement 1 and 2, respectively dated July 13, 2004 (ADAMS Accession No. ML041550395) and December 12, 2005 (ADAMS Accession No. ML051450482)
  21. Letter, USNRC to Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station, "Vermont Yankee Nuclear Power Station – Issuance of Amendment Re: Changes to the Emergency Plan and Emergency Action Levels (TAC No. MF4279)," dated December 11, 2015 (ADAMS Accession No. ML15233A166)
  22. Letter, USNRC to San Onofre Nuclear Generating Station, "San Onofre Nuclear Generating Station, Units 1, 2, and 3 and the Independent Spent Fuel Storage Installation – Issuance of Amendments Re: Changes to the Emergency Action Level Scheme (TAC Nos. MF3838, MF3839, MF3840)," dated June 5, 2015 (ADAMS Accession No. ML15105A349)
  23. Letter, USNRC to San Onofre Nuclear Generating Station, "San Onofre Nuclear Generating Station, Units 1, 2, and 3 and the Independent Spent Fuel Storage Installation – Issuance of Amendments Re: Changes to the Emergency Plan (TAC Nos. MF3841, MF3842, MF3843)," dated June 5, 2015 (ADAMS Accession No. ML15126A461)

24. Letter, USNRC to Crystal River Nuclear Plant (NA2C), "Crystal River Unit 3 – Issuance of Amendment Regarding Changes to the Emergency Plan and Emergency Action Levels (TAC No. MF3415)," dated March 31, 2015 (ADAMS Accession No. ML15027A209)
25. Letter, USNRC to Dominion Energy Kewaunee, Inc., "Kewaunee Power Station – Issuance of Amendment for Changes to the Emergency Plan and Emergency Action Levels (TAC No. MF3411)," dated October 31, 2014 (ADAMS Accession No. ML14279A482)
26. Letter, USNRC to Zion Nuclear Power Station, Unit Nos. 1 and 2, "Request for Approval of Defueled Station Emergency Plan and Exemption from Certain Requirements of 10 CFR 50.47, "Emergency Plans"- Zion Nuclear Power Station, Unit Nos. 1 and 2 (TAC NOS MA5253 and MA554)," dated August 31, 1999 (ADAMS Legacy No. 9909070087)
27. Letter, USNRC to Zion Nuclear Power Station, Unit Nos. 1 and 2, "Emergency Action Level Revisions for Zion Nuclear Power Station (TAC Nos. J00327 and J00328)," dated February 25, 2008 (ADAMS Accession No. ML072680350)
28. New Jersey Department of Environmental Protection Administrative Order No. 2011-06, dated May 6, 2011

**Attachment 2**

**OYSTER CREEK NUCLEAR GENERATING STATION**

**DOCKET NUMBERS 50-219 & 72-15**

**LICENSE NUMBER DPR-16**

**PERMANENTLY DEFUELED EMERGENCY PLAN**

**EXELON NUCLEAR  
OYSTER CREEK  
PERMANENTLY DEFUELED  
EMERGENCY PLAN (PDEP)**



**TABLE OF CONTENTS**

<b>Section</b>	<b>Page</b>
<b>1.0 INTRODUCTION .....</b>	<b>1</b>
1.1. Purpose.....	1
1.2. Scope .....	1
<b>2.0 SUMMARY OF EMERGENCY PLAN.....</b>	<b>3</b>
2.1. Overview of Permanently Defueled Emergency Plan.....	3
2.2. Objectives .....	3
2.3. Actions in an Emergency.....	4
2.4. Emergency Response Facilities.....	4
2.5. Mobilization .....	5
2.6. State and Local Government Notification and Response.....	5
2.7. Federal Government Notification and Response.....	5
2.8. Technical Support .....	6
2.9. Mitigation of Consequences of Beyond Design Basis Events .....	6
<b>3.0 SITE DESCRIPTION.....</b>	<b>7</b>
3.1. Facility Description.....	7
3.2. Area Characteristics and Land Use .....	7
<b>4.0 EMERGENCY CLASSIFICATION SYSTEM.....</b>	<b>11</b>
4.1. Unusual Event .....	11
4.2. Alert.....	12
4.3. Emergency Classification System Review by State Authorities.....	12
<b>5.0 EMERGENCY RESPONSE FACILITIES AND EQUIPMENT.....</b>	<b>13</b>
5.1. Control Room .....	13
5.2. Assessment Capability.....	13
<b>6.0 COMMUNICATIONS .....</b>	<b>17</b>
<b>7.0 ORGANIZATION .....</b>	<b>20</b>
7.1. Normal Facility Organization .....	20
7.2. Emergency Response Organization.....	22
7.3. Coordination with State Government Authorities .....	24

**TABLE OF CONTENTS**

<b>Section</b>	<b>Page</b>
<b>8.0 EMERGENCY RESPONSE</b> .....	<b>27</b>
8.1. Emergency Condition Recognition and Classification .....	27
8.2. Activation of the Emergency Response Organization .....	27
8.3. Emergency Termination Criteria.....	29
<b>9.0 RADIOLOGICAL ASSESSMENT AND PROTECTIVE MEASURES</b> .....	<b>31</b>
9.1. Radiological Assessment .....	31
9.2. Radiological Exposure Control .....	31
9.3. Protective Measures .....	31
9.4. Aid to Affected Personnel.....	33
9.5. Protective Actions for Onsite Personnel .....	34
<b>10.0 EMERGENCY NOTIFICATION AND PUBLIC INFORMATION</b> .....	<b>38</b>
10.1. Emergency Notification .....	38
10.2. Public Information.....	38
<b>11.0 MAINTAINING EMERGENCY PREPAREDNESS</b> .....	<b>39</b>
11.1. Drills and Exercises.....	39
11.2. Training .....	42
11.3. Review and Updating of Plan and Procedures.....	43
11.4. Maintenance and Inventory of Emergency Equipment and Supplies .....	43
11.5. Responsibility for the Planning Effort .....	44

**LIST OF TABLES**

Table 7.1: Minimum On-Shift and ERO Staffing Requirements.....	26
Table 9.1: Emergency Dose Limits.....	35

**LIST OF FIGURES**

Figure 3.1: OCNGS Site Arrangement.....	9
Figure 3.2: OCNGS Site Relative Location.....	10
Figure 6.1: Exelon Notification Scheme .....	19
Figure 7.1: Normal On-Shift and Emergency Response Organization.....	25
Figure 8.1: Notification Plan.....	30

**APPENDICES**

- APPENDIX 1    REFERENCES**
- APPENDIX 2    INDEX OF EMERGENCY PLAN IMPLEMENTING PROCEDURES**
- APPENDIX 3    PROCEDURE CROSS REFERENCE TO NUREG-0654**
- APPENDIX 4    LIST OF LETTERS OF AGREEMENT**
- APPENDIX 5    GLOSSARY OF TERMS AND ACRONYMS**

**ADDENDUMS**

- ADDENDUM 1    Oyster Creek Station Permanently Defueled Emergency Action Levels and Technical Bases**

## 1.0 INTRODUCTION

The Permanently Defueled Emergency Plan (PDEP) describes the facility's plan for responding to emergencies that may arise at the Oyster Creek Nuclear Generating Station (OCNGS) while in a permanently shutdown and defueled configuration. Once OCNGS has certified to the Nuclear Regulatory Commission (NRC) that the facility has permanently ceased operations and that all fuel has been permanently removed from the reactor vessel, as required by 10 CFR 50.82(a)(1)(i) and (ii), all irradiated fuel will be stored in the Independent Spent Fuel Storage Installation (ISFSI) and in the Spent Fuel Pool (SFP). In this condition, no reactor operations can take place and the station is prohibited from emplacement or retention of fuel in the reactor vessel. An analysis of the possible design basis events and consequences is presented in the evaluation of the Defueled Safety Analysis Report (DSAR) accident assessment. This PDEP adequately addresses the risks associated with OCNGS's current conditions.

The analysis of the potential radiological impacts of postulated design basis accident in a permanently defueled condition indicates that any releases beyond the Site Boundary would be below the Environmental Protection Agency (EPA) Protective Action Guide (PAG) exposure levels. Additionally, postulated beyond design basis accidents have been analyzed showing that due to their slow progression there is sufficient time available to initiate appropriate mitigating actions to protect the health and safety of the public. Therefore, the PDEP adequately addresses the risk associated with OCNGS's permanently defueled condition and continues to provide adequate protection for facility personnel and the public. Exposure levels, which warrant pre-planned response measures, are limited to onsite areas. For this reason, the OCNGS's PDEP is focused on onsite actions.

### 1.1. Purpose

The purpose of the PDEP is to assure an adequate level of preparedness by which to cope with a spectrum of emergencies that could be postulated to occur, including the means to minimize radiation exposure to facility personnel. This plan integrates the necessary elements to provide effective emergency response considering cooperation and coordination of off-site organizations expected to respond to potential emergencies.

### 1.2. Scope

The PDEP has been developed to respond to potential radiological emergencies at OCNGS considering the permanently shut down and defueled status. Because there are no postulated accidents that would result in dose consequences that are large enough to require offsite emergency planning, the overall scope of this plan delineates the actions necessary to safeguard onsite personnel and minimize damage to property. If determined appropriate by government officials, protective actions may be implemented to protect the public using an all hazards approach to emergency planning.

The concepts presented in this plan address the applicable regulations stipulated in 10 CFR 50.47, "Emergency Plans" and 10 CFR Part 50, Appendix E, "Emergency Planning

and Preparedness for Production and Utilization Facilities," as exempted. Exemptions to selected portions of 10 CFR 50.47(b), 10 CFR 50.47(c)(2) and 10 CFR Part 50, Appendix E were previously approved by the NRC. The plan is consistent with the remaining applicable guidelines established in NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Facilities" (NUREG-0654). Appendix 3 contains a cross-reference to the applicable guidance in NUREG-0654.

Abbreviations and acronyms used in this plan are included in Appendix 5.

## **2.0 SUMMARY OF EMERGENCY PLAN**

### **2.1. Overview of Permanently Defueled Emergency Plan**

In the event of an emergency at OCNCS, actions are required to identify and assess the nature of the emergency and to bring it under control in a manner that protects the health and safety of the public and facility personnel.

This plan describes the organization and responsibilities for implementing emergency measures. It describes interfaces with Federal, State of New Jersey, and local organizations that may be notified in the event of an emergency, and may provide assistance.

Emergency services are provided by local public and private entities. Fire support services are provided by the Forked River or Lanoka Harbor Fire Departments, law enforcement support services are provided by local, state, and federal law enforcement authorities, as appropriate. Ambulance service is provided by Lacey Township and Lanoka Harbor First Aid Squads.

Because there are no postulated accidents that would result in off-site dose consequences that are large enough to require off-site emergency planning, emergencies are divided into two classifications: 1) Notification of Unusual Event (Unusual Event) and 2) Alert. The classification scheme, developed in accordance with NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors", Revision 6, November 2012, has been discussed and agreed upon with responsible offsite organizations and is compatible with their respective emergency plans (CEMP). If determined appropriate by government officials, protective actions may be implemented to protect the public using the existing all hazards emergency planning.

OCNCS is responsible for planning and implementing emergency measures within the site boundary. This plan is provided to meet this responsibility. To carry out specific emergency measures discussed in this plan, detailed emergency plan implementing procedures (EPIP) are established and maintained. A list of EIPs is included in Appendix 2.

In addition to the description of activities and steps that can be implemented during an emergency, this plan also provides a general description of the steps taken to recover from an emergency situation. It also describes the training, drills, planning, and coordination appropriate to maintain an adequate level of emergency preparedness.

### **2.2. Objectives**

The basic objectives of this plan are:

- 1) To establish a system for identification and classification of the emergency condition and initiation of response actions;
- 2) To establish an organization for the direction of activity within the facility to limit the consequences of the incident;
- 3) To establish an organization for control of surveillance activities to assess the extent and significance of any uncontrolled release of radioactive material;
- 4) To identify facilities, equipment and supplies available for emergency use;

- 5) To establish an engineering support organization to aid the facility personnel in limiting the consequences of and recovery from an event;
- 6) To establish the basic elements of an emergency recovery program;
- 7) To specify a system for coordination with federal, state, and local authorities and agencies for offsite support;
- 8) To develop a communications network between the facility and offsite authorities to provide notification of emergency situations;
- 9) To develop a training and Emergency Plan exercise program to assure constant effectiveness of the plan.

### **2.3. Actions in an Emergency**

This plan is activated by the Shift Manager upon identification of an emergency situation based upon Emergency Action Level (EAL) criteria. The emergency measures described in the subsequent sections and emergency plan implementing procedures are implemented in accordance with the classification and nature of the emergency at the direction of the Shift Manager. Regulatory authorities and offsite support organizations are notified in accordance with this plan. The Shift Manager has authority and responsibility for control and mitigation of the emergency, including emergency response resources, coordination of radiological assessment activities, and recovery implementation.

If an emergency condition develops, the Shift Manager assumes the role of Emergency Director, including responsibilities for initiating emergency actions to limit the consequences of the incident and to bring the facility into a stable condition. The individual must:

- 1) Recognize the emergency condition by observation of EALs;
- 2) Classify the accident in accordance with the emergency classification system;
- 3) Initiate emergency procedure(s) applicable to the event;
- 4) Activate the facility emergency alarm system;
- 5) Notify state authorities of emergency conditions;
- 6) Notify the NRC using the Emergency Notification System (ENS);
- 7) Use the notification plan to notify appropriate personnel as set forth in Figure 8.1; and
- 8) Direct and coordinate all emergency response efforts until overall responsibility is assumed by another individual qualified as an Emergency Director.

### **2.4. Emergency Response Facilities**

The emergency response facilities, which are utilized by the Emergency Response Organization (ERO), are described in Section 5.0. Key site personnel are dispatched to perform accident assessments, implement corrective actions, and analyze accident data.

## **2.5. Mobilization**

The mobilization scheme is based on the emergency notification plan and is shown in Figure 8.1. The notification system utilizes the facility public address system, commercial telephone lines, and the ERO notification system to notify and mobilize facility personnel. The mobilization scheme ensures that specific technical disciplines can be augmented within appropriate time frames. On-site staff are informed of an emergency condition through the use of the plant 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 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. 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. Section 7.2, Figure 7.1 and Table 7.1 outline the minimum staffing requirements for the ERO at OCNGS.

## **2.6. State and Local Government Notification and Response**

Notification to the responsible State and County authorities is required within 60 minutes after the availability of indications to operators that an EAL threshold has been reached. The commercial telephone network serves as the primary means to provide emergency notification to State and County agencies. It is used to provide initial and updated notifications and for general information flow between 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.

As part of the State's CEMP, a cooperative arrangement exists among the New Jersey State authorities and OCNGS concerning radiological emergency preparedness. OCNGS's emergency classification system and notification messages are reviewed with the State of New Jersey on an annual basis.

## **2.7. Federal Government Notification and Response**

Notification to the NRC is made using the ENS as soon as possible after State notifications and within 60 minutes of event classification or change in classification. Once notified of an emergency, the NRC evaluates the situation and determines the appropriate NRC response. Depending on the severity of the accident and the emergency classification declared, the NRC activates its incident response operations in accordance with the NRC Incident Response Plan. If the emergency warrants, the NRC notifies the Federal Emergency Management Agency (FEMA) and other appropriate federal agencies to activate the federal emergency response organization in accordance with the National Response Framework (NRF). The NRF makes available the resources and capabilities of federal agencies to support facility, state and local governments, as necessary to respond to the specific nature of the emergency. Principal participants are the NRC, FEMA, Department of Energy (DOE), and Environmental Protection Agency (EPA).

## **2.8. Technical Support**

In the event of an emergency that requires personnel and other support resources beyond those available within the OCNGS organization, augmentation is available from other Exelon facilities and can be requested from various contractors. Additional technical and manpower support are provided to OCNGS through support plans listed in Appendix 2, List of Emergency Plan Implementing Procedures.

## **2.9. Mitigation of Consequences of Beyond Design Basis Events**

Strategies to mitigate a loss of SFP inventory and prevent a zirconium fire are contained within Abnormal Operating Procedure, ABN-16 Loss of Fuel Pool Cooling, EDMG-01, Extensive Damage Mitigation Guidelines, and FSG-00, Extended Loss of AC Power FLEX Strategy. These mitigative strategies were developed as a result of NRC Order on Mitigative Strategies (EA-02-026) and implement the requirements of License Condition 2.C.8, "Mitigation Strategy License Condition."

### 3.0 SITE DESCRIPTION

#### 3.1. Facility Description

OCNGS is operated by Exelon Generation. OCNGS ceased power operations in December 2019, and certified that fuel had been permanently removed from the reactor vessel. The 10 CFR Part 50 license for OCNGS will no longer authorize operation of the reactor, emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). OCNGS consists of a permanently shutdown boiling water reactor. An ISFSI is located on the facility site. The arrangement of the major OCNGS facilities is shown in Figure 3.1: OCNGS Site Arrangement.

The OCNGS site is 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. OCNGS is about two miles inland from the shore of Barnegat Bay and seven miles west northwest of Barnegat Light on the Atlantic shorefront. The site is approximately nine miles south of Toms River, New Jersey, about fifty miles east of Philadelphia, Pennsylvania, and sixty miles south of Newark, New Jersey.

The major transportation routes include the Garden State Parkway and U.S. Highway 9, running north and south; U.S. Highway 72, State Highways 37 and 70, New Jersey Routes 532, 530, 554 and Lacey Road running east and west, which serve primarily as feeder routes to the Garden State Parkway and U.S. Route 9. U.S. Highway 9 provides the eastern most site boundary. Exelon owns approximately 708 acres of property to the east of Route 9 extending to the Barnegat Bay. U.S. Highway 9 provides the only access routes to the site by land. Water access to the site is provided by the Intercostal Waterway, which runs through Barnegat Bay. A general area map showing the relative location of the OCNGS site is shown as Figure 3.2: OCNGS Site Relative Location.

#### 3.2. Area Characteristics and Land Use

##### Owner Controlled Area, Exclusion Area and Low Population Zone

The Owner Controlled Area (OCA) for the OCNGS includes all areas within the site perimeter security fence. At Oyster Creek, the minimum distance from the centerline of the OCNGS Reactor Building to the eastern OCA fence is approximately 800 feet.

The Exclusion Area for the OCNGS is a 1358 ft. radius as measured from the centerline of the Reactor Building. The licensee retains complete authority to determine and maintain sufficient control of all activities including the authority to exclude or remove personnel and property from land areas within the exclusion area.

##### Population and Population Distribution

The nearest population center is Toms River in Dover Township, 9.5 miles north of the site.

An appreciable variance in population density occurs during June, July and August due to seasonal transient vacationers. The Oyster Creek area, particularly the bay and seashores, is

a summer vacation area for the mid-Atlantic states. This seasonal population fluctuation occurs primarily in the eastern sectors.

#### Local Industry and Military Facilities

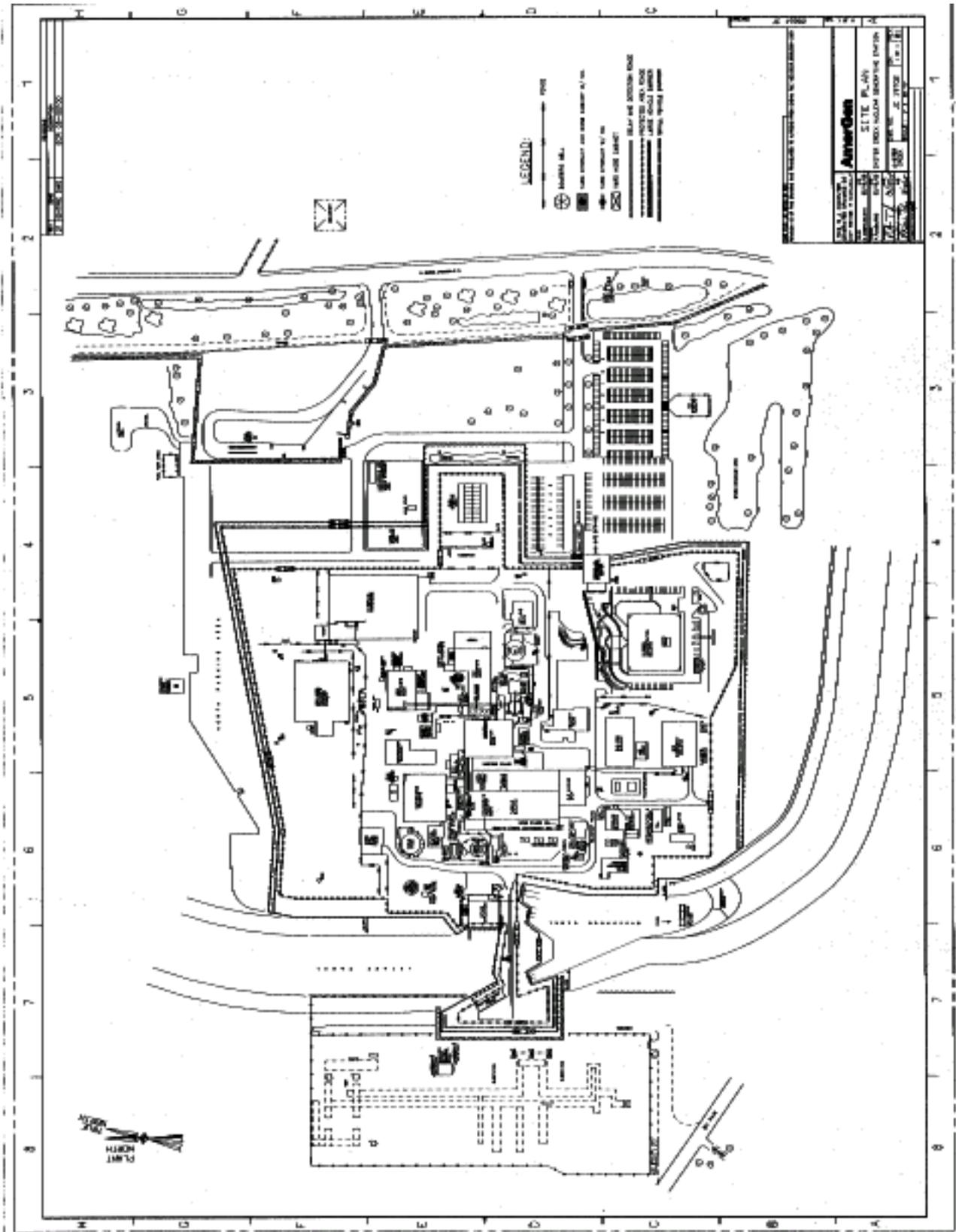
Typical industries within 10 miles of the OCNGS site are found in the Oyster Creek UFSAR.

The area within 40 miles of the site is comprised primarily of forest, vacant land, or farmland. Only about 25 percent of the land is developed. No major industry exists within a 10-mile radius of the site, although several small industrial concerns exist in the Toms River area.

