

Attachment 1

Letter Number 2.18.035

Description and Evaluation of the Proposed Changes

(20 pages follow)

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGES

SUBJECT: Revise the Pilgrim Emergency Plan and Emergency Action Level Scheme to Address the Permanently Defueled Condition

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1.0 SUMMARY DESCRIPTION

Pursuant to Title 10, Code of Federal Regulations (CFR) 50.90, Entergy Nuclear Operations, Inc. (ENO) requests U.S. Nuclear Regulatory Commission (NRC) review and approval of a revision to the Pilgrim Nuclear Power Station (PNPS) Emergency Plan.

The proposed changes would revise the PNPS 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 PNPS Permanently Defueled Emergency Plan (PDEP) and the Permanently Defueled 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, as exempted, for a permanently defueled reactor. ENO 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 July 3, 2018 (Reference 1). Reference 1 contains an analysis which shows that 10 months after shutdown, the spent fuel stored in the spent fuel pool (SFP) will have decayed to the extent that the exemptions requested in Reference 1, the PDEP, and the Permanently Defueled EAL scheme may be implemented at PNPS. The analysis demonstrates that 10 months after permanent cessation of power operations, there is sufficient time to mitigate events that could lead to a zirconium fire. Following the PNPS shutdown, which is expected to occur no later than June 1, 2019 (Reference 2), 10 months after shutdown would fall on April 1, 2020.

2.0 DETAILED DESCRIPTION

The proposed amendment would modify the PNPS license by revising the PNPS Emergency Plan and the associated EAL scheme to reflect the pending permanent cessation of power operations and permanent removal of fuel from the PNPS reactor, and the anticipated conditions following 10 months of decay of the spent fuel in the SFP. In the permanently defueled condition, the number and severity of potential radiological accidents is significantly less than when the facility is operating. Therefore, the offsite radiological consequences of accidents possible at PNPS in the permanently defueled condition will be substantially lower than during plant operation. No postulated accident or reasonably conceivable beyond design basis event will be expected to result in radioactive releases that exceed Environmental Protection Agency (EPA) Protective Action Guides (PAGs) beyond the site boundary. 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). Therefore, the proposed PDEP states that PNPS will maintain the ability to assess, classify, and declare an emergency within 30 minutes after the availability of indications that an EAL threshold has been reached. Emergency declaration is required to be made as soon as conditions warranting classification are recognizable, but within 30 minutes after the availability of indications that an EAL has been, or may be, exceeded. Notification of an emergency declaration will be made to State and County authorities within 60 minutes of an emergency declaration or change in classification. The proposed PDEP reduces the scope of onsite and offsite emergency planning activities commensurate with the spectrum of credible accidents that can occur in a permanently shut down and defueled condition.

The proposed PDEP meets the applicable standards of 10 CFR 50.47(b) and requirements of 10 CFR Part 50, Appendix E, as modified by the separately submitted request for exemptions (Reference 1).

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The current PNPS EAL scheme is based on the guidance presented in NEI 99-01, "Methodology for Development of Emergency Action Levels," Revision 5, (Reference 3) for an operating facility. ENO determined that a revision to implement the EAL scheme contained in Appendix C of NEI 99-01, Revision 6 (Reference 4), Recognition Category PD (Permanently Defueled), is appropriate to address the permanently shut down and defueled condition. This determination is supported by the analyses presented in Reference 1. NEI 99-01, Revision 6, was endorsed by the NRC in a letter dated March 28, 2013 (Reference 5).

2.1. Reason for the Proposed Changes

The proposed changes to the PNPS Emergency Plan and EAL scheme are necessary to reflect the pending permanent cessation of power operations, anticipated to occur no later than June 1, 2019 (Reference 2), and the permanent removal of fuel from the PNPS reactor. Based on analysis submitted with Reference 1, the radiological conditions following 10 months of decay of the spent fuel in the SFP support the proposed changes. Shortly after the reactor is permanently shut down, all fuel assemblies will be removed from the reactor vessel and placed in the SFP. Once certification of permanent removal of fuel from the reactor vessel is submitted to the NRC in accordance with 10 CFR 50.82(a)(1)(ii), and docketed, the 10 CFR Part 50 license will no longer authorize operation of the reactor or emplacement of fuel in the reactor vessel in accordance with 10 CFR 50.82(a)(2). The irradiated fuel will be stored in the SFP or in the Independent Spent Fuel Storage Installation (ISFSI) until it is removed by the U.S. Department of Energy (DOE).

The proposed revisions to the PNPS Emergency Plan and EAL scheme are commensurate with the reduction in radiological hazards associated with the permanently shut down and defueled condition and will allow PNPS to transition to an emergency plan and EAL scheme required for a permanently defueled facility. The proposed changes are necessary to properly reflect the conditions of the facility 10 months following permanent cessation of power operations while continuing to maintain the effectiveness of the PNPS emergency plan and preserve the PNPS Decommissioning Trust Fund.

2.2. Background