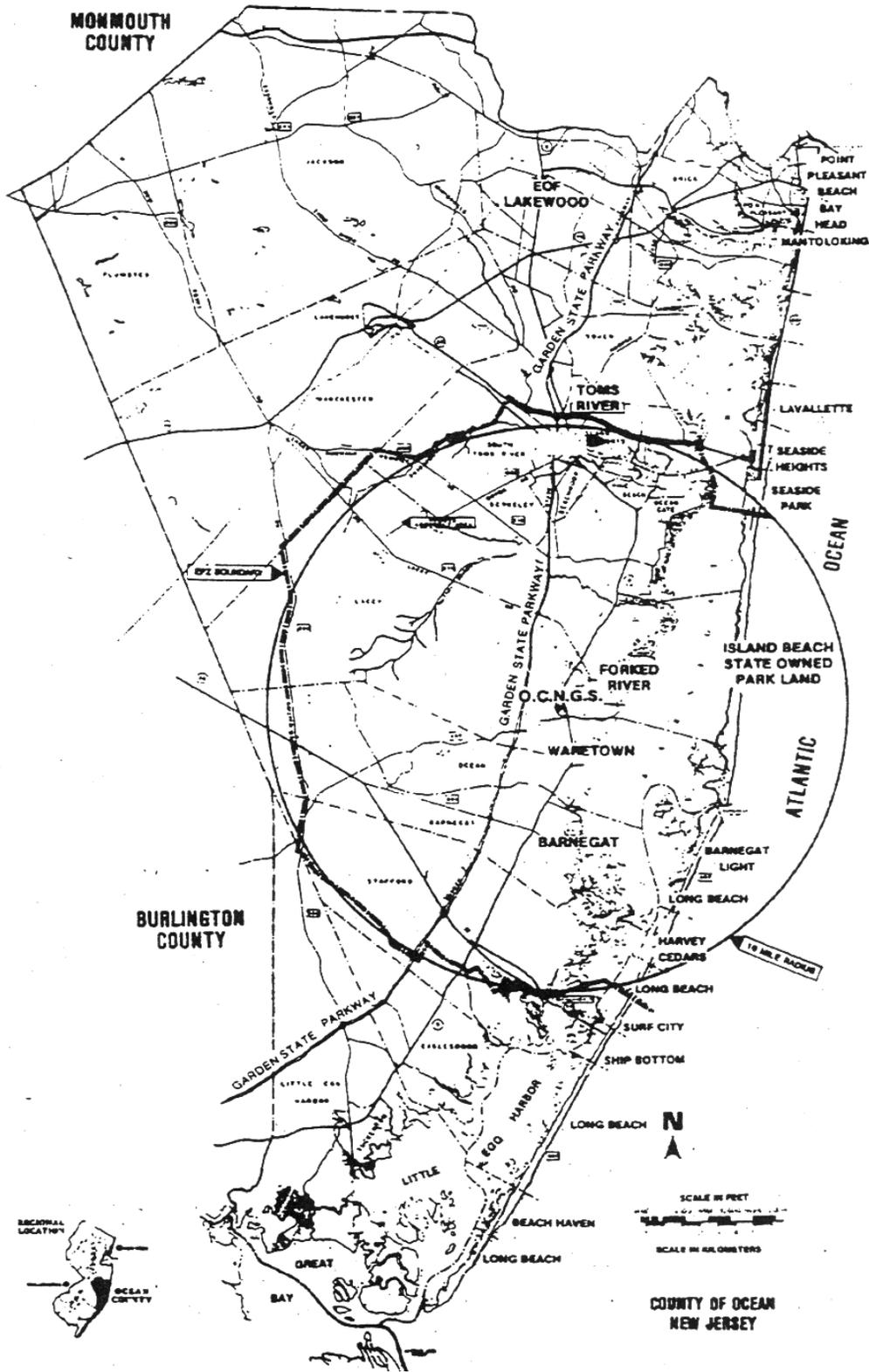
The nearest military installations are Fort Dix, New Jersey (approximately 35 miles northwest), McGuire Air Force Base (on the Fort Dix Military Reserve), and Lakehurst Naval Air Station (14 miles north). There is also a military reserve approximately 12 miles west along U.S. Route 72, utilized as a practice bombing range.

There is one general aviation airport, Robert J. Miller Airpark County Airport, approximately 9 miles northwest.

Figure 3.1: OCNCS Site Arrangement



**Figure 3.2: OCNGS Site Relative Location**



## 4.0 EMERGENCY CLASSIFICATION SYSTEM

The emergency classification system covers an entire spectrum of possible radiological and non-radiological emergencies at the OCNCS. The emergency classification system categorizes accidents and emergency situations, according to severity, into two emergency classification levels: Unusual Event and Alert.

The incidents leading to each of the emergency classifications are further identified by certain measurable and observable indicators of facility conditions or EALs. EALs addressed in Addendum 1 aid the operator in recognizing the potential of an incident immediately and assure that the first step in the emergency response is carried out. The classification of the event may change as the conditions change. OCNCS maintains the capability to assess, classify and declare an emergency condition in accordance with site procedures.

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 plant operators that an EAL threshold has been reached.

Incidents may be classified in a lower emergency classification level first, and then upgraded to the higher level if the situation deteriorates. An event will be terminated as described in Section 8.3, "Emergency Termination Criteria."

EALs and EAL bases were derived from NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors" Rev. 6, for classifying emergencies. Specifically, Appendix C of NEI 99-01, Rev. 6 contains a set of Initiating Conditions/ EALs for permanently defueled nuclear power plants that had previously operated under a 10 CFR Part 50 license and have permanently ceased operations. The classification system referenced in NEI 99-01, Rev. 6 has been endorsed by the NRC and provides a standard method for classifying emergencies.

### 4.1. Unusual Event

**EVENTS ARE IN PROGRESS OR HAVE OCCURRED WHICH INDICATE A POTENTIAL DEGRADATION OF THE LEVEL OF SAFETY OF THE FACILITY OR INDICATE A SECURITY THREAT TO FACILITY PROTECTION HAS BEEN INITIATED. NO RELEASES OF RADIOACTIVE MATERIAL REQUIRING OFFSITE RESPONSE OR MONITORING ARE EXPECTED UNLESS FURTHER DEGRADATION OF SAFETY SYSTEMS OCCURS.**

Unusual Event conditions do not cause serious damage to the facility. The purpose of the Unusual Event declaration is to:

- 1) provide for an increased awareness of abnormal conditions;
- 2) ensure that the first step in any response later found to be necessary has been carried out;
- 3) bring the ERO to a state of readiness;
- 4) provide for systematic handling of information and decision-making, and

- 5) augment on-shift personnel, if deemed necessary by the Emergency Director.

See Addendum 1 for a complete list of EALs corresponding to an Unusual Event.

#### 4.2. Alert

**EVENTS ARE IN PROGRESS OR HAVE OCCURRED WHICH INVOLVE AN ACTUAL OR POTENTIAL SUBSTANTIAL DEGRADATION OF THE LEVEL OF SAFETY OF THE FACILITY OR A SECURITY EVENT THAT INVOLVES PROBABLE LIFE THREATENING RISK TO SITE PERSONNEL OR DAMAGE TO SITE EQUIPMENT BECAUSE OF HOSTILE ACTION. ANY RELEASES ARE EXPECTED TO BE LIMITED TO SMALL FRACTIONS OF THE EPA PAG EXPOSURE LEVELS.**

The purpose of the Alert declaration is to:

- 1) activate the Emergency Response Organization to perform event mitigation and radiation monitoring, if required,
- 2) provide the State of New Jersey and the NRC with current information on facility status, and
- 3) ensure that all necessary resources are being applied to accident mitigation.

The Alert status shall be maintained until termination of the event occurs. Offsite authorities will be informed of the change in the emergency status and the necessary documentation shall be completed as specified in the EIPs.

Facility responses associated with this event classification assure that sufficient emergency response personnel are mobilized and respond to event conditions. Actual releases of radioactivity which exceed Technical Specification limits may be involved, thus radiation monitoring and dose projection may be required.

See Addendum 1 for a complete list of EALs corresponding to an Alert.

#### 4.3. Emergency Classification System Review by State Authorities

The emergency classification system specified above and the EALs presented in Addendum 1, are reviewed with the state authorities of New Jersey annually.

## 5.0 EMERGENCY RESPONSE FACILITIES AND EQUIPMENT

Following the declaration of an emergency, the activities of the emergency response organization are coordinated in the Control Room. Descriptions of OCNCS facilities and assessment capabilities are presented below.

### 5.1. Control Room

The Control Room is where facility systems and equipment parameters are monitored and is continuously occupied as per Technical Specifications. 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 the onsite center for emergency command and control.

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 emergency condition by the Shift Manager may result in activation of the ERO. 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 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 composition of the ERO is addressed in Section 7.2.

ERO activation may be modified or suspended if the safety of personnel may be jeopardized by a security event or other event hazardous to personnel.

The Control Room contains communications equipment, emergency radiation monitoring equipment, and emergency respiratory devices. Adjacent rooms store radiation protection clothing and other emergency supplies. The ERO has access to up-to-date technical documentation, including drawings, system information and procedures to enable mitigation planning and support of Control Room staff.

A general assembly area for emergency mitigation and radiation protection personnel is maintained.

### 5.2. Assessment Capability

The activation of the Emergency Plan and the continued assessment of accident conditions require monitoring and assessment capabilities. OCNCS maintains and operates on-site monitoring systems needed to provide data that is essential for initiating emergency measures and performing accident assessment, including dose assessment and assessing the magnitude of a release. This includes monitoring systems for plant processes, radiological conditions, meteorological conditions, and fire hazards. The essential monitoring systems needed are incorporated in the EALs specified in Addendum 1. This section briefly describes monitoring systems as well as other assessment capabilities.

### 5.2.1. Process Monitors

Annunciator and computer alarms are provided for a variety of parameters including the SFP cooling system to indicate SFP level, temperature, and pump status.

The manner in which process monitors are used for accident recognition and classification is given in the detailed EAL listings in Addendum 1.

### 5.2.2. Radiological Monitors

A number of radiation monitors and monitoring systems are provided on process and effluent liquid and gaseous lines that serve directly or indirectly as discharge route for radioactive materials. 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. The RMS alarms and initiates required emergency actions when radiation levels or radionuclide concentrations exceed predetermined levels. Area, liquid, and atmospheric monitoring subsystems are required to perform these functions.

Specific details on these monitoring systems such as location, type, etc., are contained in the DSAR.

The data from these subsystems are displayed by readout in the Control Room. Recorders and/or the facility process computer located in the Control Room.

#### 5.2.2.1. Area Radiation Monitors

Various reactor building areas are provided with area Geiger-Muller type radiation monitors. Each in-facility monitor has a remote indicator, an alarm and is recorded on one of two multi-channel recorders in the Control Room.

The monitors are provided with an upscale alarm that is set using past facility operating experience and warns of an abnormally high radiation level and each monitor is provided with a downscale alarm which warns of instrument channel failure.

#### 5.2.2.2. Process Liquid Monitoring Subsystem

The Process Liquid Monitoring Subsystem provides the continuous monitoring of two process liquid streams: the reactor building closed cooling water system and the reactor service water discharge. The reactor building closed cooling water probe is located at the discharge header of the cooling water pumps. The service water monitor is located in the service water discharge of the closed cooling water heat exchanger.

For liquid releases, the radionuclide concentration at any downstream location is determined by taking liquid effluent concentrations and applying the effluent flow rate and volumetric flow rate of the receiving water. Downstream users will be notified to curtail intake if the projected concentration is above the level specified in the procedures.

### 5.2.2.3. Atmospheric Radiation Monitoring

Atmospheric Radiation Monitoring is provided by Main Stack RAGEMS (Radioactive Gas Effluent Monitoring System) and Reactor Building Ventilation Monitoring.

RAGEMS has been installed to comply with NUREG-0737. This system will provide for a continuous monitoring of noble gas releases and continuous particulate samplers. The system is designed to detect noble gas. Particulate samples must be manually analyzed to provide isotopic concentrations of halogens and particulates. RAGEMS data is accessible from recorders in the control room and/or by accessing the RAGEMS system computers, or the facility computer system.

The Reactor Building Ventilation Monitoring Subsystem provides continuous monitoring of the gaseous discharges from the Reactor Building Ventilation systems through the use of two Geiger-Mueller detectors located upstream of the ventilation outlet isolation valves. The downscale alarm indicates instrument failure, while the upscale trip is set at an acceptable radiation concentration.

### 5.2.3. **Meteorological and Seismic**

The National Weather Service (NWS) Mt. Holly, NJ office provides meteorological information (e.g., wind speed, temperature, and wind direction) from several locations in the vicinity of OCNGS. This information is available by telephone or the internet.

Seismic information can be obtained from the U.S. Geological Surveys (USGS) National Earthquake Center by telephone or internet.

### 5.2.4. **Fire Detection and Suppression Equipment**

The fire protection system has been designed to detect and extinguish potential fires. The system is designed in accordance with the standards of the National Fire Protection Association (NFPA) and recommendations of the Nuclear Electric Insurance Limited (NEIL). Fire detectors are located throughout the facility with alarms and indicators in the Control Room. The fire protection system is described in the Oyster Creek Fire Protection Program.

### 5.2.5. **Assessment Facilities and Equipment**

Offsite fire departments of Forked River and Lanoka Harbor notify the facility of any fire which might have an impact on the facility. Local Law Enforcement Agencies notify Facility Security of any situation in the area which might have an impact on the facility.

OCNGS has access to outside analytical assistance and laboratory facilities from other non-affected Exelon nuclear sites, State and Federal agencies and other utilities. These laboratories can act as backup facilities in the event that the affected facility's radiochemistry counting room and laboratory become unusable or the offsite radiological monitoring and environmental sampling operation exceeds the capacity or capability of the facility laboratory during an emergency. It is estimated that these laboratories will be able to respond within several hours from initial notification.

The above facilities have the capability to perform laboratory analyses of various environmental samples (e.g., terrestrial, marine and air). It is also estimated that the analytical

assistance and laboratory support will be able to respond within four (4) to eight (8) hours from initial notification.

## 6.0 COMMUNICATIONS

Various modes of communication are available to facility staff to transmit information within OCNGS and to various locations offsite during normal and emergency conditions.

This section describes the provisions utilized for prompt communications among principal emergency response organizations, communications with the ERO and communications with the general public. Figure 6-1 depicts the notification paths and the organizational titles from the Exelon Nuclear Emergency Response Facility (ERF) to federal, state and local emergency response organizations, and industry support agencies.

Exelon Nuclear has extensive and reliable communication systems installed at OCNGS. 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. This network provides:

1) Local Commercial Telephone System:

The commercial telephone system (see Section 2.6) is the primary emergency notification system between OCNGS, State, and county agencies and is used to provide initial and follow-up notifications and for general information flow between these agencies.

In addition, facility communication links exist to ensure appropriate information transfer capabilities during an emergency. The facility may also utilize its Public Address System, facility radios and notification devices to augment its emergency communications.

2) ERO Notification:

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.

3) NRC Communications (ENS)

Communications with the NRC Operations Center will be performed via the NRC ENS circuit or commercial telephone line. Information is normally communicated from an approved NRC Event Notification Worksheet prior to establishing an open ENS line. Installation and use of these NRC telephones is under the direction of the NRC.

Emergency Notification System (ENS):

Dedicated telephone equipment is in place between the Control Room and the NRC. This line is used for NRC event notifications and status updates.

4) Radio Communications

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.

OCNGS, base stations are located in the Control Room. The Control Room has the capability of transmitting and receiving on the State Emergency Radio (EMRAD) Network that provides a communication path with the State of New Jersey and Ocean County Emergency Management Centers.

5) Facility Warning System

In addition, facility communication links exist to ensure appropriate information transfer capabilities during an emergency. The facility may also utilize its Facility Warning System, facility radios and pagers to augment its emergency communications. The Facility Warning System consists of the following:

1) Alarms: Audible alarms are a quick and effective means of communicating emergency warnings on the site. Alarms currently installed at Oyster Creek include:

- Facility Emergency Alarm
- Fire Alarm
- Reactor Building Evacuation Alarm

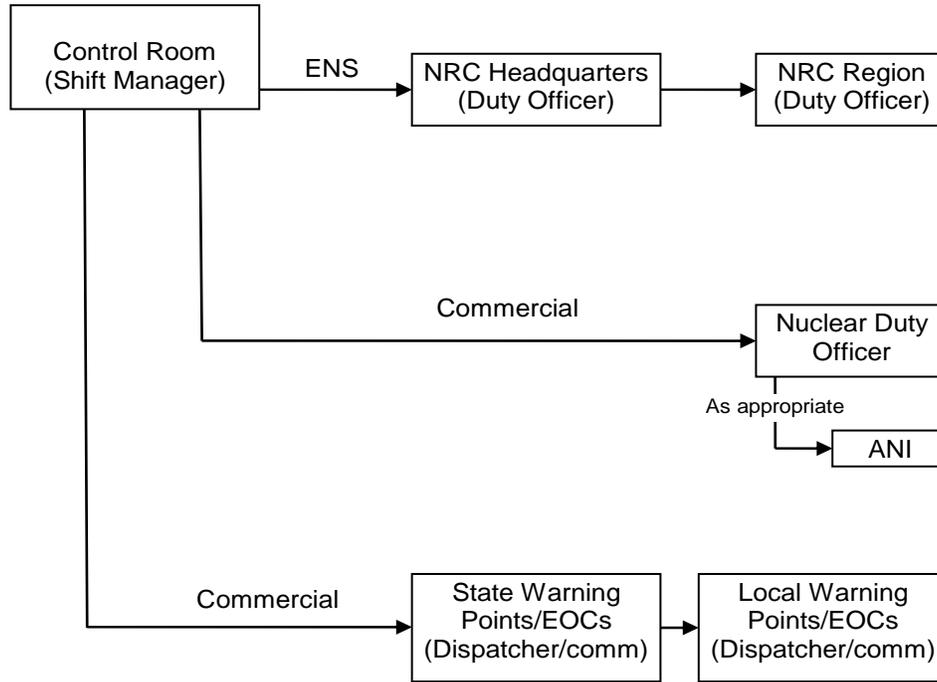
Each alarm provides a distinctive sound that all site personnel and contractors are trained to recognize and respond to. The Facility Emergency Alarm will be followed by an announcement that provides emergency information such as class of emergency declared, accountability directions, radiological precautions, etc. The reactor building evacuation alarm is supplemented with flashing lights at specific locations in the reactor building to provide both audible and visual warnings.

The Control Room alarm systems consist of overhead annunciators, panel annunciators and computer alarms. The overhead and panel annunciators consist of flashing translucent tiles and audible indicators (i.e., buzzer or horn). The computer alarms use annunciators and also provide specific data using the alarm printer.

2) Facility Paging System: 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.

**Figure 6.1: Exelon Notification Scheme**



## 7.0 ORGANIZATION

This section describes how the normal facility and support organizations transform into an emergency response organization to effectively deal with any incident at OCNGS.

### 7.1. Normal Facility Organization

The personnel and resources of OCNGS's normal facility and management organization consist of the onsite facility organization supported by the engineering and management organizations located offsite. The relationship and content of these onsite and offsite organizations are specified in the facility Technical Specifications, and the OCNGS Defueled Quality Assurance Manual.

The minimum staff required to conduct routine and immediate emergency mitigation is maintained at the facility. During normal conditions, the minimum staff on duty at the facility during all shifts consists of one (1) Shift Manager, one (1) Non-Certified Operator, one (1) Radiation Protection Technician and security personnel as indicated in Figure 7.1 and Table 7.1. Security and Fire Brigade personnel are staffed in accordance with the Site Security Plan and Fire Protection Plan. The responsibility for monitoring the status of the facility and approving all onsite activities is assigned to the Shift Manager. When an emergency situation becomes apparent, the Shift Manager shall assume the position of Emergency Director once the emergency classification has been made. Additional personnel are available on an on-call basis to respond to facility emergencies.

#### 7.1.1. Shift Manager/Emergency Director

The Shift Manager position is staffed at the facility 24 hours a day and is the senior management position at the facility during off-hours. This position is responsible for monitoring facility conditions and approving onsite activities. The position has the authority, management ability, and technical knowledge to classify and declare a facility emergency and assume the Emergency Director role.

The Emergency Director shall assume command and control upon declaration of an event. The Emergency Director is responsible for the direction of the total emergency response and has the company authority to accomplish the following responsibilities, which cannot be delegated:

1. Classification of event
2. Approval of emergency notification (Task of making notifications may be delegated)
3. Authorization of emergency exposure controls in excess of 5 Rem TEDE and the issuance of potassium iodide (KI), for Exelon Nuclear emergency workers per EPA-400 (radiation exposures in excess of 10 CFR Part 20 limits).

Other responsibilities assumed by the Emergency Director include:

1. Notification of the emergency classification to the NRC and State of New Jersey
2. Management of available facility resources
3. Initiation of mitigating actions
4. Initiation of corrective actions
5. Initiation of onsite protective actions
6. Decision to call for offsite assistance (police, fire or ambulance)
7. Augment the ERO staff as deemed necessary
8. Coordinate Security activities
9. Terminate the emergency condition when appropriate
10. Performance of initial Dose Assessment
11. Maintain a record of event activities

#### **7.1.2. Non-Certified Operator**

The Non-Certified Operator, on-shift 24 hours a day, performs system and component manipulations. The organizational relationship to the Shift Manager/Emergency Director is the same during normal and abnormal situations.

#### **7.1.3. Radiation Protection Technician**

The Radiation Protection Technician, on-shift 24 hours a day, is available to monitor personnel exposure, determine if radiological conditions preclude access to areas necessary to maintain SFP cooling, and to provide timely field survey results, if necessary.

#### **7.1.4. Security**

Security staffing is maintained in accordance with the Security Plan. The Security Force will report to the Emergency Director when implementing the PDEP.

## 7.2. Emergency Response Organization

The OCNCS ERO is activated at an Alert classification. However, it can be activated in part or in whole at the discretion of the Emergency Director for an Unusual Event.

Plans and procedures are in place to ensure the timely activation of the ERO. The goal of the ERO is to augment the on-shift staff within 2 hours of an Alert classification. The designated on-shift and augmented OCNCS ERO staff are capable of continuous (24-hour) operations for a protracted period.

The minimum augmented staff consists of a Technical Coordinator and a Radiation Protection Coordinator. Augmented staff provides the technical expertise required to assist the Emergency Director. The on-shift staff is augmented by additional personnel that report as directed after receiving notification of an emergency requiring augmented staff.

Designated members of the on-shift staff fulfill roles within the ERO appropriate with their training and experience. For example, Radiation Protection personnel would be expected to undertake radiation protection activities, Security personnel would undertake security activities, engineering personnel would focus on facility assessment, provide technical support, and assist in recovery operations as designated by the Technical Coordinator, Operations personnel would focus on facility operations.

The OCNCS ERO is illustrated in Figure 7.1. Table 7.1 provides a representation of the functional responsibilities of the on-shift and ERO positions that fulfill the emergency staffing requirements.

### 7.2.1. Technical Coordinator

The Technical Coordinator reports to the Emergency Director. During an emergency, the responsibilities of the Technical Coordinator include:

1. Evaluate technical data pertinent to facility conditions
2. Augment the emergency staff as deemed necessary
3. Designate engineering support, as necessary, to evaluate facility conditions and provide technical support,
4. Recommend mitigating and corrective actions
5. Direct search and rescue operations
6. Coordinate maintenance and equipment restoration
7. Establish and maintain communications as desired by the Emergency Director
8. Maintain a record of event activities

### 7.2.2. Radiation Protection Coordinator

The Radiation Protection Coordinator reports to the Emergency Director. During an emergency, the responsibilities of the Radiation Protection Coordinator include:

1. Monitor personnel accumulated dose

2. Advise the Emergency Director concerning Radiological EALs
3. Augment the emergency staff as deemed necessary
4. Direct radiological monitoring and analysis
5. Perform Dose Assessment
6. Coordinate decontamination activities
7. Establish and maintain communications as desired by the Emergency Director
8. Maintain a record of event activities

### **7.2.3. Extensions of the Oyster Creek Emergency Response Organization**

#### **7.2.3.1. Local Services**

Arrangements have been made for the extension of the ERO's capability to address emergencies. The following 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 the facility:

1. Transportation of injured personnel using an ambulance service;
2. Treatment of radioactively contaminated and injured personnel at a local support hospital (Community Medical Center and Southern Ocean Medical Center, NJ) as specified in the local support hospital plans; and
3. Fire support services by the Lanoka Harbor Fire Department, Forked River Volunteer Fire Company, and Bayville Fire Department.
4. Law enforcement support services provided by local (Lacey Township Police Department), state (New Jersey State Police), and federal law enforcement authorities as appropriate and response capabilities are documented in the letters of agreement maintained by Security.

Evidence of agreements with participating local services is listed in Appendix 4.

#### **7.2.3.2. Federal Government Support**

Resources of federal agencies appropriate to an emergency condition are made available in accordance with the National Response Framework. This plan and the resources behind it are activated through the facility notification of the NRC.

#### **7.2.3.3. Additional Support**

Dependent upon the emergency condition and response needs, the OCNCS ERO can be augmented by personnel and equipment support from the remainder of the Exelon Nuclear organization. This support capability is outlined in the Emergency Plan Implementing Procedures referenced in Appendix 2.

### **7.2.4. Recovery Organization**

The emergency measures presented in this plan are actions designated to mitigate the consequences of the accident in a manner that affords the maximum protection to facility

personnel. Planning for recovery involves the development of general principles and an organizational capability that can be adapted to any emergency situation. Upon termination of an emergency, the Emergency Director assembles the recovery organization, as necessary, 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 during the initial recovery phase; and
- Keeping corporate support apprised of recovery activities and requirements.

The remainder of the recovery organization consists of the normal plant and emergency organizations described in Section 7.1 and 7.2, as necessary, to provide the radiological and technical expertise required to assist the Emergency Director restore the plant to normal conditions.

The following is a brief summary of the recovery organization's responsibilities:

1. Maintain comprehensive radiological surveillance of the facility to assure continuous control and recognition of problems;
2. Control access to the area and exposure to workers;
3. Decontaminate affected areas and/or equipment;
4. Conduct clean-up and restoration activities;
5. Isolate and repair damaged systems;
6. Document all proceedings of the accident and review the effectiveness of the emergency organization in reducing public hazard and/or facility damage.

The organization relies on facility staff and/or resources to restore the facility to normal conditions. The expertise provided through the support plans is available to aid with the necessary corrective actions required to control and/or restore normal facility status.

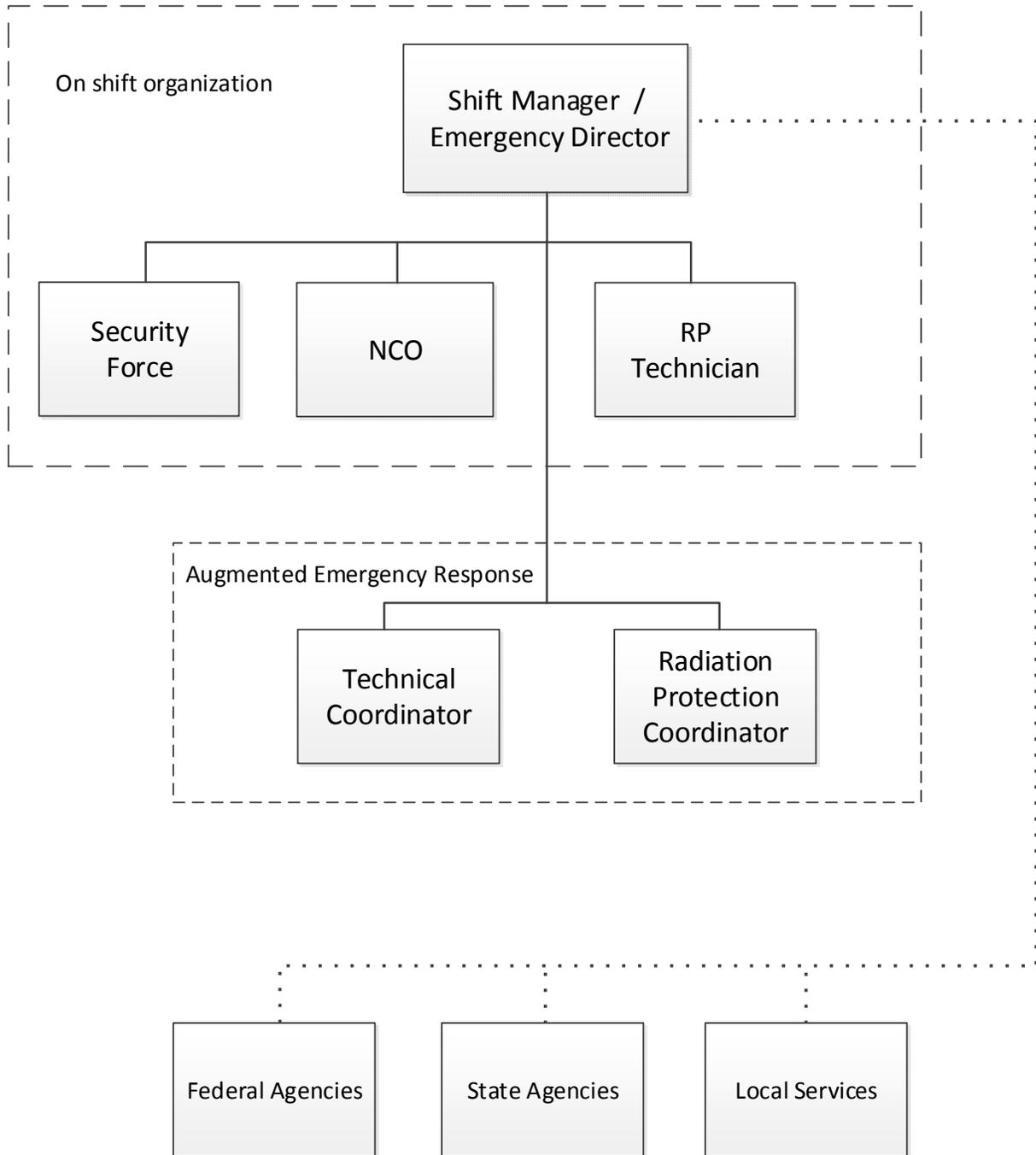
When facility conditions allow a transition from the emergency phase to the recovery phase, the Emergency Director conducts a facility emergency management meeting to discuss the recovery organization. The actions taken by this organization concerning termination of the emergency proceeds in accordance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

### **7.3. Coordination with State Government Authorities**

Section 6.0 describes the communications network between OCNGS and the State of New Jersey as a means of promptly notifying appropriate authorities under accident conditions.

The Shift Manager initiates notification of New Jersey authorities, providing them with applicable information utilizing an established message format that describes the accident status. The Emergency Director, or designee, issues periodic reports to State of New Jersey authorities.

**Figure 7.1: Normal On-Shift and Emergency Response Organization**



**Note:** Fire Brigade is staffed in accordance with the Fire Protection Program.

**Table 7.1: Minimum On-Shift and ERO Staffing Requirements**

MAJOR FUNCTIONAL AREA	MAJOR TASKS	LOCATION	OCNGS EMERGENCY POSITION, TITLE, OR EXPERTISE	# ON-SHIFT	OCNGS AUGMENTED STAFF CAPABILITY FOR RESPONSE IN 2 HOURS
Facility Operations and assessment of Operational Aspects / Fire Brigade	Facility Equipment	Control Room	Non-Certified Operator	1	–
Emergency Direction and Control	Emergency Director	Control Room	Shift Manager	1	–
Notification/Communication	Notify Licensee, State local and Federal personnel and maintain communications	Control Room			–
Radiological Accident Assessment and Support of Operational Accident Assessment	Onsite Dose Assessment and Monitoring	As Directed by the Emergency Director	Radiation Protection Coordinator	–	1 (may augment the ERO with Radiation Monitoring Personnel as deemed necessary)
Protective Actions (In-Facility)	In-Facility Surveys Radiation Protection a. Access Control b. HP Coverage for Repair, Corrective Actions, Search and Rescue, First Aid, and Firefighting c. Personnel Monitoring d. Dosimetry	On-Scene	Radiation Protection Technician	1	–
Facility Condition Evaluation, Repair, and Corrective Action	Technical Support Repair, Mitigation, and Corrective Action	As Directed by the Emergency Director	Technical Coordinator	–	1 (may augment the ERO with technical support and emergency repair personnel as deemed necessary)
	Develop strategies for search and rescue and fire fighting				
Firefighting	Firefighting	On-Scene	Fire Brigade	Per the Fire Protection Plan	–
Fire Team Leader Rescue Operations/ First Aid	Fire Fighting Rescue and First Aid	On- Scene	Fire Brigade	Per the Fire Protection Plan	–
Site Access Control and Accountability	Security, Firefighting, Communications, and Personnel Accountability	Per the Physical Security Plan	Security Personnel	Per the Physical Security Plan	–

## **8.0 EMERGENCY RESPONSE**

### **8.1. Emergency Condition Recognition and Classification**

OCNGS maintains the capability to assess, classify, and declare an emergency condition in accordance with facility procedures. The expectation is that 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.

Section 4.0 presents the emergency classification system used for categorizing the spectrum of possible emergency conditions into one of two emergency classes. The process of condition recognition, immediate response to correct the condition, event classification, and initiation of the appropriate emergency implementing procedures are critical responsibilities of the Shift Manager and the on-shift crew.

Site procedures contain the listing of conditions that represents each of the two emergency categories and the detailed EALs that allow the Shift Manager to determine the emergency classification. Once the emergency is classified, the applicable emergency implementing procedure is initiated, the ERO is activated and the notification of offsite authorities is initiated. The activation of the ERO brings to the assistance of the on-shift personnel the various support elements described in this plan. Specific support elements are implemented as detailed in the emergency implementing procedures. See Appendix 2 for a listing of these procedures.

### **8.2. Activation of the Emergency Response Organization**

Classification of an accident condition requires that the facility staff recognize that pre-established EALs associated with an emergency condition, as defined in Addendum 1, have been reached or exceeded. Depending upon the specific action levels attained, the Shift Manager declares one of the following: Unusual Event or Alert. The Shift Manager activates the ERO if facility conditions reach predetermined EALs. The ERO shall be activated at the Alert classification.

#### **8.2.1. Unusual Event Response**

Addendum 1 defines the conditions that require the declaration of an Unusual Event. An Unusual Event does not activate the ERO, but may require augmentation of on-shift resources to address the event. However, the ERO may be activated, in part or in whole, at any time at the discretion of the Shift Manager/Emergency Director. Offsite emergency organizations are notified for informational purposes, and aid from offsite fire, medical, and security organizations may be required depending on the nature of the event.

The response required as a result of this declaration of a Unusual Event varies according to the specified event, but a general summary of actions taken is described below:

1. The emergency condition is recognized and classified by the Shift Manager who instructs Control Room personnel to announce the emergency classification over the facility page system;
2. The on-duty and selected facility personnel respond as directed by the Shift Manager and assume assigned functions;
3. Control Room personnel notify the New Jersey State authorities;
4. The NRC is notified via ENS;
5. Other support is requested as necessary;
6. The Emergency Call-in Method is implemented as shown in the notification plan (Figure 8.1);
7. Additional personnel report to the facility as requested by the Shift Manager;
8. The Shift Manager/Emergency Director directs the activities of emergency response personnel;
9. If necessary, appropriate emergency medical, fire department, or law enforcement agencies are notified and requested to respond;
10. The public information representative is notified and handles public information associated with the event; and
11. The Shift Manager/Emergency Director terminates the Unusual Event status and closes out the event with a verbal summary to offsite authorities or escalates to higher level emergency classification.

The Unusual Event status will be maintained until an escalation in emergency class occurs or the event is terminated. Offsite authorities will be informed of the change in the emergency status and the necessary documentation will be completed as specified in site procedures.

### **8.2.2. Alert Response**

An Alert requires actions to assure that sufficient emergency response personnel are mobilized to respond to the accident conditions at the site. Notification is made to State officials and follow-up information is provided as needed to offsite emergency organizations. In an Alert, the steps listed in the Unusual Event Response section and the following are performed:

1. ERO report to the Emergency Director;
2. The Shift Manager/ Emergency Director directs the evacuation of all visitors and unnecessary contractors from the facility;
3. If sufficient personnel are not available onsite, off-duty personnel are called in as specified in the emergency implementing procedures;
4. The Emergency Director assumes total responsibility for overall emergency response actions and recovery;
5. The Emergency Director reaches agreement with offsite authorities concerning

termination of the event, and closes out the event by verbal summary to offsite authorities. If an event is a reportable occurrence, a written summary is issued to these authorities in an appropriate time frame through distribution by the Emergency Director.

The Alert status shall be maintained until termination of the event occurs. Off-site authorities will be informed of the change in the emergency status and the necessary documentation shall be completed as specified in site procedures.

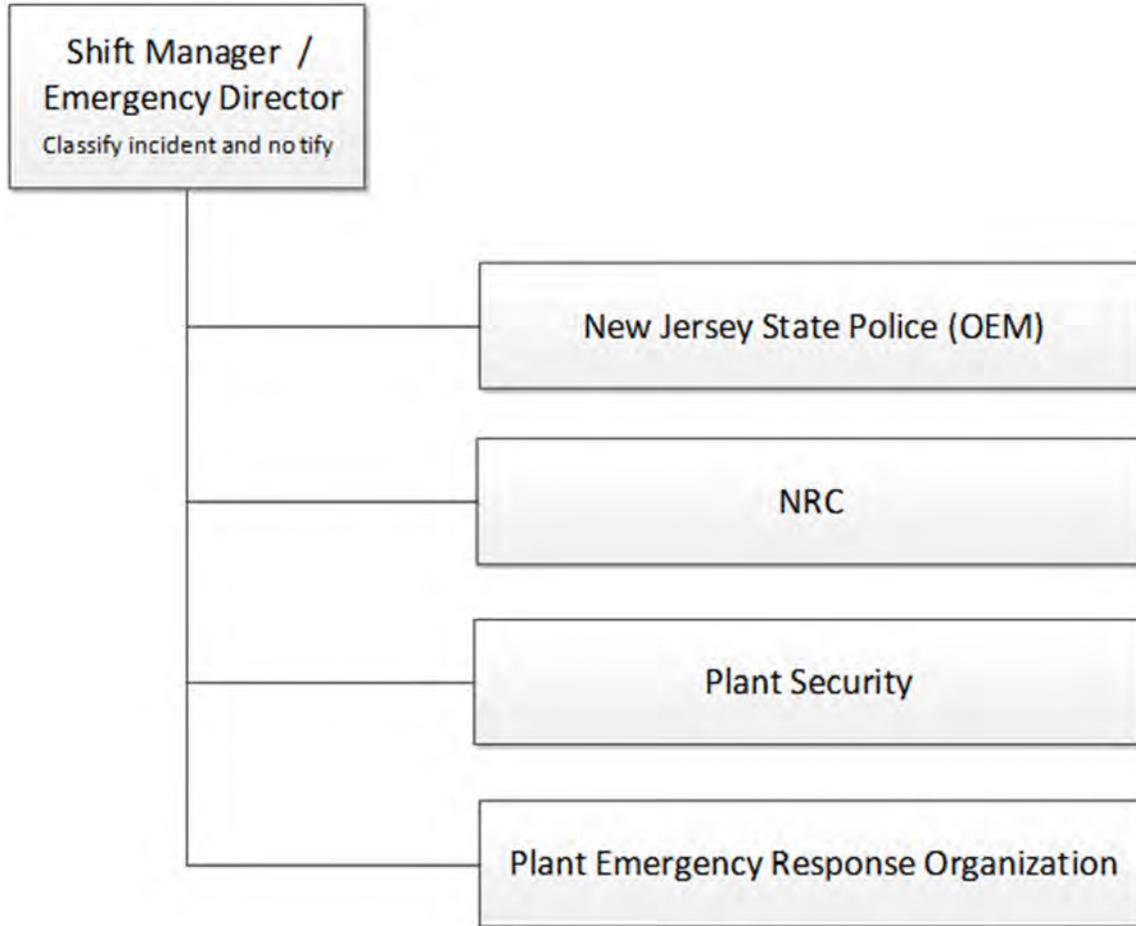
### **8.3. Emergency Termination Criteria**

An extensive review of facility parameters including SFP parameters and process and radiation monitoring systems, in conjunction with the pre-established EALs is required to terminate an emergency.

Termination of an emergency status is the responsibility of the Emergency Director. The decision will be based on the following considerations:

1. Conditions no longer meet an EAL and it appears unlikely that conditions will deteriorate;
2. Facility releases of radioactive materials to the environment are under control (within Technical Specifications);
3. In-Facility radiation levels are stable or decreasing, and are acceptable given facility conditions;
4. Operability and integrity of power supplies, electrical equipment and facility instrumentation including radiation monitoring equipment is acceptable;
5. All required notifications have been made;
6. Radiological and facility conditions permit resumption of normal occupational exposure limits to continue mitigation/repair activities.

**Figure 8.1: Notification Plan**



## **9.0 RADIOLOGICAL ASSESSMENT AND PROTECTIVE MEASURES**

### **9.1. Radiological Assessment**

#### **9.1.1. Initial Radiological Dose Projection**

OCNGS has developed a method to quickly determine the projected radiological conditions at the Site boundary. During the initial stages of an emergency, the Shift Manager or designated individual is responsible to perform the initial evaluation of radiological conditions. The initial evaluation is accomplished in accordance with site procedures.

### **9.2. Radiological Exposure Control**

During a facility emergency, abnormally high levels of radiation and/or radioactivity may be encountered by facility personnel. All reasonable measures shall be 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.

Table 9.1 specifies the guidelines on emergency dose limits for personnel providing emergency response duties consistent with Table 2-2, "Guidance on Dose Limits for Workers Performing Emergency Services," provided in the EPA PAG Manual (Reference 12). 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 Radiation Protection Coordinator. Exposure to individuals providing emergency functions will be consistent with the limits specified in Table 9.1 with every attempt made to keep exposures As Low As Reasonably Achievable (ALARA).

The Radiation Protection 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). Dose records will be maintained based upon the results of the self-reading dosimeters. This information is cross-referenced with the DLR data. The capability exists for the emergency processing of DLRs on a 24-hour per day basis. Emergency workers are instructed to read self-reading dosimeters frequently, and DLRs may be processed with increased periodicity.

### **9.3. Protective Measures**

#### **9.3.1. Site Personnel Accountability**

Accountability should be 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.

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.

### **9.3.2. Site Egress Control Methods**

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.

### **9.3.3. Contamination Control and Decontamination Capability**

During emergency conditions, OCNGS maintains normal plant decontamination and contamination control measures as closely as possible. However, these measures may be modified by the Emergency Director should conditions warrant.

OCNGS maintains contamination control measures to address area access control, drinking water and food supplies, and the return of areas and items to normal use.

- a. Contaminated areas are isolated as restricted areas with appropriate radiological protection and access control. Personnel leaving contaminated areas are monitored to ensure both themselves and their clothing are not contaminated. Supplies, instruments, and equipment that are in contaminated areas or have been brought into contaminated areas will be monitored prior to removal. Items found to be contaminated, will be decontaminated using normal plant decontamination techniques and facilities or may be disposed of as radioactive waste.
- b. Should the potential exist for contamination of on-site food or drinking water supplies that renders these supplies non-consumable, OCNGS will make arrangements for transport of non-contaminated off-site supplies.
- c. OCNGS permits areas and items to be returned to normal use following conduct of appropriate surveys and verification that contamination levels have returned to acceptable levels.

OCNGS maintains an in-plant decontamination facility. Waste generated through the use of this system is collected and processed by the plant liquid radwaste system. Survey instrumentation for personnel "frisking" and sensitive body burden monitoring equipment are available. Decontamination is performed under the direction of the Radiation Protection Coordinator.

### **9.3.4. Use of Onsite Protective Equipment and Supplies**

The facility supplies of personnel radiation protection equipment and gear 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.

### **9.3.5. Fire Fighting**

Strategies have been developed for firefighting and fire protection in specific critical areas of the facility. The Fire Protection Program describes the fire protection organization and individual responsibilities.

## **9.4. Aid to Affected Personnel**

This section describes the arrangements for medical services for contaminated injured individuals sent from the facility.

### **9.4.1. Offsite Hospital and Medical Services**

Hospital personnel have been trained and hospitals are equipped to handle contaminated or radiation injured individuals. Specifically, training of medical support personnel at the agreement hospitals will include basic training on the nature of radiological emergencies, diagnosis and treatment, and follow-up medical care. Facility personnel are available to assist medical personnel with decontamination radiation exposure and contamination control. Arrangements, by letter of agreement or contract, are maintained by the facility with a qualified hospital located in the vicinity of each nuclear generating station for receiving and treating contaminated or exposed persons with injuries requiring immediate hospital care. Exelon Nuclear shall provide medical consultants to aid in any special care necessary at these facilities.

Arrangements are also maintained with a qualified medical facility well equipped and staffed for dealing with persons having radiation injuries and whenever necessary, such persons will be transferred to this hospital facility for extended specialized treatment. Exelon Nuclear will have available to the staff of this hospital, medical consultants who will provide the direction of the special care necessary for the treatment of persons having radiation injuries.

These agreements are verified annually. Refer to Appendix 4 for details.

### **9.4.2. Onsite First Aid Capability**

Oyster Creek maintains onsite first aid supplies and equipment necessary for the treatment of contaminated or injured persons. In general, physicians or nurses are not staffed at Oyster Creek, and as such, medical treatment given to injured persons is of a "first aid" nature. Additionally, the Radiation Protection Technicians at Oyster Creek are experienced in control of radioactive contamination and decontamination work. Facility personnel are also trained and qualified to administer first aid. At least two of these individuals are available on shift at all times. The functions of facility personnel in handling onsite injured people are:

1. Afford rescue;
2. Administer first aid including such resuscitative measures as are deemed necessary;
3. Begin decontamination procedures; and
4. Arrange for suitable transportation to a hospital when required.

Primary attention shall be directed to the actual factors involved in the treatment of casualties, such as: control of bleeding, resuscitation including heart and lung, control of bleeding after resuscitation, protection of wounds from bacterial or radioactive contamination and the immobilization of fractures.

Facility personnel provide an initial estimate of the magnitude of surface contamination of the injured and preliminary estimates of total body dose to the injured. Primary rapid and simple decontamination of the surface of the body (when possible and advisable) before transportation to a designated hospital may be carry out as directed or performed by Radiation Protection personnel. When more professional care is needed, injured persons are transported to a local clinic or hospital. Contaminated and injured persons are transported to a dedicated specified facility.

#### **9.4.3. Medical Service Facilities**

Because of the specialized nature of the diagnosis and treatment of radiation injuries, Corporate Emergency Preparedness maintains an agreement with Radiation Emergency Assistance Center/Training Site (REAC/TS). REAC/TS is a radiological emergency response team of physicians, nurses, health physicists and necessary support personnel on 24-hour call to provide consultative or direct medical or radiological assistance at the REAC/TS facility or at the accident site. Specifically, the team has expertise in and is equipped to conduct: medical and radiological triage; decontamination procedures and therapies for external contamination and internally deposited radionuclides, including chelation therapy; diagnostic and prognostic assessments or radiation-induced injuries; and radiation dose estimates by methods that include cytogenetic analysis, bioassay, and in vivo counting.

In addition to REAC/TS, the Facility Annex may identify additional medical consultants, based on agreements with local hospitals, to support personnel training and medical response.

#### **9.4.4. Medical Transportation**

Arrangements are made for prompt ambulance transport of persons with injuries involving radioactivity to designated hospitals. Such service is available on a 24-hour per day basis and is confirmed by letter of agreement. Radiation monitoring services shall be provided by Oyster Creek whenever it becomes necessary to use the ambulance service for the transportation of contaminated persons.

A qualified Radiation Protection person shall accompany the ambulance to the hospital. Additional Radiation Protection personnel may be contacted and dispatched to local hospitals to assist in the monitoring and decontamination of the injured victim and hospital and ambulance facilities and personnel.

### **9.5. Protective Actions for Onsite Personnel**

This section of the plan describes the means for controlling emergency worker radiological exposures during an emergency, as well as the measures that are used by Exelon to provide necessary assistance to persons injured or exposed to radiation and/or radioactive materials.

Exposure guidelines in this section are consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides described in EPA 400-R-92-001 (EPA-400) (Reference 12).

### 9.5.1. Emergency Exposure Guidelines

Being licensed by the NRC, all Exelon Nuclear generating stations maintain personnel exposure control programs in accordance with 10 CFR 20 under normal operating conditions. The Facility Emergency Director is assigned the non-delegable responsibility for authorizing personnel exposure levels under emergency conditions per EPA-400. In emergency situations, workers may receive exposure under a variety of circumstances in order to assure safety and protection of others and of valuable property. These exposures will be justified if the maximum risks or costs to others that are avoided by their actions outweigh the risks to which the workers are subjected. The Emergency Worker Dose Limits are as follows:

**Table 9.1: Emergency Dose Limits**

Dose Limit (Rem TEDE)	Activity	Condition
0-5 Rem	All	Personnel should be kept within normal 10 CFR 20 limits during bona fide emergencies, except as authorized for activities as indicated below.
5-10 Rem	Protecting valuable property	Lower dose not practicable.
10-25 Rem	Lifesaving or protection of large populations	Lower dose not practicable.
>25 Rem	Lifesaving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved.

Limit dose to the lens of the eye to 3 times the above values and doses to any other organ (including skin and body extremities) to 10 times the above values.

Whenever possible, the concurrence of the facility's Radiation Protection (Department) Manager should be secured before exposing individuals to dose equivalents beyond the EPA-PAG Manual lower limit.

### 9.5.2. Emergency Radiation Protection Program

The Radiation Protection Manager is the individual responsible for the implementation of the radiation protection actions during an emergency. Radiation protection guidelines include the following:

- Volunteers over forty-five years of age are considered first for any emergency

response action requiring exposure greater than normal limits. Routine dose limits shall not be extended to emergency dose limits for declared pregnant individuals. As in the case of normal occupational exposure, doses received under emergency conditions should be maintained as low as reasonably achievable.

- Persons undertaking any emergency operation in which the dose will exceed 25 Rem TEDE should do so only on a voluntary basis and with full awareness of the risks involved including the numerical levels of dose at which acute effects of radiation will be incurred and numerical estimates of the risk of delayed effects.
- In the context of the emergency limits, exposure of workers that is incurred for the protection of large populations may be considered justified for situations in which the collective dose avoided by the emergency operation is significantly larger than that incurred by the workers involved.
- Exposure accountability is maintained and proper personnel radiological monitoring equipment is provided for all personnel during emergency conditions.
- Access to high radiation areas is only permitted with prior approval of the applicable Radiation Protection Manager. Personnel are not allowed to enter known or potential high radiation areas unless their exposure has been properly evaluated.
- Periodic habitability surveys of emergency facilities are performed during an emergency. If the facility is determined to be uninhabitable, the facility is evacuated in order to prevent or minimize exposure to radiation and radioactive materials. Alternate assembly areas are established, as necessary, to relocate and monitor evacuated personnel.

#### **9.5.3. Personnel Monitoring**

- a. Emergency workers will receive DLR badges and personal self-reading dosimeters capable of measuring expected exposures on a real time basis. The capability exists for the emergency processing of DLRs on a 24-hour per day basis, if necessary.
- b. Emergency worker dose records are maintained by the Radiation Protection Managers (as appropriate) in accordance with the emergency and radiological protection procedures. Emergency workers are instructed to read their dosimeters frequently. DLRs may be processed with increased periodicity.

#### **9.5.4. Non-Exelon Personnel Exposure Authorization**

The responsibility for authorizing non-Exelon emergency workers (i.e. state and local agency emergency workers) to receive exposures in excess of the EPA General Public Protective Action Guides rests with the state and county organizations, except when such emergency workers are onsite. Authorization of exposures in excess of EPA General Public Protective Action Guides, in this latter instance, rests with the Facility Emergency Director.

### 9.5.5. Contamination and Decontamination

During an emergency, the Facility Emergency Director is responsible for preventing or minimizing personnel exposure to radioactive materials deposited on the ground or other surfaces.

- a. During emergency conditions, normal facility contamination control criteria will be adhered to as much as possible. However, these limits may be modified by the Emergency Director per existing Radiation Protection procedures, should conditions warrant.
- b. Personnel found to be contaminated will normally be attended to at decontamination areas located onsite. Temporary decontamination areas can also be set up inside at various locations. Decontamination showers and supplies are provided onsite with additional personnel decontamination equipment and capabilities. Shower and sink drains in the controlled area is processed and monitored prior to discharge. Potentially contaminated emergency vehicles will be surveyed before they are allowed to leave the facility or offsite assembly area. If the survey area is not suitable for monitoring and decontamination due to radiological or other concerns, vehicles will be surveyed at an alternate location.

### 9.5.6. Contamination Control Measures

Controls are established 24 hours per day to contain the spread of loose surface radioactive contamination.

- a. Contaminated areas are isolated as restricted areas with appropriate radiological protection and access control. Personnel leaving contaminated areas are monitored to ensure they and their clothing are not contaminated. If contamination above acceptable levels is found, they will be decontaminated in accordance with facility procedures. If normal decontamination procedures do not reduce personnel contamination to acceptable levels, the case will be referred to a competent medical authority. Supplies, instruments, and equipment that are in contaminated areas or have been brought into contaminated areas will be monitored prior to removal. If found to be contaminated, they will be decontaminated using normal facility decontamination techniques and facilities or may be disposed of as radwaste. Contaminated vehicles will be decontaminated before being released.
- b. Measures will be taken to control onsite access to potentially contaminated potable water and food supplies. Under emergency conditions when uncontrolled releases of activity have occurred, eating, drinking, smoking, and chewing are prohibited in all facility emergency response facilities until such time as habitability surveys indicate that such activities are permissible.
- c. Restricted areas and contaminated items will be returned to normal use when contamination levels have been returned to acceptable levels. Contamination control criteria for returning areas and items to normal use are contained in the facility procedures.

## **10.0 EMERGENCY NOTIFICATION AND PUBLIC INFORMATION**

### **10.1. Emergency Notification**

The Shift Manager is responsible for the notification of an emergency declaration to the State of New Jersey. Notification is made within 60 minutes after the availability of indications to operators that an EAL threshold has been reached.

The format and contents of the initial message between the facility and State authorities are specified in notification procedures and have been established with the review and agreement of responsible state authorities.

The NJ Office of Emergency Management may request the following information from OCNGS:

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;

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.

### **10.2. Public Information**

Any emergency generates a continuous and intensive demand for up-to-date information. The spokesperson function would typically be performed by Communications personnel. Communication 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. The spokesperson is available for media inquiries and the positional duties include maintaining liaison with local media and coordinating with Federal, State and local emergency response organizations to disseminate appropriate information regarding an emergency at OCNGS. Federal, State and local emergency response organizations maintain the capability to disseminate appropriate information regarding an emergency at OCNGS.

As part of its normal corporate structure, Exelon maintains a corporate communications office that can be called to provide additional resources, as necessary.

## **11.0 MAINTAINING EMERGENCY PREPAREDNESS**

### **11.1. Drills and Exercises**

An exercise tests the execution of the overall facility emergency preparedness and the integration of this preparedness. A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular response function.

Emergency exercises and drills are conducted to test and evaluate the adequacy of emergency facilities, equipment, procedures, communication channels, actions of emergency response personnel, and coordination between offsite organizations and the facility.

A summary of exercises and drills and associated elements is outlined below.

#### **11.1.1. Radiation Emergency Exercises and Drills**

Biennial exercises shall be conducted to test the timing and content of implementing procedures and methods; to test emergency equipment and communication networks; and to ensure that emergency personnel are familiar with their duties. OCNCS offers the following organizations the opportunity to participate to the extent assistance would be expected during an emergency declaration; however, participation is not required:

1. State of New Jersey
2. Local Hospitals
3. Local Fire Departments
4. Law Enforcement
5. Rescue, Inc. Ambulance Service

At least one drill involving a combination of some of the principal functional areas of emergency response shall be conducted in the interval between biennial exercises.

Communication checks with offsite agencies, fire drills, medical drills, radiological monitoring drills and health physics drills are performed as indicated in the following sections.

#### **11.1.2. Communication Tests**

To ensure that emergency communications systems described in Section 6.0 of this plan are operable, communications tests are conducted as outlined below.

1. Communication channels with the state government of New Jersey, is tested monthly. These communications tests will include the aspect of understanding the content of messages.
2. The ENS is tested monthly.
3. The following communication systems, as detailed in Section 6.0 of this plan, are used on a frequent basis, therefore periodic testing of these systems is not necessary:
  - Mobile UHF Radio System

- Facility Intercom System
- Commercial Telephone System

### **11.1.3. Augmentation Drills**

Semi-annual, off hours, unannounced, communications drill, utilizing commercial telephone, to estimate emergency personnel response times. No actual travel is required. Participants provide an estimation of the time it would take to report to their designated ERO position. This drill shall serve to demonstrate the capability to augment the on-shift staff after declaration of an emergency.

### **11.1.4. Fire Drills**

To test and evaluate the response and training of the facility's fire brigade, fire drills are conducted in accordance with the OCNCS Fire Protection Program.

### **11.1.5. Medical Drills**

To evaluate the training of the facility's medical response and offsite medical response (ambulance and hospital), a medical drill is conducted annually with a simulated contaminated injured individual. This drill can be performed as part of an Emergency Plan drill or exercise.

### **11.1.6. Radiological Monitoring Drills**

Facility environs and radiological monitoring drills are conducted annually. These drills include monitoring of accessible areas within the facility and include collection and analysis of airborne sample media, communications, and record keeping performed by members of the emergency team. This drill can be performed as part of an Emergency Plan drill or exercise.

### **11.1.7. Health Physics Drills**

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

### **11.1.8. Security Drills**

The purpose of the security drill is to maintain key skills, specifically the site-specific team skills necessary to mitigate security-based events. Security drills are conducted in accordance with the OCNCS Physical Security Plan.

### **11.1.9. Scenarios**

The EP Specialist is responsible for an Emergency Plan drill or exercise. The EP Specialist's responsibilities include developing the exercise/drill scenario, the accident time sequence, and the selection and training of the Controllers required to evaluate the effectiveness of the OCNCS Emergency Preparedness Program.

A scenario is prepared by the scenario development team (if needed) for each exercise/drill to be conducted. The contents of the scenario include, but are not limited to, the following:

1. Basic objective(s);
2. Date, time period, place and participating organizations;
3. Simulation lists;
4. Time schedule of real and simulated initiating events;
5. A narrative summary describing the conduct of the drill or exercise to include such items as simulated casualties, search and rescue of personnel, deployment of radiological monitoring teams, and public information affairs; and
6. List of Controllers and participants.

The scenarios are designed to allow free play in exercising the decision-making process associated with such emergency response actions as exposure control, emergency classification, and the ERO and additional staff augmentation process.

Security based scenarios to test and evaluate security response capabilities will be conducted in accordance with security drills and exercise procedures and may be conducted during Emergency Plan drills or exercises.

Starting times and pre-notification for exercises are coordinated with and agreed upon by all participating organizations.

#### **11.1.10. Evaluation of Exercises**

To evaluate the performance of participating facility personnel and the adequacy of emergency facilities, equipment and procedures during an exercise, the Exercise Coordinator obtains qualified controllers which includes resources outside the facility to evaluate and critique the exercise.

When feasible, personnel designated as controllers are assigned to an Emergency Plan area germane to their area of expertise. Controllers are provided general instruction concerning their specific observation function. Each controller is requested to observe the implementation of the emergency plan element assigned to him or her, and then to record and report observed inadequacies.

A critique is conducted at the conclusion of the exercise with facility personnel. After the critique, the controllers submit a written evaluation to the Exercise Coordinator in which the exercise performance is evaluated against the objectives. All comments and/or recommendations are documented.

Weaknesses and/or deficiencies identified in an exercise critique are processed in accordance with the site corrective actions program.

### **11.1.11. Emergency Plan Audit**

The OCNGS Emergency Plan is independently audited. The audit is conducted as part of the Quality Assurance Program in accordance with 10 CFR 50.54(t). All aspects of emergency preparedness, including exercise documentation, capabilities, procedures, and interfaces with state and local governments are audited.

## **11.2. Training**

Radiological emergency response training is provided to those who may be called on to assist in an emergency. OCNGS Management is responsible to ensure all members of the Emergency Response Organization receive the required initial training and continuing training.

### **11.2.1. Emergency Response 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. Emergency response personnel in the following categories receive initial training and annual retraining.

### **11.2.2. Emergency Response Organization Training**

Shift Managers/Emergency Directors, Technical Coordinators, and Radiation Protection 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.

- Emergency Action Level Classification
- Dose Assessment
- Federal, State, and local notification procedures
- ERO Augmentation
- Emergency Exposure Control
- Mitigating strategies for a catastrophic loss of spent fuel pool inventory

OCNGS personnel available during emergencies to perform emergency response activities as an extension of their normal duties receive duty specific training. This includes facility on-shift personnel, maintenance, radiation protection, and security personnel. Personnel assigned to liaison with offsite fire departments are trained in accordance with the Fire Protection Program, including mitigating strategies required for a catastrophic loss of SFP inventory. Personnel assigned the responsibility of on-shift first aid shall attend first aid training.

### **11.2.3. General Employee Training**

An overview of the Emergency Plan is given to all personnel allowed unescorted access into the Protected Area at OCNGS. Personnel receive this information during initial and requalification training. This training includes identification of the emergency alarm, the fire alarm and the steps to follow for a facility and site evacuation.

#### **11.2.4. Local Support Services Personnel Training**

Training is offered annually to offsite organizations which may provide specialized services during an emergency at OCNGS (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 their support. Topics of event notification, site access, basic radiation protection and interface activities are included in the training.

#### **11.2.5. Documentation of Training**

OCNGS procedures outline the process to document training of the OCNGS Emergency Response Organization. An Emergency Planning procedure is used to verify training provided to offsite organizations.

### **11.3. Review and Updating of Plan and Procedures**

The Emergency Plan is reviewed at least annually. All recommendations for changes to the Emergency Plan or associated implementing procedures are reviewed in accordance with 10 CFR 50.54(q). The Emergency Plan is submitted to OCNGS's On-Site Safety Review Committee for approval.

Written agreements with outside support organizations and government agencies are evaluated annually to determine if these agreements are still valid. If agreements are not valid, then they are renewed and updated.

Revisions to the Emergency Plan are made in accordance with current regulations and guidelines. Changes to the Emergency Plan are forwarded to organizations and individuals with a responsibility for implementation of the Plan.

Telephone number listings associated with the emergency notification process are verified quarterly.

### **11.4. Maintenance and Inventory of Emergency Equipment and Supplies**

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
- 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.

### 11.5. Responsibility for the Planning Effort

The facility Plant Manager has overall responsibility for implementation of the Emergency Plan at OCNCS. The overall Emergency Plan is maintained by Corporate Emergency Preparedness. The Emergency Preparedness Specialist is assisted by Corporate Emergency Preparedness. The specific duties include, but are not limited to, the following:

1. Revise and update the Emergency Plan;
2. Maintain the Emergency Plan implementing procedures so that they are updated and current with the Emergency Plan;
3. Represent the facility in offsite Emergency Plan interfaces;
4. Represent the facility in NRC emergency planning appraisals and audits; and
5. Maintain drill and exercise documentation and coordinate implementation of corrective actions deemed necessary following drills and exercises.

The Emergency Preparedness Specialist is responsible for maintaining an adequate knowledge of regulations, planning techniques and the latest applications of emergency equipment and supplies.

**APPENDIX 1: REFERENCES**

References consulted in the writing of this E-Plan are listed in this section. With exception of regulatory requirements, inclusion of material on this list does not imply adherence to all criteria or guidance stated in each individual reference.

1. 10 CFR 50.47, "Emergency plans"
2. 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors"
3. 10 CFR 50 Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities"
4. 10 CFR 20, "Standards for Protection Against Radiation"
5. 10 CFR 70, 73, and 100
6. 10 CFR 72.32, "Emergency plan"
7. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, dated November 1980
8. NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73"
9. NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees"
10. NUREG-1567, "Spent Fuel Dry Storage Facilities"
11. NEI 99-01, Revision 6, "Development of Emergency Action Levels for Nuclear Power Plants," dated November 2012
12. EPA 400-R-92-001 "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," dated October 1991 (reprinted May 1992)
13. Exelon Nuclear Defueled Quality Assurance Program (DQAP), NO-DC-10
14. "Federal Bureau of Investigation and Nuclear Regulatory Commission Memorandum of Understanding for Cooperation Regarding Threat, Theft, or Sabotage in U.S. Nuclear Industry," Federal Register, Vol. 44, p. 75535, dated December 20, 1979
15. "Voluntary Assistance Agreement By and Among Electric Utilities involved in Transportation of Nuclear Materials," dated November 1, 1980
16. Comprehensive Environmental Response, Compensation and Liability Act of 1980.
17. American Nuclear Insurers Bulletin #5B (1981), "Accident Notification Procedures for Liability Insureds"
18. Letter from William J. Dircks, Executive Director for Operations, NRC, to Dr. Donald F. Knuth, President KMC, Inc. dated October 26, 1981

**APPENDIX 1: REFERENCES**

19. ANI/MAELU Engineering Inspection Criteria for Nuclear Liability Insurance, Section 6.0, Rev. 1, Emergency Planning
20. NRC RIS 2006-12, "Endorsement of Nuclear Energy Institute Guidance Enhancement to Emergency Preparedness Programs for Hostile Action."
21. NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events"
22. NRC Information Notice 2009-01, "National Response Framework"

**APPENDIX 2: INDEX OF EMERGENCY PLAN IMPLEMENTING PROCEDURES**

<b>Document</b>	<b>Document Title</b>
EP-OC-1001 Addendum 1	PERMANENTLY DEFUELED EMERGENCY ACTION LEVELS AND TECHNICAL BASES
EP-OC-110	ASSESSMENT OF EMERGENCIES
EP-OC-111	EMERGENCY CLASSIFICATION
EP-OC-112	EMERGENCY RESPONSE ORGANIZATION ACTIVATION AND OPERATION
EP-OC-113	PERSONNEL PROTECTIVE ACTIONS
EP-OC-114	NOTIFICATIONS
EP-OC-115	TERMINATION
EP-OC-120	EMERGENCY PLAN ADMINISTRATION
EP-OC -121	EMERGENCY RESPONSE FACILITIES AND EQUIPMENT READINESS
EP-OC -122	DRILLS AND EXERCISE PROGRAM
EP-OC -123	COMPUTER PROGRAMS
EP-OC -124	INVENTORIES AND SURVEILLANCES
TQ-OC -113	ERO TRAINING AND QUALIFICATION

## APPENDIX 3: PROCEDURE CROSS-REFERENCE TO NUREG-0654

NUREG-0654 Criteria	Planning Standard (10 CFR 50.47)	Planning Requirement (Appendix E. IV)	OCNGS PDEP Section
II.A	(b)(1)* Assignment of Responsibility (Organization Control)	A.1*, 2, 4*, 7*	6.0 7.0 Appendix 4
II.B	(b)(2) Onsite Emergency Organization	A.1*,2,4*,9*; C.1*	7.0 9.0
II.C	(b)(3)* Emergency Response Support and Resources	A.6, 7*	7.0 Appendix 4
II.D	(b)(4)* Emergency Classification System	B.1,2; C.1*, 2*	4.0 Addendum 1
II.E	(b)(5)* Notification Methods and Procedures	A.6, 7*; C.1*, 2*; D.1*, 3*; E*	7.0 8.0 10.0 Appendix 3
II.F	(b)(6)* Public Education and Information	C.1*; D.1*, 3*; E*	6.0 8.0 11.0
II.G	(b)(7)* Public Education and Information	A.7*; D.2*	10.0
II.H	(b)(8) Emergency Facilities and Equipment	E*; G	5.0 7.0 8.0 11.0
II.I	(b)(9)* Accident Assessment	A.4*; B.1*; C.2*; E*	5.0 9.0 Addendum 1
II.J	(b)(10)* Protective Response	C.1*; E*; I	9.0
II.K	(b)(11) Radiological Exposure Control	E*	9.0
II.L	(b)(12) Medical and Public Health Support	A.6, 7*; E*	7.0 9.0
II.M	(b)(13) Recovery and Reentry Planning and Post-Accident Operations	H	7.0
II.N	(b)(14) Exercises and Drills	E.9*; F*	11.0
II.O	(b)(15) Radiological Emergency Response Training	F*	7.0 9.0 11.0
II.P	(b)(16) Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans	G	11.0

\* As exempted.

**APPENDIX 4: LIST OF LETTERS OF AGREEMENT****Letters with Corporate Exelon:**Organization/Agreement Type

Department of Energy (DOE) Radiation Emergency Assistance Center/Training Site, REAC/TS (Letter on File)

Medical Consultant

Environmental, Inc. (P.O.)  
Radiological Environmental Monitoring

GE Hitachi Nuclear Energy, BWRs (Letter on File)  
BWR Emergency Support

Landauer, Inc. (P.O.)  
Emergency Dosimetry

Murray & Trettel, Inc. (P.O.)  
Meteorological Support

Teledyne Brown Engineering (P.O.)  
Bioassay Analysis/Radiochemical Analysis

Teledyne Brown Engineering (P.O.)  
Bioassay Analysis/Radiochemical Analysis

National Foam, Inc.  
Fire Foam Supply

State of New Jersey Department of Environmental Protection/Office of Emergency Management (Letter on File)

**Oyster Creek-Specific Letters of Agreement**

The following is a listing of letters of agreement and contracts specific to emergency response activities in support of Oyster Creek Generating Station.

NOTE: While this list reflects letters of agreement currently in effect, it is possible that the list may change for a number of reasons. The EP Specialist will consider the impact that a loss of an agency will have on the emergency response process.

**1. Medical Support Organizations and Personnel**

- Community Medical Center
- Southern Ocean Medical Center

**APPENDIX 4: LIST OF LETTERS OF AGREEMENT**

- Lacey Township First Aid Squad
- Lanoka Harbor First Aid Squad
- Waretown First Aid Squad

**2. Firefighting Organizations**

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

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

**3. Law Enforcement Agencies**

- New Jersey State Police
- Lacey Township Police Department

**APPENDIX 5: GLOSSARY OF TERMS AND ACRONYMS****Glossary of Terms**

Accident Assessment	Accident assessment consists of a variety of actions taken to determine the nature, effects and severity of an accident and includes evaluation of spent fuel cooling and integrity, meteorological observations, seismic observations, fire reports, radiological dose projections, and radiological and environmental monitoring.
Alert Classification	See definition in Section 4.2.
Annual	Frequency of occurrence equal to once per calendar year, January 1 to December 31.
Assessment Actions	Those actions taken during or after an emergency to obtain and process information that is necessary to make decisions to implement specific emergency measures.
Classification	The classification of emergencies is divided into TWO (2) categories or conditions, covering the postulated spectrum of emergency situations. The two (2) emergency classifications (Unusual Event and Alert) are characterized by Emergency Action Levels (EALs) or event initiating conditions and address emergencies of increasing severity.
Corrective Action	Those emergency measures taken to lessen or terminate an emergency situation at or near the source of the problem in order to reduce the magnitude of a radiological release.
Dose Projection	The calculated estimate of a radiation dose to individuals at a given location (normally off-site), determined from the source term/quantity of radioactive material (Q) released, and the appropriate meteorological dispersion parameters (X/Q).
Emergency Action Levels (EALs)	A pre-determined, site-specific, observable threshold for a facility Initiating Condition that places the facility in a given emergency class.
Emergency Preparedness	A state of readiness that provides reasonable assurance that adequate protective measures can and will be taken upon implementation of the E-Plan in the event of a radiological emergency.

**APPENDIX 5: GLOSSARY OF TERMS AND ACRONYMS**

Exercise	An event that tests the integrated capability of a major portion of the basic elements existing within emergency preparedness plans and organizations.
Hostile Action	See Section 6.2 of Addendum 1.
Initiating Condition	See Section 6.2 of Addendum 1.
ISFSI	See Section 6.2 of Addendum 1.
Monthly	Frequency of occurrence equal to once per calendar month.
Off-Site	The area around a nuclear facility that lies outside the station's "site boundary".
Offsite Dose Calculation Manual (ODCM)	The ODCM presents a discussion of the following: <ol style="list-style-type: none"><li>1. The ways in which nuclear power stations can affect their environment radiologically</li><li>2. The regulations which limit radiological effluents from the nuclear power stations; and</li><li>3. The methodology used by the nuclear power stations to assess radiological impact on the environment and compliance with regulations.</li></ol>
On-Site	The area around a nuclear facility that lies within the station's "site boundary".
Plant Operator	Any member of the plant staff who, by virtue of training and experience, is qualified to assess the indications or reports for validity and to compare the same to the EALs in the licensee's emergency classification scheme. A "plant operator" does not encompass plant personnel such as chemists, radiation protection technicians, craft personnel, security personnel, and others whose positions require they report, rather than assess, abnormal conditions to the control room.
Projected Dose	That calculated dose that some individuals in the population group may receive if no protective actions are implemented. Projected doses are calculated to establish an upper limit boundary.
Protected Area	See Section 6.2 of Addendum 1.

**APPENDIX 5: GLOSSARY OF TERMS AND ACRONYMS**

Protective Action	Measures taken to effectively mitigate the consequences of an accident by minimizing the radiological exposure that would likely occur if such actions were not taken.
Release	A ' <i>Release in Progress</i> ' is defined as <u>ANY</u> radioactive release that is a result of, or caused by, the emergency event.
Site Boundary	Oyster Creek's Site Boundary is described in detail in the ODCM.
Site Evacuation	The evacuation of non-essential personnel from the facility site.
Source Term	Radioisotope inventory or amount of radioisotope released to the environment, often as a function of time.
Unusual Event Classification	See definition in Section 4.1.

**APPENDIX 5: GLOSSARY OF TERMS AND ACRONYMS****ACRONYMS**

Any abbreviation followed by a lower case 's' denotes the plural form of the term.

ARM	Area Radiation Monitor
BNE	Bureau of Nuclear Engineering (New Jersey)
CFR	Code of Federal Regulations
CR	Control Room
DEP	Department of Environmental Protection (New Jersey)
DLR	Dosimeter of Legal Record
DOE	U. S. Department of Energy
DOT	U. S. Department of Transportation
DSAR	Defueled Safety Analysis Report
EAL	Emergency Action Level
ENS	Emergency Notification System (NRC)
EPA	U. S. Environmental Protection Agency
GET	General Employee Training
NJ-OEM	New Jersey-Office of Emergency Management
NRC	U. S. Nuclear Regulatory Commission
NRF	National Response Framework
NWS	National Weather Service
OEM	Office of Emergency Management (NJ State Police)
PAG	Protective Action Guide
PDEP	Permanently Defueled Emergency Plan
RMS	Radiation Monitoring System

**Attachment 3**

**OYSTER CREEK NUCLEAR GENERATING STATION**

**DOCKET NUMBERS 50-219 & 72-15**

**LICENSE NUMBER DPR-16**

**PERMANENTLY DEFUELED EMERGENCY ACTION LEVELS**

**AND BASES DOCUMENT**

# **EXELON NUCLEAR**

## **OYSTER CREEK STATION PERMANENTLY DEFUELED EMERGENCY ACTION LEVELS AND TECHNICAL BASES**



**TABLE OF CONTENTS**

1.0	PURPOSE .....	1
2.0	DISCUSSION .....	1
2.1	Permanently Defueled Facility .....	1
2.2	Independent Spent Fuel Storage Installation.....	2
3.0	KEY TERMINOLOGY USED .....	2
3.1	Emergency Classification Levels (ECLs) .....	2
3.2	Initiating Condition (IC) .....	3
3.3	Emergency Action Level (EALs) .....	3
4.0	GUIDANCE ON MAKING EMERGENCY CLASSIFICATIONS .....	3
4.1	General Considerations .....	3
4.2	Classification Methodology .....	4
4.3	Classification of Multiple Events and Conditions .....	4
4.4	Classification of Imminent Conditions .....	5
4.5	Emergency Classification Level Upgrading and Termination.....	5
4.6	Classification of Short-Lived Events .....	5
4.7	Classification of Transient Conditions.....	5
4.8	After-the-Fact Discovery of an Emergency Event or Condition .....	5
4.9	Retraction of an Emergency Declaration .....	6
5.0	REFERENCES .....	7
5.1	Developmental.....	7
5.2	Implementing .....	7
5.3	Commitments .....	7
6.0	ACRONYMS & DEFINITIONS .....	8
6.1	Acronyms .....	8
6.2	Definitions.....	8
7.0	ATTACHMENTS.....	10
	Attachment 1, EAL Matrices .....	10
	Attachment 2, EAL Bases.....	10

## 1.0 PURPOSE

This document provides the detailed set of Emergency Action Levels (EALs) applicable to the Oyster Creek Nuclear Generating Station (OCNGS) and the associated Technical Bases using the EAL development methodology found in NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6 (NEI 99-01, Appendix C, Rev. 6). As a permanently defueled facility, OCNGS will use the Recognition Category "PD" (Permanently Defueled) to provide a site-specific emergency classification scheme including a set of Initiating Conditions (ICs) and EALs associated with the permanently defueled condition and Recognition Category "E" ICs for the ISFSI. Permanently defueled station ICs and EALs are addressed in Appendix C of NEI 99-01, Rev. 6. All recommendations for changes to this document or associated implementing procedures are reviewed in accordance with 10 CFR 50.54(q).

This document should be used to facilitate review of the OCNGS EALs, provide historical documentation for future reference, and serve as a resource for training. Individuals responsible for the classification of events will refer to the ICs and EALs contained in the matrix of this document. They may use the information in the associated "Basis" and "Notes" sections as a reference in support of EAL interpretation. An EAL matrix may be provided as a user aid.

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. Use of this document for assistance is not intended to delay the emergency classification.

## 2.0 DISCUSSION

### 2.1 Permanently Defueled Facility

NEI 99-01, Appendix C, Rev. 6, provides guidance for an emergency classification scheme applicable to a permanently defueled facility. This is a facility that generated spent fuel under a 10 CFR Part 50 license, has permanently ceased operations and will store the spent fuel onsite for an extended period of time. The emergency classification levels applicable to permanently defueled facility are consistent with the requirements of 10 CFR Part 50 and NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Rev. 1" (NUREG-0654).

In order to relax the emergency plan requirements applicable to an operating station, the owner of a permanently defueled station must demonstrate that no credible event can result in a significant radiological release beyond the site boundary. It is expected that this verification will confirm that the source term and motive force available in the permanently defueled condition are insufficient to warrant classifications of a Site Area Emergency or General Emergency.

Therefore, the generic ICs and EALs applicable to a permanently defueled facility may only result in either a Notification of UNUSUAL EVENT (UNUSUAL EVENT) or ALERT classification.

## 2.2 Independent Spent Fuel Storage Installation

Selected guidance in NEI 99-01, Rev. 6, is applicable to licensees electing to use their 10 CFR Part 50 emergency plan to fulfill the requirements of 10 CFR 72.32 for a stand-alone Independent Spent Fuel Storage Installation (ISFSI). The emergency classification levels applicable to an ISFSI are consistent with the requirements of 10 CFR Part 50. The initiating conditions germane to a 10 CFR 72.32 emergency plan (as described in NUREG-1567, "Spent Fuel Dry Storage Facilities") are subsumed within the classification scheme for a 10 CFR 50.47 emergency plan.

The analysis of potential onsite and offsite consequences of accidental releases associated with the operation of an ISFSI is contained in NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees" (NUREG-1140). NUREG-1140 concluded that the postulated worst-case accident involving an ISFSI has insignificant consequences to public health and safety. This evaluation shows that the maximum offsite dose to a member of the public due to an accidental release of radioactive materials would not exceed 1 rem Total Effective Dose Equivalent.

Regarding the above information, the expectations for an offsite response to an ALERT classified under a 10 CFR 72.32 emergency plan are generally consistent with those for an UNUSUAL EVENT in a 10 CFR 50.47 emergency plan (e.g., to provide assistance if requested). Also, the licensee's Emergency Response Organization (ERO) required for 10 CFR 72.32 emergency plan is different from that prescribed for a 10 CFR 50.47 emergency plan (e.g., there is no emergency technical support function required).

## 3.0 KEY TERMINOLOGY USED

There are several key terms that appear throughout the NEI 99-01, Rev. 6, methodology. These terms are introduced in this section to support understanding of subsequent material.

### 3.1 Emergency Classification Levels (ECLs)

One of a set of names or titles established by the U.S. Nuclear Regulatory Commission (NRC) for grouping off-normal events or conditions according to (1) potential or actual effects or consequences, and (2) resulting onsite and offsite response actions. The ECLs that remain applicable to OCNCS, in ascending order of severity, are:

#### 3.1.1 UNUSUAL EVENT(UE)

Events are in progress or have occurred which indicate a potential degradation of the level of safety of the facility or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

**Purpose:** The purpose of this classification is to assure that the first step in future response has been carried out, to bring the operations staff to a state of readiness, and to provide systematic handling of UNUSUAL EVENT information and decision-making.

### 3.1.2 ALERT

Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the facility or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) Protective Action Guides (PAG) exposure levels.

**Purpose:** The purpose of this classification is to assure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required, and provide offsite authorities current information on facility status and parameters.

## 3.2 Initiating Condition (IC)

An event or condition that aligns with the definition of one of the two ECLs by virtue of the potential or actual effects or consequences.

**Discussion:** An IC describes an event or condition, the severity or consequences of which meets the definition of an ECL. An IC can be expressed as a continuous, measurable parameter (e.g., radiation monitor readings) or an event (e.g., an earthquake).

Appendix 1 of NUREG-0654 does not contain example EALs for each ECL, but rather ICs (i.e., conditions that indicate that a radiological emergency, or events that could lead to a radiological emergency, have occurred). NUREG-0654 states that the ICs form the basis for establishment by a licensee of the specific facility instrumentation readings (as applicable) which, if exceeded, would initiate the emergency classification. Thus, it is the specific instrument readings that would be the EALs.

## 3.3 Emergency Action Level (EALs)

A pre-determined, site-specific, observable threshold for an IC that, when met or exceeded, places the facility in a given ECL.

**Discussion:** EAL statements may utilize a variety of criteria including instrument readings and status indications, observable events, results of calculations and analyses, entry into particular procedures, and the occurrence of natural phenomena.

## 4.0 GUIDANCE ON MAKING EMERGENCY CLASSIFICATIONS

### 4.1 General Considerations

When making an emergency classification, the Emergency Director must consider all information having a bearing on the proper assessment of an IC. This includes the EAL plus Notes and the informing Basis information.

All emergency classification assessments should be based upon valid indications, reports or conditions. A valid indication, report, or condition, is one that has been verified through appropriate means such that there is no doubt regarding the indicator's operability, the condition's existence, or the report's accuracy. For example, validation could be accomplished through an instrument channel check, response on related or

redundant indicators, or direct observation by personnel. The validation of indications should be completed in a manner that supports timely emergency declaration.

For ICs and EALs that have a stipulated time duration (e.g., 15 minutes, 60 minutes, etc.), the Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. If an ongoing radiological release is detected and the release start time is unknown, it should be assumed that the release duration specified in the IC/EAL has been exceeded, absent data to the contrary.

A planned work activity that results in an expected event or condition which meets or exceeds an EAL does not warrant an emergency declaration provided that 1) the activity proceeds as planned and 2) the facility remains within the limits imposed by the operating license. Such activities include planned work to test, manipulate, repair, maintain, or modify a system or component. In these cases, the controls associated with the planning, preparation, and execution of the work will ensure that compliance is maintained with all aspects of the operating license provided that the activity proceeds and concludes as expected. Events or conditions of this type may be subject to the reporting requirements of 10 CFR 50.72.

The assessment of some EALs is based on the results of analyses that are necessary to ascertain whether a specific EAL threshold has been exceeded (e.g., gaseous and liquid effluent sampling, etc.); the EAL and/or the associated basis discussion will identify the necessary analysis. In these cases, the declaration period starts with the availability of the analysis results that show the threshold to be exceeded (i.e., this is the time that the EAL information is first available).

While the EALs have been developed to address a full spectrum of possible events and conditions which may warrant emergency classification, a provision for classification based on operator/management experience and judgment is still necessary. The NEI 99-01, Rev. 6, scheme provides the Emergency Director with the ability to classify events and conditions based upon judgment using EALs that are consistent with the ECL definitions (refer to PD-HU3 and PD-HA3). The Emergency Director will need to determine if the effects or consequences of the event or condition reasonably meet or exceed a particular ECL definition.

#### **4.2 Classification Methodology**

To make an emergency classification, the user will compare an event or condition (i.e., the relevant facility indications and reports) to an EAL(s) and determine if the EAL has been met or exceeded. The evaluation of an EAL(s) must be consistent with the Notes. If an EAL has been met or exceeded, then the IC is considered met and the associated ECL is declared in accordance with facility procedures.

When assessing an EAL that specifies a time duration for the off-normal condition, the EAL time duration runs concurrently with the emergency classification time duration.

#### **4.3 Classification of Multiple Events and Conditions**

When multiple emergency events or conditions are present, the user will identify all met or exceeded EALs. The highest applicable ECL identified during this review is declared. For example:

- If an UNUSUAL EVENT EAL and an ALERT EAL are met, an ALERT should be declared.

There is no "additive" effect from multiple EALs meeting the same ECL. For example:

- If two UNUSUAL EVENT EALs are met, an UNUSUAL EVENT should be declared.

Related guidance concerning classification of rapidly escalating events or conditions is provided in Regulatory Issue Summary (RIS) 2007-02, "Clarification of NRC Guidance for Emergency Notifications During Quickly Changing Events."

#### **4.4 Classification of Imminent Conditions**

Although EALs provide specific thresholds, the Emergency Director must remain alert to events or conditions that could lead to meeting or exceeding an EAL within a relatively short period of time (i.e., a change in the ECL is Imminent). If, in the judgment of the Emergency Director, meeting an EAL is Imminent, the emergency classification should be made as if the EAL has been met. While applicable to all ECLs, this approach is particularly important at the higher ECL since it provides additional time for implementation of protective measures.

#### **4.5 Emergency Classification Level Upgrading and Termination**

An ECL may be terminated when the event or condition that meets the IC and EAL no longer exists. Events will not be downgraded.

As noted above, guidance concerning classification of rapidly escalating events or conditions is provided in RIS 2007-02.

#### **4.6 Classification of Short-Lived Events**

Event-based ICs and EALs define a variety of specific occurrences that have potential or actual safety significance. By their nature, some of these events may be short-lived and, thus, over before the emergency classification assessment can be completed. If an event occurs that meets or exceeds an EAL, the associated ECL must be declared regardless of its continued presence at the time of declaration. Examples of such events would be an earthquake or explosion.

#### **4.7 Classification of Transient Conditions**

It is important to stress that the emergency classification assessment period is not a "grace period" during which a classification may be delayed to allow the performance of a corrective action that would obviate the need to classify the event; emergency classification assessments must be deliberate and timely, with no undue delays.

#### **4.8 After-the-Fact Discovery of an Emergency Event or Condition**

In some cases, an EAL may be met but the emergency classification was not made at the time of the event or condition. This situation can occur when personnel discover that an event or condition existed which met an EAL, but no emergency was declared, and the event or condition no longer exists at the time of discovery. This may be due to the event or condition not being recognized at the time or an error that was made in the emergency classification process.

In these cases, no emergency declaration is warranted; however, the guidance contained in NUREG-1022, "Event Report Guidelines 10 CFR 50.72 and 50.73," is applicable. Specifically, the event should be reported to the NRC in accordance with 10 CFR 50.72 within one hour of the discovery of the undeclared event or condition. The licensee should also notify appropriate State and local agencies in accordance with the agreed upon arrangements.

#### **4.9 Retraction of an Emergency Declaration**

Guidance on the retraction of an emergency declaration reported to the NRC is discussed in NUREG-1022.

## 5.0 REFERENCES

### 5.1 Developmental

- 5.1.1 NEI 99-01 Revision 6, Development of Emergency Action Levels for Non-Passive Reactors, November 2012
- 5.1.2 10 CFR Part 50, Domestic Licensing of Production and Utilization Facilities
- 5.1.3 RIS 2007-02, Clarification of NRC Guidance for Emergency Notifications During Quickly Changing Events, February 2007
- 5.1.4 NUREG-1022, Event Reporting Guidelines 10 CFR 50.72 and 50.73
- 5.1.5 10 CFR 50.72, Immediate Notification Requirements for Operating Nuclear Power Reactors
- 5.1.6 NUREG-0654/FEMA-REP-1, Rev. 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants
- 5.1.7 10 CFR 72.32, Emergency Plan
- 5.1.8 NUREG-1567, Spent Fuel Dry Storage Facilities
- 5.1.9 10 CFR 50.47, Emergency Plans
- 5.1.10 NUREG-1140, A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees

### 5.2 Implementing

- 5.2.1 EP-OC-1001, Permanently Defueled Emergency Plan
- 5.2.2 EP-OC-1001, Addendum 1, Emergency Action Levels and Technical Bases
- 5.2.3 EAL Comparison Matrix

### 5.3 Commitments

None

## 6.0 ACRONYMS & DEFINITIONS

### 6.1 Acronyms

ABN .....	Abnormal Operating Procedure
CDE .....	Committed Dose Equivalent
CFR .....	Code of Federal Regulations
cpm .....	Counts per Minute
EAL .....	Emergency Action Level
ECL .....	Emergency Classification Level
EPA .....	Environmental Protection Agency
FAA .....	Federal Aviation Administration
FBI .....	Federal Bureau of Investigation
FEMA .....	Federal Emergency Management Agency
HSM .....	Horizontal Storage Module
ISFSI .....	Independent Spent Fuel Storage Installation
IC.....	Initiating Condition
mRem .....	milli-Roentgen Equivalent Man
MSL .....	Mean Sea Level
NEI .....	Nuclear Energy Institute
NORAD .....	North American Aerospace Defense Command
NRC .....	Nuclear Regulatory Commission
ODCM .....	Off-site Dose Calculation Manual
PAG .....	Protective Action Guide
PD .....	Permanently Defueled
rem .....	Roentgen Equivalent Man
TEDE .....	Total Effective Dose Equivalent
μCi/cc.....	micro Curies per Cubic Centimeter
UFSAR .....	Final Safety Analysis Report as Updated

### 6.2 Definitions

NOTE: Selected terms used in IC and EAL statements are set in all capital letters (e.g., ALL CAPS).

ALERT: Refer to Section 3.1.2.

CONFINEMENT BOUNDARY: The irradiated fuel dry storage cask barrier(s) between areas containing radioactive substances and the environment.

Emergency Action Level (EAL): Refer to Section 3.3.

Emergency Classification Level (ECL): Refer to Section 3.1.

Initiating Condition (IC): Refer to Section 3.2.

**EXPLOSION:** A rapid, violent and catastrophic failure of a piece of equipment due to combustion, chemical reaction or overpressurization. A release of steam (from high energy lines or components) or an electrical component failure (caused by short circuits, grounding, arcing, etc.) should not automatically be considered an explosion. Such events may require a post-event inspection to determine if the attributes of an explosion are present.

**FIRE:** Combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute fire. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

**Hostage:** A person(s) held as leverage against the station to ensure that demands will be met by the station.

**HOSTILE ACTION:** An act toward a Nuclear Power Plant (NPP) or its personnel that includes the use of violent force to destroy equipment, take Hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILES, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the NPP. Non-terrorism-based EALs should be used to address such activities (i.e., this may include violent acts between individuals in the owner controlled area).

**HOSTILE FORCE:** Any individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

**Imminent:** The trajectory of events or conditions is such that an EAL will be met within a relatively short period of time regardless of mitigation or corrective actions.

**INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI):** A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.

**NORMAL LEVELS:** As applied to radiological IC/EALs, the highest reading in the past twenty-four hours excluding the current peak value.

**OWNER CONTROLLED AREA (OCA):** The property associated with the station and owned by the company. Access is normally limited to persons entering for official business.

**PROJECTILE:** An object directed toward a Nuclear Power Plant (NPP) that could cause concern for its continued operability, reliability, or personnel safety.

**PROTECTED AREA:** An area that normally encompasses all controlled areas within the security protected area fence.

SECURITY CONDITION: Any Security Event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel, or a potential degradation to the level of safety of the plant. A SECURITY CONDITION does not involve a HOSTILE ACTION.

UNPLANNED: A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

UNUSUAL EVENT (UE): Refer to Section 3.1.1

VISIBLE DAMAGE: Damage to a component or structure that is readily observable without measurements, testing, or analysis. The visual impact of the damage is sufficient to cause concern regarding the operability or reliability of the affected component or structure.

## **7.0 ATTACHMENTS**

Attachment 1: EAL Matrices

Attachment 2: EAL Bases

Attachment 1 - EALs Matrices

Table PD-1: Recognition Category "PD" Initiating Condition Matrix

UNUSUAL EVENT	ALERT
<b>PD-RU1</b> Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer.	<b>PD-RA1</b> Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRem TEDE or 50 mRem thyroid CDE.
<b>PD-RU2</b> UNPLANNED rise in facility radiation levels.	<b>PD-RA2</b> UNPLANNED rise in facility radiation levels that impedes facility access required to maintain spent fuel integrity.
<b>PD-SU1</b> UNPLANNED spent fuel pool temperature rise.	
<b>PD-HU1</b> Confirmed SECURITY CONDITION or threat.	<b>PD-HA1</b> HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.
<b>PD-HU2</b> Hazardous Event affecting equipment necessary for spent fuel cooling.	
<b>PD-HU3</b> Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT.	<b>PD-HA3</b> Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT.

Table E-1: Recognition Category "E" Initiating Condition Matrix

UNUSUAL EVENT
<b>E-HU1</b> Damage to a loaded cask CONFINEMENT BOUNDARY.

Attachment 1 - EALs Matrices

ALERT		UNUSUAL EVENT	
<b>Abnormal Rad Levels / Radiological Effluents</b>			
<b>Radiological Effluents</b>	<p><b>PD-RA1</b> Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE.</p> <p><b>Emergency Action Level (EAL):</b></p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>● The Emergency Director should declare the ALERT promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</li> <li>● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.</li> <li>● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.</li> <li>● The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.</li> </ul> <ol style="list-style-type: none"> <li>1. Readings on <b>ANY</b> Table R1 Effluent Monitor &gt; <b>Table R1 value</b> for <b>≥ 15 minutes</b>.</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of <b>EITHER</b>:                             <ol style="list-style-type: none"> <li>a. &gt; <b>10 mRem TEDE</b></li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>b. &gt; <b>50 mRem CDE Thyroid</b></li> </ol> </li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than <b>EITHER</b> of the following at or beyond the site boundary                             <ol style="list-style-type: none"> <li>a. <b>10 mRem TEDE for 60 minutes</b> of exposure</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>b. <b>50 mRem CDE Thyroid for 60 minutes</b> of exposure</li> </ol> </li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>4. Field survey results at or beyond the site boundary indicate <b>EITHER</b>:                             <ol style="list-style-type: none"> <li>a. Gamma (closed window) dose rates &gt; <b>10 mR/hr</b> are expected to continue for <b>≥ 60 minutes</b></li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>b. Analyses of field survey samples indicate &gt; <b>50 mRem CDE Thyroid</b> for <b>60 minutes</b> of inhalation.</li> </ol> </li> </ol>	<p><b>PD-RU1</b> Release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM limit for 60 minutes or longer.</p> <p><b>Emergency Action Level (EAL):</b></p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>● The Emergency Director should declare the UNUSUAL EVENT promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded.</li> <li>● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.</li> <li>● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.</li> </ul> <ol style="list-style-type: none"> <li>1. Readings on <b>ANY</b> Table R1 Effluent Monitor &gt; <b>Table R1 value</b> for <b>≥ 60 minutes</b>:</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>2. Sample analyses for gaseous or liquid releases indicates a concentration or release rates &gt; <b>2 times ODCM Limit</b> with a release duration of <b>≥ 60 minutes</b>.</li> </ol>	

Table R1 Effluent Monitor Thresholds			
Release Path		ALERT	UNUSUAL EVENT
<b>Main Stack RAGEMS</b>	HRM = High Range Monitor	110 µCi/cc HRM	3.6 µCi/cc HRM

Attachment 1 - EALs Matrices

<b>ALERT</b>		<b>UNUSUAL EVENT</b>		
<b>Abnormal Rad Levels / Radiological Effluents</b>				
<b>Area Rad Levels</b>	<p><b>PD-RA2</b> UNPLANNED rise in facility radiation levels that impedes facility access required to maintain spent fuel integrity.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>UNPLANNED dose rate &gt; <b>15 mR/hr</b> in <b>ANY</b> of the following areas required for continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:                             <ul style="list-style-type: none"> <li>Control Room</li> <li>Central Alarm Station</li> </ul> </li> <li>UNPLANNED Area Radiation Monitor readings or survey results indicate a rise of &gt; <b>100 mR/hr</b> over <b>NORMAL LEVELS</b> that impedes access to <b>ANY</b> of the following areas needed to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:                             <ul style="list-style-type: none"> <li>119' Reactor Building elevation</li> <li>SFP Cooling Pump /Heat Exchanger area</li> <li>RBCCW Pump / Heat Exchanger area</li> </ul> </li> </ol>	<p><b>PD-RU2</b> UNPLANNED rise in facility radiation levels.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>a. UNPLANNED water level drop in the Spent Fuel Pool as indicated by <b>ANY</b> of the following:                             <ul style="list-style-type: none"> <li>Spent Fuel Pool water level &lt; <b>117' 8"</b> (Fuel Pool Level Lo)</li> <li>Indication or report of a drop in water level.</li> </ul> </li> </ol> <p><b>AND</b></p> <ol style="list-style-type: none"> <li>b. UNPLANNED Area Radiation Monitor reading rise on <b>ANY</b> 119' elevation radiation monitor.</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>2. Area radiation monitor reading or survey result indicates an UNPLANNED rise of <b>25 mR/hr</b> over <b>NORMAL LEVELS</b>.</li> </ol>		

<b>ALERT</b>		<b>UNUSUAL EVENT</b>		
<b>System Malfunctions</b>				
<b>Spent Fuel Pool</b>		<p><b>PD-SU1</b> UNPLANNED Spent Fuel Pool temperature rise.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>UNPLANNED Spent Fuel Pool temperature rise to &gt; <b>125°F</b>.</li> </ol>		

Attachment 1 - EALs Matrices

ALERT		UNUSUAL EVENT	
<b>Hazards and Other Conditions Affecting Facility Safety</b>			
<b>Hostile Action</b>	<p><b>PD-HA1</b> HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>1. A validated notification from NRC of an aircraft attack threat &lt; <b>30 minutes</b> from the site.</li> </ol> <p style="text-align: center;"><b>OR</b></p> <ol style="list-style-type: none"> <li>2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA.</li> </ol>	<b>PD-HU1</b>	<p>Confirmed SECURITY CONDITION or threat.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities.</li> </ol> <p style="text-align: center;"><b>OR</b></p> <ol style="list-style-type: none"> <li>2. A validated notification from the NRC providing information of an aircraft threat.</li> </ol> <p style="text-align: center;"><b>OR</b></p> <ol style="list-style-type: none"> <li>3. Notification by the Security Force of a SECURITY CONDITION that does <b>not</b> involve a HOSTILE ACTION.</li> </ol>
<b>Hazardous Event</b>		<b>PD-HU2</b>	<p>Hazardous Event affecting equipment necessary for spent fuel cooling.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>1. a. The occurrence of <b>ANY</b> of the following hazardous events: <ul style="list-style-type: none"> <li>• Seismic event (earthquake)</li> <li>• Internal or external flooding event</li> <li>• High winds or tornado strike</li> <li>• FIRE</li> <li>• EXPLOSION</li> <li>• Extreme High or Low Tides</li> <li>• Other events with similar hazard characteristics as determined by the Shift Manager</li> </ul> </li> </ol> <p style="text-align: center;"><b>AND</b></p> <ol style="list-style-type: none"> <li>b. The event has damaged at least one train of a system needed for Spent Fuel Cooling</li> </ol> <p style="text-align: center;"><b>AND</b></p> <ol style="list-style-type: none"> <li>c. The damaged train(s) cannot, or potentially cannot, perform its design function based on <b>EITHER</b>: <ul style="list-style-type: none"> <li>• Indications of degraded performance</li> <li>• VISIBLE DAMAGE</li> </ul> </li> </ol>

Attachment 1 - EALs Matrices

<b>ALERT</b>		<b>UNUSUAL EVENT</b>	
<b>Hazards and Other Conditions Affecting Facility Safety</b>			
<b>Emergency Director Judgment</b>	<p><b>PD-HA3</b> Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>Other conditions exist which, in the judgment of the Emergency Director, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the facility or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.</li> </ol>	<p><b>PD-HU3</b> Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the facility or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of equipment required for spent fuel cooling occurs.</li> </ol>	

<b>ALERT</b>		<b>UNUSUAL EVENT</b>	
<b>ISFSI Malfunction</b>			
<b>ISFSI</b>		<p><b>E-HU1</b> Damage to a loaded cask CONFINEMENT BOUNDARY.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by a radiation reading: <ul style="list-style-type: none"> <li>&gt; <b>1400 mRem/hr</b> (gamma + neutron) on the Horizontal Storage Module (HSM) front surface (applicable to type 1 61BTH DSC only)</li> <li><b>OR</b></li> <li>&gt; <b>800 mRem/hr</b> (gamma + neutron) 3 feet from the HSM surface (applicable to 61BT DSC only)</li> <li><b>OR</b></li> <li>&gt; <b>200 mRem/hr</b> (gamma + neutron) outside the HSM door on centerline of DSC</li> <li><b>OR</b></li> <li>&gt; <b>40 mRem/hr</b> (gamma + neutron) end of shield wall exterior</li> </ul> </li> </ol>	

**Attachment 2 - EAL Bases****Recognition Category PD EAL Basis**

Recognition Category PD provides a stand-alone set of ICs/EALs for a Permanently Defueled nuclear facility to consider for use in developing a site-specific emergency classification scheme. For development, it was assumed that the plant had operated under a 10 CFR Part 50 license and that the operating company has permanently ceased plant operations. Further, the company intends to store the spent fuel within the plant for some period of time.

When in a permanently defueled condition, the plant licensee typically receives approval from the NRC for exemption from specific emergency planning requirements. These exemptions reflect the lowered radiological source term and risks associated with spent fuel pool storage relative to reactor at-power operation. Source terms and accident analyses associated with plausible accidents are documented in the station's Final Safety Analysis Report (FSAR), as updated. As a result, each licensee will need to develop a site-specific emergency classification scheme using the NRC-approved exemptions, revised source terms, and revised accident analyses as documented in the station's FSAR.

Recognition Category PD uses the same ECLs as operating reactors; however, the source term and accident analyses limit the ECLs to an UNUSUAL EVENT and ALERT. The UNUSUAL EVENT ICs provide for an increased awareness of abnormal conditions while the ALERT ICs are specific to actual or potential impacts to spent fuel. The source terms and release motive forces associated with a permanently defueled facility would not be sufficient to require declaration of a Site Area Emergency or General Emergency.

A permanently defueled facility is essentially a spent fuel storage facility with the spent fuel stored in a pool of water that serves as both a cooling medium (i.e., removal of decay heat) and shield from direct radiation. These primary functions of the spent fuel storage pool are the focus of the Recognition Category PD ICs and EALs. Radiological effluent IC and EALs were included to provide a basis for classifying events that cannot be readily classified based on an observable events or facility conditions alone.

In NEI 99-01, Rev. 6, appropriate ICs and EALs from Recognition Categories A, C, F, H, and S were modified and included in Recognition Category PD to address a spectrum of the events that may affect a spent fuel pool. The Recognition Category PD ICs and EALs reflect the relevant guidance in this document (e.g., the importance of avoiding both over-classification and under-classification). OCNGS has developed this emergency classification scheme using the NRC-approved exemptions, and site-specific source terms, and accident analyses. Security-related events are also included.

The following table, Table PD-1: Recognition Category "PD" Initiating Condition Matrix, provides a summary of initiating conditions associated with Recognition Category PD.

**Recognition Category E EAL Basis**

Recognition Category E provides a set of ICs/EALs for an ISFSI. An ISFSI is a complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage. A significant amount of the

**Attachment 2 - EAL Bases**

radioactive material contained within a cask must escape its packaging and enter the atmosphere for there to be a significant environmental effect resulting from an accident involving the dry storage of spent nuclear fuel. Formal offsite planning is not required because the postulated worst-case accident involving an ISFSI has insignificant consequences to the public health and safety.

An UNUSUAL EVENT is declared on the basis of the occurrence of an event of sufficient magnitude that a loaded cask confinement boundary is damaged or violated. This includes classification based on a loaded fuel storage cask confinement boundary loss leading to the degradation of the fuel during storage or posing an operational safety problem with respect to its removal from storage.

## Attachment 2 - EAL Bases

## PD-RA1

**Initiating Condition:**

Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRem TEDE or 50 mRem thyroid CDE.

**Emergency Action Level (EAL):****Notes:**

- The Emergency Director should declare the ALERT promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

1. Readings on **ANY** Table R1 Effluent Monitor > **Table R1 value** for **≥ 15 minutes**.

**OR**

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**:

a. > 10 mRem TEDE

**OR**

b. > 50 mRem CDE Thyroid

**OR**

3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than **EITHER** of the following at or beyond the site boundary

a. 10 mRem TEDE for 60 minutes of exposure

**OR**

b. 50 mRem CDE Thyroid for 60 minutes of exposure

**OR**

Attachment 2 - EAL Bases

PD-RA1 (cont)

**Emergency Action Level (EAL) (cont):**

- 4. Field survey results at or beyond the site boundary indicate **EITHER**:
  - a. Gamma (closed window) dose rates > **10 mR/hr** are expected to continue for **≥ 60 minutes**
  - OR**
  - b. Analyses of field survey samples indicate > **50 mRem CDE Thyroid** for **60 minutes** of inhalation.

<b>Table R1 Effluent Monitor Thresholds</b>	
<b>Effluent Monitor</b>	<b>ALERT</b>
<b>Main Stack RAGEMS</b>	110 µCi/cc HRM
HRM = High Range Monitor	

**Basis:**

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

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of facility conditions alone. The inclusion of both facility condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the EPA PAG of 1000 mRem while the 50 mRem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

The radwaste liquid discharge system is currently closed off with a facility modification installed blank flange. To perform a discharge would require a facility modification to remove the flange. Since the liquid radwaste system is not operable, no EAL threshold has been developed for this release point.

Attachment 2 - EAL Bases

**PD-RA1 (cont)**

**Basis Reference(s):**

1. NEI 99-01 Rev 6, PD-AA1
2. EP-EAL-0610, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Oyster Creek Generating Station
3. CY-OC-170-301, Offsite Dose Calculation Manual for Oyster Creek
4. ABN-27, Inadvertent Overboard Radioactive Release or Cross Contamination
5. EP-EAL-0617, Oyster Creek Criteria for Choosing Liquid Effluent EAL Threshold Values

## Attachment 2 - EAL Bases

PD-RU1

**Initiating Condition:**

Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer.

**Emergency Action Level (EAL):****Notes:**

- The Emergency Director should declare the UNUSUAL EVENT promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

1. Readings on **ANY** Table R1 Effluent Monitor > **Table R1 value** for **≥ 60 minutes**:

Table R1 Effluent Monitor Thresholds	
Effluent Monitor	UNUSUAL EVENT
Main Stack RAGEMS	3.6 $\mu\text{Ci/cc}$ HRM
HRM = High Range Monitor	

OR

2. Sample analyses for gaseous or liquid releases indicate a concentration or release rates > **2 times ODCM Limit** with a release duration of **≥ 60 minutes**.

**Basis:**

This IC addresses a potential decrease in the level of safety of the facility 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 un-monitored, including those for which a radioactivity discharge permit is normally prepared.

OCNGS incorporated design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.

## Attachment 2 - EAL Bases

**PD-RU1 (cont)**

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of facility conditions alone. The inclusion of both facility condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.

The radwaste liquid discharge system is currently closed off with a facility modification installed blank flange. To perform a discharge would require a facility modification to remove the flange. Since the liquid radwaste system is not operable, no EAL threshold has been developed for this release point.

**EAL #1 Basis**

This EAL addresses limits to radioactive releases that could occur through normal reactor building ventilation effluent pathway.

**EAL #2 Basis**

This EAL addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys, particularly on unmonitored pathways (e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.).

Escalation of the emergency classification level would be via IC PD-RA1.

**Basis Reference(s):**

1. NEI 99-01 Rev 6, PD-AU1
2. EP-EAL-0610, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Oyster Creek Generating Station
3. CY-OC-170-301, Offsite Dose Calculation Manual for Oyster Creek
4. ABN-27, Inadvertent Overboard Radioactive Release or Cross Contamination

## Attachment 2 - EAL Bases

## PD-RA2

**Initiating Condition:**

UNPLANNED rise in facility radiation levels that impedes facility access required to maintain spent fuel integrity.

**Emergency Action Level (EAL):**

1. UNPLANNED dose rate > **15 mR/hr** in **ANY** of the following areas required for continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:
  - Control Room
  - Central Alarm Station
2. UNPLANNED Area Radiation Monitor readings or survey results indicate a rise of > **100 mR/hr** over NORMAL LEVELS that impedes access to **ANY** of the following areas needed to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:
  - 119' Reactor Building elevation
  - SFP Cooling Pump /Heat Exchanger area
  - RBCCW Pump / Heat Exchanger area

**Basis:**

This IC addresses increased radiation levels that impede necessary access to areas containing equipment that must be operated manually or that requires 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 facility access. It is this impaired access that results in the actual or potential substantial degradation of the level of safety of the facility.

This IC does not apply to anticipated temporary increases due to planned events.

This IC addresses elevated radiation levels in certain facility rooms/areas sufficient to preclude or impede personnel from performing actions necessary to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity. As such, it represents an actual or potential substantial degradation of the level of safety of the facility.

Assuming all facility equipment is operating as designed, normal operation is capable from the Control Room (CR). The areas listed in EAL-2 are facility areas that contain equipment which require a manual/local action necessary when moving fuel or manipulating SFP cooling equipment.

Attachment 2 - EAL Bases

**PD-RA2 (cont)**

**Basis Reference(s):**

1. NEI 99-01 Rev 6, PD-AA2

## Attachment 2 - EAL Bases

## PD-RU2

**Initiating Condition:**

UNPLANNED rise in facility radiation levels.

**Emergency Action Level (EAL):**

1. a. UNPLANNED water level drop in the Spent Fuel Pool as indicated by **ANY** of the following:
  - Spent Fuel Pool water level < **117' 8"** (Fuel Pool Level Lo)
  - Indication or report of a drop in water level.

**AND**

  - b. UNPLANNED Area Radiation Monitor reading rise on **ANY** 119' elevation area rad monitor.

**OR**
2. Area radiation monitor reading or survey result indicates an UNPLANNED rise of **25 mR/hr** over NORMAL LEVELS.

**Basis:**

This IC addresses a loss in water level above irradiated fuel sufficient to cause elevated radiation levels. This condition could be a precursor to a more serious event and is also indicative of a minor loss in the ability to control radiation levels within the facility. It is therefore a potential degradation in the level of safety of the facility

A water level loss will be primarily determined by indications from available level instrumentation. Other sources of level indications may include reports from facility personnel (e.g., from a refueling crew) or video camera observations (if available) or from any other temporarily installed monitoring instrumentation. A significant drop in the water level may also cause a rise in the radiation levels of adjacent areas that can be detected by monitors in those locations.

The effects of planned evolutions should be considered. Note that EAL #1 is applicable only in cases where the elevated reading is due to an UNPLANNED water level drop. EAL #2 excludes radiation level increases that result from planned activities such as use of radiographic sources and movement of radioactive waste materials.

Spent Fuel Pool (SFP) water level setpoint is less than 117' 8" (mean sea level), which corresponds to the SFP low level alarm. This indication is readily available to the control room operators and indicated on the plant computer system. The level corresponds to 21' 6 7/8" above the top of fuel assemblies. Digital level indication is also available to the hundredth position and the instrument is accurate to  $\pm 0.25'$ .

Escalation of the emergency classification level would be via IC PD-RA1 OR PD-RA2.

Attachment 2 - EAL Bases

**PD-RU2 (cont)**

**Basis Reference(s):**

1. NEI 99-01 Rev 6, PD-AU2
2. RP-AA-203 Exposure Control and Authorization
3. RAP-G-7-a, SKM SRG TNK LVL LO-LO
4. FSAR Figure 7.6-3
5. NRC Order EA-12-051
6. NEI 12-02

## Attachment 2 - EAL Bases

## PD-SU1

**Initiating Condition:**

UNPLANNED spent fuel pool temperature rise.

**Emergency Action Level (EAL):**

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

**Basis:**

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 irradiate fuel is stored in the spent fuel pool, the pool water temperature shall be maintained below 125°F (Reference 2).

Escalation of the emergency classification level would be via PD-RA1 or PD-RA2

**Basis Reference(s):**

1. NEI 99-01 Rev 6, PD-SU1
2. OCNCS Technical Specifications

## Attachment 2 - EAL Bases

## PD-HA1

**Initiating Condition:**

HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.

**Emergency Action Level (EAL):**

1. A validated notification from NRC of an aircraft attack threat < **30 minutes** from the site.

**OR**

2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA.

**Basis:**

This IC addresses the notification of an aircraft attack threat or an occurrence of a HOSTILE ACTION within the OWNER CONTROLLED AREA. 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 facility and staff for a potential aircraft impact.

Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event.

Security plans and terminology are based on the guidance provided by NEI 03-12, *Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program]*.

As time and conditions allow, these events require a heightened state of readiness by the facility staff and implementation of onsite protective measures (e.g., evacuation, dispersal or sheltering). The ALERT declaration will also heighten the awareness of Offsite Response Organizations (ORO), allowing them to be better prepared should it be necessary to consider further actions.

This IC does not apply to incidents that are accidental events, acts of civil disobedience, or otherwise are not a HOSTILE ACTION perpetrated by a HOSTILE FORCE. Examples include the crash of a small aircraft, shots from hunters, physical disputes between employees, etc. Reporting of these types of events is adequately addressed by other EALs, or the requirements of 10 CFR § 73.71 or 10 CFR § 50.72.

## Attachment 2 - EAL Bases

## PD-HA1 (cont)

**Basis (cont):****EAL #1 Basis**

The EAL addresses the threat from the impact of an aircraft on the facility, and the anticipated arrival time is within 30 minutes. The intent of this EAL is to ensure that threat-related notifications are made in a timely manner so that facility personnel and OROs are in a heightened state of readiness. This EAL is met when the threat-related information has been validated in accordance with ABN-41, Security Event.

The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may be provided by NORAD through the NRC.

In some cases, it may not be readily apparent if an aircraft impact within the OWNER CONTROLLED AREA was intentional (i.e., a HOSTILE ACTION). It is expected, although not certain, that notification by an appropriate Federal agency to the site would clarify this point. In this case, the appropriate federal agency is intended to be NORAD, FBI, FAA or NRC. The emergency declaration, including one based on other ICs/EALs, should not be unduly delayed while awaiting notification by a Federal agency.

**EAL #2 Basis**

This EAL is applicable for any HOSTILE ACTION occurring, or that has occurred, in the OWNER CONTROLLED AREA. This includes any action directed against an ISFSI that is located outside the facility PROTECTED AREA.

**Basis Reference(s):**

1. NEI 99-01 Rev 6, PD-HA1
2. Station Security Plan – Appendix C
3. ABN-41, Security Event

## Attachment 2 - EAL Bases

## PD-HU1

**Initiating Condition:**

Confirmed SECURITY CONDITION or threat.

**Emergency Action Level (EAL):**

1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities.  
**OR**
2. A validated notification from the NRC providing information of an aircraft threat.  
**OR**
3. Notification by the Security Force of a SECURITY CONDITION that does **not** involve a HOSTILE ACTION.

**Basis:**

This IC addresses events that pose a threat to facility personnel or spent fuel cooling system equipment, and thus represent a potential degradation in the level of facility safety. Security events which do not meet one of these EALs are adequately addressed by the requirements of 10 CFR § 73.71 or 10 CFR § 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under ICs PD-HA1.

Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event. Classification of these events will initiate appropriate threat-related notifications to facility personnel and OROs.

Security plans and terminology are based on the guidance provided by NEI 03-12, *Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program]*.

**EAL #1 Basis**

Addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with SY-AA-101-132.

**EAL #2 Basis**

Addresses the threat from the impact of an aircraft on the facility. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may also be provided by NORAD through the NRC. Validation of the threat is performed in accordance with ABN-41, Security Event.

## Attachment 2 - EAL Bases

**PD-HU1 (cont)****Basis (cont):****EAL #3 Basis**

References Security Force because these are the individuals trained to confirm that a security event is occurring or has occurred. Training on security event confirmation and classification is controlled due to the nature of Safeguards and 10 CFR § 2.39 information.

Escalation of the emergency classification level would be via IC PD-HA1.

**Basis Reference(s):**

1. NEI 99-01 Rev 6, PD-HU1
2. Station Security Plan – Appendix C
3. ABN-41, Security Event
4. SY-AA-101-132, Security Assessment and Response to Unusual Activities

## Attachment 2 - EAL Bases

## PD-HU2

**Initiating Condition:**

Hazardous Event affecting equipment necessary for spent fuel cooling.

**Emergency Action Level (EAL):**

1. a. The occurrence of ANY of the following hazardous events:
  - Seismic event (earthquake)
  - Internal or external flooding event
  - High winds or tornado strike
  - FIRE
  - EXPLOSION
  - Extreme High or Low Tides
  - Other events with similar hazard characteristics as determined by the Shift Manager
- AND**
- b. The event has damaged at least one train of a system needed for Spent Fuel Cooling
- AND**
- c. The damaged train(s) cannot, or potentially cannot, perform its design function based on **EITHER**:
  - Indications of degraded performance
  - VISIBLE DAMAGE

**Basis:**

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.

For the first bullet in EAL 1.c, indications of degraded performance apply to in service/operating systems or components that are needed for spent fuel cooling.

## Attachment 2 - EAL Bases

**PD-HU2 (cont)**

For the second bullet in EAL 1.c, VISIBLE DAMAGE applies to equipment needed for spent fuel cooling that is not in service/operating or readily apparent through indications alone. Operators will make this determination based on the totality of available event and damage report information. This is intended to be a brief assessment not requiring lengthy analysis or quantification of the damage.

Escalation of the emergency classification level could, depending upon the event, be based on any of the ALERT ICs: PD-RA1, PD-RA2, PD-HA1 or PD-HA3.

**Basis Reference(s):**

1. NEI 99-01, Rev 6, PD-HU2
2. FSAR Update 3.3.1 (High winds)
3. ABN-31, High Winds
4. ABN-32, Abnormal Intake Level

## Attachment 2 - EAL Bases

## PD-HA3

**Initiating Condition:**

Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT.

**Emergency Action Level (EAL):**

1. Other conditions exist which, in the judgment of the Emergency Director, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the facility or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

**Basis:**

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for an ALERT.

**Basis Reference(s):**

1. NEI 99-01, Rev 6, PD-HA3

## Attachment 2 - EAL Bases

## PD-HU3

**Initiating Condition:**

Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT.

**Emergency Action Level (EAL):**

1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the facility or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of equipment required for spent fuel cooling occurs.

**Basis:**

This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for an UNUSUAL EVENT.

**Basis Reference(s):**

1. NEI 99-01, Rev 6, PD-HU3

## Attachment 2 - EAL Bases

## E-HU1

**Initiating Condition**

Damage to a loaded cask CONFINEMENT BOUNDARY.

**Emergency Action Level (EAL):**

1. Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by a radiation reading:
  - > **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/hr** (gamma + neutron) end of shield wall exterior

**Basis:**

This IC 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 word cask, as used in this EAL, refers to the storage container in use at the site for dry storage of irradiated fuel. The issues of concern are the creation of a potential or actual release path to the environment, degradation of any fuel assemblies' due to environmental factors, and configuration changes which could cause challenges in removing the cask or fuel from storage.

The existence of "damage" is determined by radiological survey. The cask technical specification multiple of "2 times", which is also used in Recognition Category R IC PD-RU1, is used here to distinguish between non-emergency and emergency conditions. The emphasis for this classification is the degradation in the level of safety of the spent fuel cask and not the magnitude of the associated dose or dose rate. It is recognized that in the case of extreme damage to a loaded cask, the fact that the "on-contact" dose rate limit is exceeded may be determined based on measurement of a dose rate at some distance from the cask.

Security-related events for ISFSIs are covered under ICs PD-HU1 and PD-HA1.

**Basis Reference(s):**

1. NEI 99-01, Rev 6, E-HU1

**Attachment 4**

**OYSTER CREEK NUCLEAR GENERATING STATION**

**DOCKET NUMBERS 50-219 & 72-15**

**LICENSE NUMBER DPR-16**

**COMPARISON MATRIX FOR PERMANENTLY DEFUELED  
EALS BASED ON NEI 99-01, "DEVELOPMENT OF  
EMERGENCY ACTION LEVELS FOR NON-PASSIVE  
REACTORS," REVISION 6**

**COMPARISON DOCUMENT FOR PERMANENTLY DEFUELED EALS BASED  
UPON NUCLEAR ENERGY INSTITUTE (NEI) 99-01,  
"METHODOLOGY FOR DEVELOPMENT OF EMERGENCY  
ACTION LEVELS," REVISION 6**

**Description of the Permanently Defueled EAL Technical Basis Document**

The following provides a description of the Oyster Creek Nuclear Generating Station (OCNGS) Emergency Action Level (EAL) Technical Bases Document (provided as Attachment 3 to this submittal). Differences between the OCNGS Permanently Defueled (PD) EALs Technical Bases Document and NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6 (herein referred to as "NEI 99-01") are discussed herein. Also included are the results of a comparison of the OCNGS EAL matrix against the corresponding information contained in NEI 99-01.

**1.0 Purpose**

The OCNGS EAL Technical Bases Document includes reference to the Recognition Category "PD" based on the facility's permanently shut down and defueled condition, providing a stand-alone set of Initiating Conditions (ICs)/EALs for a permanently defueled (PD) nuclear power facility and Recognition Category "E" ICs for the Independent Spent Fuel Storage Installation (ISFSI). A comparison between the "Purpose" section in Attachment 3 and NEI 99-01 was not made.

**2.0 Discussion**

The "Discussion" section in Attachment 3 was developed based on information contained in NEI 99-01, Section 1, "Regulatory Background." This section provides specific criteria for an ISFSI as it pertains to other regulations as well as guidance in NEI 99-01.

NEI 99-01, Section 1.1, "Operating Reactors," was excluded as it pertains to operating reactors. By December 31, 2019, OCNGS will cease operations and fuel will be permanently removed from the reactor vessel and placed in the spent fuel pool. Pursuant to 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for OCNGS will no longer authorize operation of the reactor or emplacement or retention of fuel in the reactor vessel. The OCNGS PD EALs will be implemented after Exelon has certified to the U.S. Nuclear Regulatory Commission (NRC) that OCNGS has permanently ceased power operations and all fuel has been permanently moved to the spent fuel pool. Therefore, NEI 99-01 Section 1.1 is not applicable to OCNGS.

NEI 99-01, Section 1.2, "Permanently Defueled Station," is addressed in Section 2.1 of Attachment 3. Inclusion of this discussion is appropriate because as discussed in detail in Attachment 1 of this submittal, analyses have been completed that demonstrate that no credible event can result in a significant radiological release beyond the site boundary.

NEI 99-01, Section 1.3, "Independent Spent Fuel Storage Installation (ISFSI)," is addressed in Section 2.2 of Attachment 3. Inclusion of this discussion is appropriate because an ISFSI is currently maintained at OCNGS.

NEI 99-01, Section 1.4, "NRC Order EA-12-051," was excluded because the recommendation applies to EALs IC AA2, and new ICs AS2 and AG2, which are only applicable to operating plants and have not been recommended to be include in the permanently defueled EALs. The guidance for the spent fuel pool EALs is applied from Appendix C, which address a permanently defueled condition. Therefore, the discussion of Section 1.4 has not been included.

NEI 99-01, Section 1.5, "Applicability to Advanced and Small Modular Reactor Designs," was excluded because OCNGS is not an Advanced or Small Modular Reactor Design.

### **3.0 Key Terminology Used**

This section in Attachment 3 was developed based on information contained in NEI 99-01, Section 2, "Key Terminology Used in NEI 99-01." Differences between the OCNGS PD EALs Technical Bases Document and NEI 99-01 are discussed below.

- References to Site Area Emergency and General Emergency were removed throughout. Emergency Classification Levels only include Notification of Unusual Event (Unusual Event) and Alert. EALs were developed using NEI 99-01, Appendix C, for the Permanently Defueled Station ICs/EALs and Section 8 for Independent Spent Fuel Storage Installation (ISFSI).
- References to "plant" have been revised to "facility" to indicate that OCNGS is no longer an operating nuclear power plant.
- In Attachment 3, Section 3.2, "Initiating Condition (IC)" (Section 2.2 of NEI 99-01), references to Reactor Coolant System (RCS) Leakage and fission product barriers were removed. Upon permanent removal of fuel from the reactor, the RCS and Containment will no longer be considered fission product barriers because the reactor will be permanently defueled and Containment integrity is not needed for the spent fuel pool.
- NEI 99-01, Section 2.4, "Fission Product Barrier Threshold," was excluded for reasons previously identified related to fission product barriers.

### **4.0 Guidance on Making Emergency Classifications**

This section in Attachment 3 was developed based on information contained in NEI 99-01, Section 5, "Guidance on Making Emergency Classifications." Differences between the OCNGS PD EAL Technical Bases Document and NEI 99-01 are discussed below.

- In Section 4.1 (Section 5.1 of NEI 99-01), references to fission product barrier thresholds were removed as the RCS and Containment no longer serve as fission product barriers.
- In Section 4.1 (Section 5.1 of NEI 99-01), the second paragraph of NEI 99-01 stating "regulations require the licensee to establish and maintain the capability to assess, classify and declare an emergency condition within 15 minutes," was excluded. As detailed in Interim Staff Guidance NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Plants," "...the staff concludes that a decommissioning power reactor is not required to assess, classify, and declare an emergency condition within 15 minutes." OCNGS will maintain the ability to assess, classify, and declare an emergency within

30 minutes. An emergency declaration is required to be made as soon as conditions warranting classification are present and recognizable in accordance with the EALs, but within 30 minutes in all cases after the availability of indications to operators that an EAL threshold has been reached.

- With respect to the notification of an emergency declaration to state and local authorities, as discussed in Attachment 1 of this submittal, no design basis accident or reasonably conceivable beyond design basis accident will be expected to result in radioactive releases that will exceed Environmental Protection Agency (EPA) Protective Action Guides (PAGs) beyond the site boundary. Exelon will maintain EPA PAG as specified in the current and proposed OCNGS Emergency Plan. In the permanently defueled condition, the rapidly developing scenarios associated with events initiated during reactor power operation are no longer credible. The radiological consequences resulting from the only remaining events (e.g., loss of SFP cooling) develop over a significantly longer period. As such, a 15-minute notification requirement is unnecessarily restrictive. A time of sixty (60) minutes after the availability of indications to operators that an EAL threshold has been reached has been negotiated with the State of New Jersey and provides a reasonable amount of time to notify the state and local governmental authorities.
- In Section 4.2 (Section 5.2 in NEI 99-01), reference to Operating Mode Applicability was removed because Operating Modes are not applicable in a permanently defueled facility.
- NEI 99-01, Section 5.4 was excluded because mode changes during classification are not applicable to a permanently defueled facility.
- In Section 4.3 (Section 5.3 of NEI 99-01), references to two units were removed because OCNGS is a single unit site.
- In Section 4.4 (Section 5.5 of NEI 99-01), the word "levels" was changed to "level" because there is only one higher emergency classification level (ECL) above an Unusual Event for a permanently defueled facility.
- In Section 4.5 (Section 5.6 of NEI 99-01), references to Site Area Emergency and General Emergency were removed. Site Area Emergency and General Emergency are no longer credible emergency classifications because analyses have been developed indicating that, 12 months after shutdown, no credible accident at OCNGS will result in radiological releases requiring offsite protective actions. OCNGS will not downgrade events.
- In Section 4.6 (Section 5.7 of NEI 99-01) references to an operating plant short-lived event (e.g., reactor trip) were removed and replaced with verbiage applicable to a permanently defueled facility. Example was changed to an "explosion" since the example given in NEI 99-01, "failure of the reactor protection system to automatically scram/trip the reactor followed by a successful manual scram/trip" is not possible in a permanently defueled facility.
- In Section 4.7 (Section 5.8 of NEI 99-01) the discussion for classifying an event occurring during transient conditions was removed because such a case

occurring is unlikely and Exelon would prefer the Emergency Director classify the event than rely on engineering judgement. The example was removed because an emergency declaration associated with an ATWS or the potential loss of both the fuel clad and RCS is no longer credible at OCNGS. The reference to the 15-minute emergency classification was excluded for reasons presented above.

## **5.0 References**

This section in Attachment 3 was added to provide Developmental and Implementing References applicable to the OCNGS EAL Technical Bases Document. No corresponding section is included in NEI 99-01.

## **6.0 Acronyms & Definitions**

This section in Attachment 3 was developed based on the information presented in Appendices A and B of NEI 99-01. The section incorporates only those acronyms and definitions used in the OCNGS EAL Technical Bases Document.

- The following definitions, included in NEI 99-01, were excluded because they are not used in the OCNGS PD EAL Technical Bases Document:
  - General Emergency
  - Site Area Emergency
- The following key term necessary for overall understanding of the NEI 99-01 emergency classification scheme was excluded because it is not used in the OCNGS PD EAL Technical Bases Document:
  - Fission Product Barrier Threshold
- The key term, Initiating Condition (IC), was revised to change "four emergency classification levels" to "two emergency classification levels because Site Area Emergency and General Emergency are not used in the OCNGS PD EAL Technical Bases Document.
- The key term, Emergency Classification Level, was revised to exclude reference to Site Area Emergency and General Emergency because they are not used in the OCNGS PD EAL Technical Bases Document.

Selected terms used in Initiating Condition and Emergency Action Level statements are set in all capital letters (e.g., ALL CAPS). These words are defined terms that have specific meanings as used in NEI 99-01. Definitions not used in the OCNGS PD EAL Technical Bases Document were excluded.

## **7.0 OCNGS to NEI 99-01 EAL Cross-Reference**

The table below facilitates association and location of the OCNGS EAL with the corresponding NEI 99-01 IC/EAL. Further information regarding the development of the OCNGS EALs based on the NEI guidance can be found in the EAL Comparison Matrix.

<b>OCNGS Permanently Defueled IC/EALs</b>	<b>NEI 99-01, Rev. 6, Appendix C – Permanently Defueled Station ICs/EALs</b>
PD-RU1	PD-AU1
PD-RA1	PD-AA1
PD-RU2	PD-AU2
PD-RA2	PD-AA2
PD-HU1	PD-HU1
PD-HA1	PD-HA1
PD-HU2	PD-HU2
PD-HU3	PD-HU3
PD-HA3	PD-HA3
PD-SU1	PD-SU1
<b>OCNGS ISFSI ICs/EAL</b>	<b>NEI 99-01, Rev. 6, Section 8 – ISFSI ICs/ EALs</b>
E-HU1	E-HU1

## 8.0 Attachments

### 8.1 Attachment 1, EAL Matrices

- References to Operating Modes were removed from Table PD-1.
- The EALs were developed using Appendix C of NEI 99-01.

### 8.2 Attachment 2, EAL Bases

- Attachment 2 of the OCNGS EAL Technical Bases provides the Permanently Defueled IC/EALs and incorporates Appendix C of NEI 99-01.
- Reference to Section 3 of NEI 99-01 was excluded since the section was not included and references made to this section was removed.
- The table below provides a comparison of the OCNGS PD EALs against the corresponding information contained in NEI 99-01.
- Attachment 2 of the OCNGS EAL Technical Bases provides the ISFSI IC/EALs and incorporates Section 8 of NEI 99-01.
- Reference to Operating Mode was removed from Table E-1 because Operating Modes are not applicable in a permanently defueled facility.
- The table below provides a comparison of the OCNGS ISFSI EALs against the corresponding information contained in NEI 99-01.

**NEI 99-01 Sections Not Included**

The following sections of NEI 99-01 were not included and references made to these sections were also removed:

- Section 3, "Design of the NEI 99-01 Emergency Classification Scheme"
- Section 4, "Site-Specific Scheme Development Guidance"

The following sections of NEI 99-01 were removed from the OCNGS PD EAL matrix as these do not apply to a permanently defueled facility:

- Section 6, Abnormal Rad Levels/Radiological Effluent ICs/EALs,
- Section 7, Cold Shutdown/Refueling System Malfunction ICs/EALs,
- Section 9, Fission Product Barrier ICs/EALs,
- Section 10, Hazards and Other Conditions Affecting Plant Safety ICs/EALs, and
- Section 11, System Malfunction ICs/EALs.

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>PD-AU1</b>  <b>ECL:</b> Notification of Unusual Event</p> <p><b>Initiating Condition:</b> Release of gaseous or liquid radioactivity greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b> (1 or 2)</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• The Emergency Director should declare the Unusual Event promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded.</li> <li>• If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.</li> <li>• If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.</li> </ul>	<p><b>PD-RU1</b>  <b>Category:</b> R- Abnormal RadLevels/ Radiological Effluent</p> <p><b>PD-RU1</b> Release of gaseous or liquid radioactivity greater than 2 times the radiological effluent Offsite Dose Calculation Manual (ODCM) limits for 60 minutes or longer.</p> <p><b><u>Emergency Action Level (EAL):</u></b></p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• The Emergency Director should declare the UNUSUAL EVENT promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded.</li> <li>• If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.</li> <li>• Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.</li> </ul>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• "AU1" is replaced with "RU1" to better signify a radiological event and to maintain continuity with the previous OCNCS emergency action level scheme.</li> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Inserted Offsite Dose Calculation Manual (ODCM) as the site-specific effluent release controlling document.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Provided additional provision for classification based on effluent monitor readings. Changed format of EALs to separate EALs 1 and 2 into distinct EALs.</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>									
<p>(1) Reading on <b>ANY</b> effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.</p> <p>(2) Sample analysis for a gaseous or liquid release indicates a concentration or release rate greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer.</p>	<p>1. Readings on <b>ANY</b> Table R1 Effluent Monitor &gt; <b>Table R1 value</b> for <b>≥ 60 minutes</b>:</p> <table border="1" data-bbox="810 399 1310 724"> <thead> <tr> <th colspan="3">Table R1 Effluent Monitor Thresholds</th> </tr> <tr> <th colspan="2">Release Path</th> <th>UNUSUAL EVENT</th> </tr> </thead> <tbody> <tr> <td>Main Stack RAGEMS</td> <td>HRM = High Range Monitor</td> <td>3.6 µCi/cc HRM</td> </tr> </tbody> </table> <p><b>OR</b></p> <p>2. Sample analyses for gaseous or liquid releases indicates a concentration or release rates &gt; <b>2 times ODCM Limit</b> with a release duration of <b>≥ 60 minutes</b>.</p>	Table R1 Effluent Monitor Thresholds			Release Path		UNUSUAL EVENT	Main Stack RAGEMS	HRM = High Range Monitor	3.6 µCi/cc HRM	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>Removed "radiation" from monitor notation.</li> <li>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.</li> <li>Included Table R1 to provide site-specific effluent monitor description and threshold value.</li> <li>Added "OR" to reflect the EAL conditions that represent entry into the classification.</li> <li>Provided additional provisions for using sample analysis results of a gaseous or liquid release as an action level.</li> </ul>
Table R1 Effluent Monitor Thresholds											
Release Path		UNUSUAL EVENT									
Main Stack RAGEMS	HRM = High Range Monitor	3.6 µCi/cc HRM									
<p><b>Basis:</b></p> <p>This IC addresses a potential 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 un-monitored, including those for which a radioactivity discharge permit is normally prepared.</p>	<p><b>OCNCS Basis:</b></p> <p>This IC addresses a potential decrease in the level of safety of the facility 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 un-monitored, including those for which a radioactivity discharge permit is normally prepared.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>Added OCNCS-specific basis information.</li> <li>Replaced "plant" with "facility."</li> </ul>									

<p><b>NEI99-01 Rev6 Appendix C–Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p>Nuclear power plants incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.</p> <p>Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.</p> <p>Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.</p> <p>Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.</p> <p>EAL #1 - This EAL addresses radioactivity releases that cause effluent radiation monitor readings to exceed 2 times the limit established by a radioactivity discharge permit. This EAL will typically be associated with planned batch releases from non-continuous release pathways (e.g., radwaste, waste gas).</p>	<p>OCNGS incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.</p> <p>Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of facility conditions alone. The inclusion of both facility condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.</p> <p>Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.</p> <p>The radwaste liquid discharge system is currently closed off with a facility modification installed blank flange. To perform a discharge would require a facility modification to remove the flange. Since the liquid radwaste system is not operable, no EAL threshold has been developed for this release point.</p> <p>EAL #1 Basis</p> <p>This EAL addresses limits to radioactive releases that could occur through normal reactor building ventilation effluent pathway.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>Removed paragraph describing "Classification based on effluent monitoring readings..." since it is stated in the EAL Notes.</li> <li>Split the explanation of the two separate EAL criteria thus providing additional provisions for using sample analysis results of a gaseous or liquid release as an action level.</li> <li>Added OCNCS specific information to explain radwaste liquid monitoring system.</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNGS</b></p>	<p><b>Comparison</b></p>
<p>EAL #2 - This EAL addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys, particularly on unmonitored pathways (e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.).</p> <p>Escalation of the emergency classification level would be via IC PD-AA1.</p>	<p>EAL #2 Basis</p> <p>This EAL addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys, particularly on unmonitored pathways (e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.).</p> <p>Escalation of the emergency classification level would be via IC PD-RA1.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Replaced "AA1" with "RA1" to better describe escalation pathway.</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>PD-AA1</b>  <b>ECL:</b> Alert</p> <p><b>Initiating Condition:</b> Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p>Example Emergency Action Levels: (1 or 2 or 3 or 4)</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• The Emergency Director should declare the Alert promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</li> <li>• If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.</li> <li>• If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.</li> <li>• The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.</li> </ul>	<p><b>PD-RA1</b></p> <p><b>Category:</b> R - Abnormal Rad Levels/ Radiological Effluents</p> <p><b>PD-RA1:</b> Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE.</p> <p><b><u>Emergency Action Level (EAL):</u></b></p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• The Emergency Director should declare the Alert promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</li> <li>• If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.</li> <li>• Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.</li> <li>• The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.</li> </ul>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• "AA1" is replaced with "RA1" to better signify a radiological event and to maintain continuity with the previous OCNCS action level scheme.</li> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Modified EAL numbering and separated EALs 1, 2, 3 and 4 into EAL flowchart format.</li> <li>• Provided additional provision for classification based on effluent monitor readings.</li> </ul>

NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed EAL Matrix for OCNGS	Comparison									
<p>(1) Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site-specific monitor list and threshold values)</p> <p>(2) Dose assessment using actual meteorology indicates doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point).</p> <p>(3) Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point) for one hour of exposure.</p>	<p>1. Readings on <b>ANY</b> Table R1 Effluent Monitor <b>&gt; Table R1 value</b> for <b>≥ 15 minutes</b>.</p> <table border="1" data-bbox="808 378 1308 670"> <thead> <tr> <th colspan="3">Table R1 Effluent Monitor Thresholds</th> </tr> <tr> <th colspan="2">Release Path</th> <th>ALERT</th> </tr> </thead> <tbody> <tr> <td><b>Main Stack RAGEMS</b></td> <td>HRM = High Range Monitor</td> <td>110 µCi/cc HRM</td> </tr> </tbody> </table> <p><b>OR</b></p> <p>2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of <b>EITHER</b>:</p> <p>a. <b>&gt; 10 mRem TEDE</b></p> <p><b>OR</b></p> <p>b. <b>&gt; 50 mRem CDE Thyroid</b></p> <p><b>OR</b></p> <p>3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than <b>EITHER</b> of the following at or beyond the site boundary</p> <p>a. <b>&gt; 10 mRem TEDE for 60 minutes</b> of exposure</p> <p><b>OR</b></p> <p>b. <b>&gt; 50 mRem CDE Thyroid for 60 minutes</b> of exposure</p>	Table R1 Effluent Monitor Thresholds			Release Path		ALERT	<b>Main Stack RAGEMS</b>	HRM = High Range Monitor	110 µCi/cc HRM	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Included Table R1 to provide site-specific effluent monitor description and threshold value.</li> <li>• Calculation EP-EAL-0610 was developed to determine the Main Stack Monitor threshold values.</li> <li>• Added "site boundary" as the site-specific dose receptor point.</li> <li>• Added "OR" to reflect the EAL conditions that represent entry into the classification.</li> </ul>
Table R1 Effluent Monitor Thresholds											
Release Path		ALERT									
<b>Main Stack RAGEMS</b>	HRM = High Range Monitor	110 µCi/cc HRM									

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p>(4) Field survey results indicate EITHER of the following at or beyond (site-specific dose receptor point):</p> <ul style="list-style-type: none"> <li>• Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer.</li> <li>• Analyses of field survey samples indicate thyroid CDE greater than 50 mrem for one hour of inhalation.</li> </ul>	<p><b>OR</b></p> <p>4. Field survey results at or beyond the site boundary indicate <b>EITHER</b>:</p> <p>a. Gamma (closed window) dose rates &gt; 10 mR/hr are expected to continue for ≥ 60 minutes.</p> <p><b>OR</b></p> <p>b. Analyses of field survey samples indicate &gt; 50 mRem CDE Thyroid for 60 minutes of inhalation.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p>
<p><b>Basis:</b></p> <p>This IC addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored 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).</p> <p>Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.</p>	<p><b>OCNCS Basis:</b></p> <p>This IC addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the facility as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).</p> <p>Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of facility conditions alone. The inclusion of both facility condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Replaced "plant" with "facility."</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNGS</b></p>	<p><b>Comparison</b></p>
<p><b>Basis (cont)</b></p> <p>The TEDE dose is set at 1% of the EPA PAG of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.</p> <p>Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.</p>	<p><b>OCNGS Basis (cont)</b></p> <p>The TEDE dose is set at 1% of the EPA PAG of 1000 mRem while the 50 mRem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.</p> <p>The radwaste liquid discharge system is currently closed off with a facility modification installed blank flange. To perform a discharge would require a facility modification to remove the flange. Since the liquid radwaste system is not operable, no EAL threshold has been developed for this release point.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Removed paragraph describing "Classification based on effluent monitoring readings..." since it is stated in the EAL Notes.</li> <li>• Provided explanation of radwaste liquid monitoring system.</li> <li>• Replaced "plant" with "facility."</li> </ul>

<p><b>NEI99-01 REV6 Appendix C-Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>PD-AU2</b>  <b>ECL:</b> Notification of Unusual Event</p> <p><b>Initiating Condition:</b> UNPLANNED rise in plant radiation levels.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b> (1 or 2)                      (1) a. UNPLANNED water level drop in the spent fuel pool as indicated by ANY of the following:                      (site-specific level indications).</p> <p><b>AND</b>                      b. UNPLANNED rise in area radiation levels as indicated by <b>ANY</b> of the following radiation monitors.                      (site-specific list of area radiation monitors).                      (2) Area radiation monitor reading or survey result indicates an UNPLANNED rise of 25 mR/hr over NORMAL LEVELS.</p>	<p><b>PD-RU2</b>  <b>Category:</b> R-Abnormal Rad Levels/ Radiological Effluents</p> <p><b>PD-RU2</b> UNPLANNED rise in facility radiation levels.</p> <p><b>Emergency Action Level (EAL):</b></p> <p>1. a. UNPLANNED water level drop in the Spent Fuel Pool as indicated by <b>ANY</b> of the following:</p> <ul style="list-style-type: none"> <li>• Spent Fuel Pool water level &lt; <b>117' 8"</b> (Fuel Pool Level Lo)</li> <li>• Indication or report of a drop in water level.</li> </ul> <p><b>AND</b>                      b. UNPLANNED Area Radiation Monitor reading rise on <b>ANY</b> 119' elevation radiation monitor.</p> <p><b>OR</b>                      2. Area radiation monitor reading or survey result indicates an UNPLANNED rise of <b>25 mR/hr</b> over NORMAL LEVELS.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• "AU2" is replaced with "RU2" to better signify a radiological event and to maintain continuity with the previous OCNCS action level scheme.</li> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Replaced "plant" with "facility."</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Modified EAL numbering and separated EALs 1 and 2 into EAL flowchart format.</li> <li>• Added "OR" to reflect the EAL conditions that represent entry into the classification.</li> <li>• Provided site-specific level indication that corresponds to SFP low level alarm.</li> <li>• Provided Area Radiation Monitoring for specific location.</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>Basis:</b></p> <p>This IC addresses elevated plant radiation levels caused by a decrease in water level above irradiated (spent) fuel or other UNPLANNED events. The increased radiation levels are indicative of a minor loss in the ability to control radiation levels within the plant or radioactive materials. Either condition is a potential degradation in the level of safety of the plant.</p> <p>A water level decrease will be 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). 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.</p> <p>The effects of planned evolutions should be considered. Note that EAL #1 is applicable only in cases where the elevated reading is due to an UNPLANNED water level drop. EAL #2 excludes radiation level increases that result from planned activities such as use of radiographic sources and movement of radioactive waste materials.</p> <p>Escalation of the emergency classification level would be via IC PD-AA1 or PD-AA2.</p>	<p><b>OCNCS Basis:</b></p> <p>This IC addresses a loss in water level above irradiated fuel sufficient to cause elevated radiation levels. This condition could be a precursor to a more serious event and is also indicative of a minor loss in the ability to control radiation levels within the facility. It is therefore a potential degradation in the level of safety of the facility.</p> <p>A water level loss will be primarily determined by indications from available level instrumentation. Other sources of level indications may include reports from facility personnel (e.g., from a refueling crew) or video camera observations (if available) or from any other temporarily installed monitoring instrumentation. A significant drop in the water level may also cause a rise in the radiation levels of adjacent areas that can be detected by monitors in those locations.</p> <p>The effects of planned evolutions should be considered. Note that EAL #1 is applicable only in cases where the elevated reading is due to an UNPLANNED water level drop. EAL #2 excludes radiation level increases that result from planned activities such as use of radiographic sources and movement of radioactive waste materials.</p> <p>Spent Fuel Pool (SFP) water level setpoint is less than 117' 8" (mean sea level), which corresponds to the SFP low level alarm. This indication is readily available to the control room operators and indicated on the plant computer system. The level corresponds to 21' 6 7/8" above the top of fuel assemblies. Digital level indication is also available to the hundredth position and the instrument is accurate to ± 0.25'.</p> <p>Escalation of the emergency classification level would be via IC PD-RA1 OR PD-RA2.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Wording in the OCNCS is modified to align with the previous wording in the OCNCS basis for EAL RU2, which is slightly different than the wording in NEI 99-01.</li> <li>• Replaced "plant" with "facility."</li> <li>• Replaced "AA1" and "AA2" with "RA1" and "RA2," respectively, to better describe escalation pathway.</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>PD-AA2</b>  <b>ECL:</b> Alert</p> <p><b>Initiating Condition:</b> UNPLANNED rise in plant radiation levels that impedes plant access required to maintain spent fuel integrity.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b> (1 or 2)</p> <p>(1) UNPLANNED dose rate greater than 15 mR/hr in <b>ANY</b> of the following areas requiring continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:                      (site-specific area list)</p> <p>(2) UNPLANNED Area Radiation Monitor readings or survey results indicate a rise by 100 mR/hr over NORMAL LEVELS that impedes access to <b>ANY</b> of the following areas needed to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity.                      (site-specific area list)</p>	<p><b>PD-RA2</b>  <b>Category:</b> R -Abnormal Rad Levels/ Radiological Effluents</p> <p><b>PD-RA2</b> UNPLANNED rise in facility radiation levels that impedes access required to maintain spent fuel integrity.</p> <p><b>Emergency Action Level (EAL):</b></p> <p>1. UNPLANNED dose rate &gt; 15 mR/hr in <b>ANY</b> of the following areas required for continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:</p> <ul style="list-style-type: none"> <li>• Control Room</li> <li>• Central Alarm Station</li> </ul> <p><b>OR</b></p> <p>2. UNPLANNED Area Radiation Monitor readings or survey results indicate a <b>rise</b> of &gt; 100 mR/hr over NORMAL LEVELS that impedes access to <b>ANY</b> of the following areas needed to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:</p> <ul style="list-style-type: none"> <li>• 119' Reactor Building elevation</li> <li>• SFP Cooling Pump /Heat Exchanger area</li> <li>• RBCCW Pump / Heat Exchanger area</li> </ul>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• "AA2" is replaced with "RA2" to better signify a radiological event and to maintain continuity with the previous OCNCS action level scheme.</li> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Replaced "plant" with "facility."</li> <li>• Changed format of EALs to separate EALs 1 and 2 into distinct EALs.</li> <li>• Added "OR" to reflect the EAL conditions that represent entry into the classification.</li> <li>• Added site-specific areas to EAL #1.</li> <li>• Added site-specific areas to EAL #2.</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>Basis:</b></p> <p>This IC addresses increased radiation levels that impede necessary access to areas containing equipment that must be operated manually or that requires local monitoring, in order to maintain systems needed to maintain spent fuel integrity.</p> <p>As used here, 'impede' includes hindering or interfering, provided that the interference or delay is sufficient to significantly threaten necessary plant access. It is this impaired access that results in the actual or potential substantial degradation of the level of safety of the plant.</p> <p>This IC does not apply to anticipated temporary increases due to planned events</p>	<p><b>OCNCS Basis:</b></p> <p>This IC addresses increased radiation levels that impede necessary access to areas containing equipment that must be operated manually or that requires 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 facility access. It is this impaired access that results in the actual or potential substantial degradation of the level of safety of the facility.</p> <p>This IC does not apply to anticipated temporary increases due to planned events.</p> <p>This IC addresses elevated radiation levels in certain facility rooms/areas sufficient to preclude or impede personnel from performing actions necessary to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity. As such, it represents an actual or potential substantial degradation of the level of safety of the facility.</p> <p>Assuming all facility equipment is operating as designed, normal operation is capable from the Control Room (CR). The areas listed in EAL-2 are facility areas that contain equipment which require a manual/local action necessary when moving fuel or manipulating SFP cooling equipment.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Replaced "plant" with "facility."</li> <li>• Maintained additional wording consistent with the previous wording in the basis for OCNCS EAL RA3, revised to reflect the defueled condition of the facility ("to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity").</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNGS</b></p>	<p><b>Comparison</b></p>
<p><b>PD-SU1</b>  <b>ECL:</b> Notification of Unusual Event</p> <p><b>Initiating Condition:</b> UNPLANNED spent fuel pool temperature rise.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b>                      (1) UNPLANNED spent fuel pool temperature rise to greater than (site-specific ° F).</p> <p><b>Basis:</b>                      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 plant. If uncorrected, boiling in the pool will occur, and result in a loss of pool level and increased radiation levels.                      Escalation of the emergency classification level would be via IC PD-AA1 or PD-AA2.</p>	<p><b>PD-SU1</b>  <b>Category:</b> S –System Malfunction Spent Fuel Pool</p> <p><b>PD-SU1</b> UNPLANNED Spent Fuel Pool temperature rise.</p> <p><b>Emergency Action Level (EAL):</b>                      1. UNPLANNED Spent Fuel Pool temperature rise to &gt; 125°F.</p> <p><b>OCNGS Basis:</b>                      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 irradiate fuel is stored in the spent fuel pool, the pool water temperature shall be maintained below 125°F (Reference 2).                      Escalation of the emergency classification level would be via PD-RA1 or PD-RA2.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Added site-specific temperature for the Spent Fuel Pool.</li> <li>• Replaced "plant" with "facility."</li> <li>• Replaced "AA1" with "RA1" and replaced "AA2" with "RA2" to better signify a radiological event and to maintain continuity with the previous OCNGS action level scheme.</li> </ul>

NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed EAL Matrix for OCNCS	Comparison
<p><b>PD-HU1</b></p> <p><b>ECL:</b> Notification of Unusual Event</p> <p><b>Initiating Condition:</b> Confirmed SECURITY CONDITION or threat.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b> (1 or 2 or 3)</p> <p>(1) A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the (site-specific security shift supervision).</p> <p>(2) Notification of a credible security threat directed at the site.</p> <p>(3) A validated notification from the NRC providing information of an aircraft threat.</p> <p><b>Basis:</b></p> <p>This IC addresses events that pose a threat to plant personnel or the equipment necessary to maintain cooling of spent fuel, and thus represent a potential degradation in the level of plant safety. Security events which do not meet one of these EALs are adequately addressed by the requirements of 10 CFR § 73.71 or 10 CFR § 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under IC PD-HA1.</p> <p>Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event. Classification of these events will initiate appropriate threat-related notifications to plant personnel and OROs.</p>	<p><b>PD-HU1</b></p> <p><b>Category:</b> H–Hazards and Other Conditions Affecting Facility Safety</p> <p><b>PD-HU1</b> Confirmed SECURITY CONDITION or threat.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities.</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>A validated notification from the NRC providing information of an aircraft threat.</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>Notification by the Security Force of a SECURITY CONDITION that does <b>not</b> involve a HOSTILE ACTION.</li> </ol> <p><b>OCNCS Basis:</b></p> <p>This IC addresses events that pose a threat to facility personnel or spent fuel cooling system equipment, and thus represent a potential degradation in the level of facility safety. Security events which do not meet one of these EALs are adequately addressed by the requirements of 10 CFR § 73.71 or 10 CFR § 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under ICs PD-HA1.</p> <p>Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event. Classification of these events will initiate appropriate threat-related notifications to facility personnel and OROs.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>Removed Emergency Classification Level ("ECL") information.</li> <li>Added Recognition Category ("Category").</li> <li>Changed "Initiating Condition" to IC/EAL identifier.</li> <li>Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>Changed format and order of EALs to separate EALs 1, 2, and 3 into distinct EAL ICs.</li> <li>Added "OR" to reflect the EAL conditions that represent entry into the classification.</li> <li>Added security procedure to aide determining the notification of a credible threat.</li> <li>Security Force is provided as the site-specific security shift supervision.</li> <li>Replaced "plant" with "facility."</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNGS</b></p>	<p><b>Comparison</b></p>
<p><b>Basis (cont):</b></p> <p>Security plans and terminology are based on the guidance provided by NEI 03-12, Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program].</p> <p>EAL #1 references (site-specific security shift supervision) because these are the individuals trained to confirm that a security event is occurring or has occurred. Training on security event confirmation and classification is controlled due to the nature of Safeguards and 10 CFR § 2.39 information.</p> <p>EAL #2 addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with (site-specific procedure).</p> <p>EAL #3 addresses the threat from the impact of an aircraft on the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may also be provided by NORAD through the NRC. Validation of the threat is performed in accordance with (site-specific procedure).</p> <p>Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate Security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.</p> <p>Escalation of the emergency classification level would be via IC PD-HA1.</p>	<p><b>OCNGS Basis (cont):</b></p> <p>Security plans and terminology are based on the guidance provided by NEI 03-12, Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program].</p> <p>EAL #1 Basis</p> <p>Addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with SY-AA-101-132.</p> <p>EAL #2 Basis</p> <p>Addresses the threat from the impact of an aircraft on the facility. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may also be provided by NORAD through the NRC. Validation of the threat is performed in accordance with ABN-41, Security Event.</p> <p>EAL #3 Basis</p> <p>References Security Force because these are the individuals trained to confirm that a security event is occurring or has occurred. Training on security event confirmation and classification is controlled due to the nature of Safeguards and 10 CFR § 2.39 information.</p> <p>Escalation of the emergency classification level would be via IC PD-HA1.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Paragraph regarding Security-sensitive information was not included based on it being more relevant for EAL Developers (same paragraph is in the Developer Notes) than end-users.</li> <li>• Replaced "plant" with "facility."</li> </ul>

NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed EAL Matrix for OCNCS	Comparison
<p><b>PD-HA1</b>  <b>ECL:</b> Alert</p> <p><b>Initiating Condition:</b> HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b> (1 or 2)</p> <p>(1) A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the (site-specific security shift supervision).</p> <p>(2) A validated notification from NRC of an aircraft attack threat within 30 minutes of the site.</p> <p><b>Basis:</b></p> <p>This IC 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.</p> <p>Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event.</p> <p>Security plans and terminology are based on the guidance provided by NEI 03-12, <i>Template for the Security Plan, Training and Qualification Plan</i>,</p>	<p><b>PD-HA1</b></p> <p><b>Category:</b> H– Hazards and Other Conditions Affecting Facility Safety</p> <p><b>PD-HA1</b> HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.</p> <p><b>Emergency Action Level (EAL):</b></p> <ol style="list-style-type: none"> <li>1. A validated notification from NRC of an aircraft attack threat &lt; <b>30 minutes</b> from the site.</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA.</li> </ol> <p><b>OCNCS Basis:</b></p> <p>This IC addresses the notification of an aircraft attack threat or an occurrence of a HOSTILE ACTION within the OWNER CONTROLLED AREA. 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 facility and staff for a potential aircraft impact.</p> <p>Timely and accurate communications between Security Shift Supervision and the Control Room is essential for proper classification of a security-related event.</p> <p>Security plans and terminology are based on the guidance provided by NEI 03-12, <i>Template for the Security Plan, Training and Qualification Plan</i>,</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Changed format and order of EALs to separate EALs 1 and 2 into distinct EALs.</li> <li>• Added "OR" to reflect the EAL conditions that represent entry into the classification.</li> <li>• Security Force is provided as the site-specific security shift supervision.</li> <li>• Replaced "plant" with "facility."</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>Basis (cont):</b>  <i>Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program].</i>                      As time and conditions allow, these events require a heightened state of readiness by the plant staff and implementation of onsite protective measures (e.g., evacuation, dispersal or sheltering). The Alert declaration will also heighten the awareness of Offsite Response Organizations, allowing them to be better prepared should it be necessary to consider further actions.                      This IC does not apply to incidents that are accidental events, acts of civil disobedience, or otherwise are not a HOSTILE ACTION perpetrated by a HOSTILE FORCE. Examples include the crash of a small aircraft, shots from hunters, physical disputes between employees, etc. Reporting of these types of events is adequately addressed by other EALs, or the requirements of 10 CFR § 73.71 or 10 CFR § 50.72.                      EAL #1 is applicable for any HOSTILE ACTION occurring, or that has occurred, in the OWNER CONTROLLED AREA. This includes any action directed against an ISFSI that is located within the OWNER CONTROLLED AREA.                      This EAL is met when the threat-related information has been validated in accordance with (site-specific procedure).                      The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may be provided by NORAD through the NRC.</p>	<p><b>OCNCS Basis (cont):</b>                      Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program].                      As time and conditions allow, these events require a heightened state of readiness by the facility staff and implementation of onsite protective measures (e.g., evacuation, dispersal or sheltering). The Alert declaration will also heighten the awareness of Offsite Response Organizations (ORO), allowing them to be better prepared should it be necessary to consider further actions.                      This IC does not apply to incidents that are accidental events, acts of civil disobedience, or otherwise are not a HOSTILE ACTION perpetrated by a HOSTILE FORCE. Examples include the crash of a small aircraft, shots from hunters, physical disputes between employees, etc. Reporting of these types of events is adequately addressed by other EALs, or the requirements of 10 CFR § 73.71 or 10 CFR § 50.72.                      EAL #1 Basis                      The EAL addresses the threat from the impact of an aircraft on the facility, and the anticipated arrival time is within 30 minutes. The intent of this EAL is to ensure that threat-related notifications are made in a timely manner so that facility personnel and OROs are in a heightened state of readiness. This EAL is met when the threat-related information has been validated in accordance with ABN-41, Security Event.                      The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an aircraft. The status and size of the plane may be provided by NORAD through the NRC.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Replaced "plant" with "facility."</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>Basis (cont):</b></p> <p>In some cases, it may not be readily apparent if an aircraft impact within the OWNER CONTROLLED AREA was intentional (i.e., a HOSTILE ACTION). It is expected, although not certain, that notification by an appropriate Federal agency to the site would clarify this point. In this case, the appropriate federal agency is intended to be NORAD, FBI, FAA or NRC. The emergency declaration, including one based on other ICs/EALs, should not be unduly delayed while awaiting notification by a Federal agency.</p> <p>Emergency plans and implementing procedures are public documents; therefore, EALs should not incorporate Security-sensitive information. This includes information that may be advantageous to a potential adversary, such as the particulars concerning a specific threat or threat location. Security-sensitive information should be contained in non-public documents such as the Security Plan.</p> <p>EAL #2 addresses the threat from the impact of an aircraft on the plant, and the anticipated arrival time is within 30 minutes. The intent of this EAL is to ensure that threat-related notifications are made in a timely manner so that plant personnel and OROs are in a heightened state of readiness.</p>	<p><b>OCNCS Basis (cont):</b></p> <p>In some cases, it may not be readily apparent if an aircraft impact within the OWNER CONTROLLED AREA was intentional (i.e., a HOSTILE ACTION). It is expected, although not certain, that notification by an appropriate Federal agency to the site would clarify this point. In this case, the appropriate federal agency is intended to be NORAD, FBI, FAA or NRC. The emergency declaration, including one based on other ICs/EALs, should not be unduly delayed while awaiting notification by a Federal agency.</p> <p>EAL #2 Basis</p> <p>This EAL is applicable for any HOSTILE ACTION occurring, or that has occurred, in the OWNER CONTROLLED AREA. This includes any action directed against an ISFSI that is located outside the facility PROTECTED AREA.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Paragraph regarding Security-sensitive information was not included based on it being more relevant for EAL Developers (same paragraph is in the Developer Notes) than end-users.</li> <li>• Replaced "plant" with "facility."</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>PD-HU2</b>  <b>ECL:</b> Notification of Unusual Event</p> <p><b>Initiating Condition:</b> Hazardous event affecting SAFETY SYSTEM equipment necessary for spent fuel cooling.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b></p> <p>(1) a. The occurrence of <b>ANY</b> of the following hazardous events:</p> <ul style="list-style-type: none"> <li>• Seismic event (earthquake)</li> <li>• Internal or external flooding event</li> <li>• High winds or tornado strike</li> <li>• FIRE</li> <li>• EXPLOSION</li> <li>• (site-specific hazards)</li> <li>• Other events with similar hazard characteristics as determined by the Shift Manager</li> </ul> <p><b>AND</b></p> <p>b. The event has damaged at least one train of a SAFETY SYSTEM needed for spent fuel cooling.</p> <p><b>AND</b></p> <p>c. The damaged SAFETY SYSTEM train(s) cannot, or potentially cannot, perform its design function based on <b>EITHER</b>:</p> <ul style="list-style-type: none"> <li>• Indications of degraded performance</li> <li>• VISIBLE DAMAGE</li> </ul>	<p><b>PD-HU2</b>  <b>Category:</b> H–Hazards and Other Conditions Affecting Facility Safety</p> <p><b>PD-HU2</b> Hazardous Event affecting equipment necessary for spent fuel cooling.</p> <p><b>Emergency Action Level (EAL):</b></p> <p>1. a. The occurrence of <b>ANY</b> of the following hazardous events:</p> <ul style="list-style-type: none"> <li>• Seismic event (earthquake)</li> <li>• Internal or external flooding event</li> <li>• High winds or tornado strike</li> <li>• FIRE</li> <li>• EXPLOSION</li> <li>• Extreme High or Low Tides</li> <li>• Other events with similar hazard characteristics as determined by the Shift Manager</li> </ul> <p><b>AND</b></p> <p>b. The event has damaged at least one train of a system needed for Spent Fuel Cooling.</p> <p><b>AND</b></p> <p>c. The damaged train(s) cannot, or potentially cannot, perform its design function based on <b>EITHER</b>:</p> <ul style="list-style-type: none"> <li>• Indications of degraded performance</li> <li>• VISIBLE DAMAGE</li> </ul>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Removed "SAFETY SYSTEM" as the item is not applicable in the permanently shut down defueled condition. Revised to clarify that the EAL applies to systems, components or equipment that are needed for spent fuel cooling.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Changed numbering format of EALs.</li> <li>• Added extreme high or low tides as site-specific hazard.</li> <li>• Replaced "plant" with "facility."</li> <li>• Replaced "AA1" with "RA1" and replaced "AA2" with "RA2" to better signify a radiological event and to maintain continuity with the previous OCNCS action level scheme.</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>Basis:</b></p> <p>This IC addresses a hazardous event that causes damage to 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 of the plant.</p> <p>For EAL 1.c, the first bullet addresses damage to a SAFETY SYSTEM train that is in service/operation since indications for it will be readily available.</p> <p>For EAL 1.c, the second bullet addresses damage to a SAFETY SYSTEM train that is not in service/operation or readily apparent through indications alone. Operators will make this determination based on the totality of available event and damage report information. This is intended to be a brief assessment not requiring lengthy analysis or quantification of the damage.</p> <p>Escalation of the emergency classification level could, depending upon the event, be based on any of the Alert ICs; PD-AA1, PD-AA2, PD-HA1 or PD-HA3.</p>	<p><b>OCNCS Basis:</b></p> <p>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.</p> <p>For the first bullet in EAL 1.c, indications of degraded performance apply to in service/operating systems or components that are needed for spent fuel cooling.</p> <p>For the second bullet in EAL 1.c, VISIBLE DAMAGE applies to equipment needed for spent fuel cooling that is not in service/operating or readily apparent through indications alone. Operators will make this determination based on the totality of available event and damage report information. This is intended to be a brief assessment not requiring lengthy analysis or quantification of the damage.</p> <p>Escalation of the emergency classification level could, depending upon the event, be based on any of the Alert ICs: PD-RA1, PD-RA2, PD-HA1 or PD-HA3.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Replaced "plant" with "facility."</li> <li>• Removed "SAFETY SYSTEM" as the item is not applicable in the permanently shut down defueled condition. Revised to clarify that the EAL applies to systems, components or equipment that are needed for spent fuel cooling.</li> </ul>

NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed EAL Matrix for OCNCS	Comparison
<p><b>PD-HU3</b>  <b>ECL:</b> Notification of Unusual Event</p> <p><b>Initiating Condition:</b> Other conditions exist which in the judgment of the Emergency Director warrant declaration of a (NO)UE.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b>                      (1) Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.</p> <p><b>Basis:</b>                      This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for a NOUE.</p>	<p><b>PD-HU3</b>  <b>Category:</b> H–Hazards and Other Conditions Affecting Facility Safety</p> <p><b>PD-HU3</b> Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT.</p> <p><b>Emergency Action Level (EAL):</b>                      1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the facility or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of equipment required for spent fuel cooling occurs.</p> <p><b>OCNCS Basis:</b>                      This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for an UNUSUAL EVENT.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Removed number from EAL.</li> <li>• Removed "SAFETY SYSTEM" as the item is not applicable in the permanently shut down defueled condition. Revised to clarify that the EAL applies to systems, components or equipment that are needed for spent fuel cooling.</li> <li>• Removed numbering from EAL since it's a single EAL.</li> <li>• Replaced "plant" with "facility."</li> <li>• Replace NOUE with "UNUSUAL EVENT."</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>PD-HA3</b>  <b>ECL:</b> Alert</p> <p><b>Initiating Condition:</b> Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert.</p> <p><b>Operating Mode Applicability:</b> Not Applicable</p> <p><b>Example Emergency Action Levels:</b>                      (1) Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.</p> <p><b>Basis:</b>                      This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for an Alert.</p>	<p><b>PD-HA3</b>  <b>Category:</b> H–Hazards and Other Conditions Affecting Facility Safety</p> <p><b>PD-HA3</b> Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT.</p> <p><b>Emergency Action Level (EAL):</b>                      1. Other conditions exist which, in the judgment of the Emergency Director, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the facility or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.</p> <p><b>OCNCS Basis:</b>                      This IC addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency classification level description for an ALERT.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added Recognition Category ("Category").</li> <li>• Changed Initiating Condition to IC/EAL identifier.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Removed number from EAL since it's a single EAL.</li> <li>• Replaced "plant" with "facility."</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>E-HU1</b>  <b>ECL:</b> Notification of Unusual Event  <b>Initiating Condition:</b> Damage to a loaded cask CONFINEMENT BOUNDARY.  <b>Operating Mode Applicability:</b> All  <b>Example Emergency Action Levels:</b>                      (1) Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than (2 times the site-specific cask specific technical specification allowable radiation level) on the surface of the spent fuel cask.</p>	<p><b>E-HU1</b>  <b>Category:</b> E – ISFSI Malfunction  <b>E-HU1</b> Damage to a loaded cask CONFINEMENT BOUNDARY.  <b>Emergency Action Level (EAL):</b>                      1. Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by a radiation reading:  <ul style="list-style-type: none"> <li>• &gt; 1400 mRem/hr (gamma + neutron) on the Horizontal Storage Module (HSM) front surface (applicable to type 1 61BTH DSC only)</li> </ul> <b>OR</b>  <ul style="list-style-type: none"> <li>• &gt; 800 mRem/hr (gamma + neutron) 3 feet from the HSM surface (applicable to 61BT DSC only)</li> </ul> <b>OR</b>  <ul style="list-style-type: none"> <li>• &gt; 200 mr/hr (gamma + neutron) outside the HSM door on centerline of DSC</li> </ul> <b>OR</b>  <ul style="list-style-type: none"> <li>• &gt; 40 mr/hr (gamma + neutron) end of shield wall exterior</li> </ul> </p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• Removed Emergency Classification Level ("ECL") information.</li> <li>• Added "Recognition Category" ("Category").</li> <li>• Changed "Initiating Condition" to IC/EAL identifier.</li> <li>• Removed "Operating Mode Applicability" information as it does not apply in a permanently defueled condition.</li> <li>• Removed "Example" from Emergency Action Levels since they are no longer examples.</li> <li>• Removed reference to "on-contact." Since one of the threshold Technical Specification reference was taken at 3ft. away from the HSM surface.</li> <li>• Removed "on the surface of the spent fuel cask."</li> <li>• Included site-specific values for Horizontal Storage Modules from ISFSI Technical Specifications.</li> </ul>

<p><b>NEI99-01 Rev6 Appendix C – Permanently Defueled Station ICs/EALs</b></p>	<p><b>Proposed EAL Matrix for OCNCS</b></p>	<p><b>Comparison</b></p>
<p><b>Basis:</b></p> <p>This IC 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.</p> <p>The existence of "damage" is determined by radiological survey. The technical specification multiple of "2 times", which is also used in Recognition Category A IC AU1, is used here to distinguish between non-emergency and emergency conditions. The emphasis for this classification is the degradation in the level of safety of the spent fuel cask and not the magnitude of the associated dose or dose rate. It is recognized that in the case of extreme damage to a loaded cask, the fact that the "on-contact" dose rate limit is exceeded may be determined based on measurement of a dose rate at some distance from the cask.</p> <p>Security-related events for ISFSIs are covered under ICs HU1 and HA1.</p>	<p><b>OCNCS Basis:</b></p> <p>This IC 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 word cask, as used in this EAL, refers to the storage container in use at the site for dry storage of irradiated fuel. The issues of concern are the creation of a potential or actual release path to the environment, degradation of any fuel assemblies due to environmental factors, and configuration changes which could cause challenges in removing the cask or fuel from storage.</p> <p>The existence of "damage" is determined by radiological survey. The cask technical specification multiple of "2 times", which is also used in Recognition Category R IC PD-RU1, is used here to distinguish between non-emergency and emergency conditions. The emphasis for this classification is the degradation in the level of safety of the spent fuel cask and not the magnitude of the associated dose or dose rate. It is recognized that in the case of extreme damage to a loaded cask, the fact that the "on-contact" dose rate limit is exceeded may be determined based on measurement of a dose rate at some distance from the cask.</p> <p>Security-related events for ISFSIs are covered under ICs PD-HU1 and PD-HA1.</p>	<p><input type="checkbox"/> No Change   <input checked="" type="checkbox"/> Difference   <input type="checkbox"/> Deviation</p> <ul style="list-style-type: none"> <li>• The sentence referring to the "word cask" is being maintained from the previous E-HU1 basis wording to provide clarification.</li> <li>• Added "PD" to references to HU1 and HA1 to reflect the appropriate references in the proposed EALs.</li> </ul>

**Attachment 5**

**OYSTER CREEK NUCLEAR GENERATING STATION**

**DOCKET NUMBERS 50-219 & 72-15**

**LICENSE NUMBER DPR-16**

**CORRESPONDENCE WITH THE STATE OF NEW JERSEY  
REGARDING THE PERMANENTLY DEFUELED EMERGENCY  
PLAN**



## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION  
RADIATION PROTECTION ELEMENT  
DIVISION OF ENERGY, SECURITY AND SUSTAINABILITY  
BUREAU OF NUCLEAR ENGINEERING

Mail Code 33-01  
P.O. Box 420  
Trenton, NJ 08625-0420  
TEL (609) 984-7701  
FAX (609) 984-7513

CHRIS CHRISTIE  
*Governor*

KIM GUADAGNO  
*Lt. Governor*

BOB MARTI  
*Commissioner*

August 28, 2017

Michael P. Gallagher  
Vice President, License Renewal & Decommissioning  
Exelon Generation Company, LLC  
200 Exelon Way  
Kenneth Square, PA 19348

Dear Mr. Gallagher:

On August 4, 2017, New Jersey's Department of Environmental Protection Bureau of Nuclear Engineering (BNE) received three draft documents for proposed changes to the Oyster Creek Emergency Plan for Permanently Defueled Condition.

1. Permanently Defueled Emergency Plan (EP-OC-1001, Revision 0)
2. Permanently Defueled Emergency Action Levels and Technical Basis (EP-OC-1001, Addendum 1, Revision 0)
3. Comparison Document for Permanently Defueled EALs based upon Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels", Revision 6

The BNE provided comments regarding the proposed changes contained in the above documents on August 21, 2017 and met with Exelon on August 25, 2017 to discuss these comments. The Bureau will review the final submittal after it is filed with the NRC and determine if further comments are warranted at that time.

The BNE appreciates the opportunity to comment on this important document. If you have any questions, please feel free to contact me at (609) 984-7701 or via email at [patrick.mulligan@dep.nj.gov](mailto:patrick.mulligan@dep.nj.gov)

Sincerely,



Patrick Mulligan, Manager  
Bureau of Nuclear Engineering

cc: Tim Moore, Oyster Creek Site Vice President  
Jeffrey Dostal, Oyster Creek Site Decommissioning Director  
Paul Orlando, Director, NJDEP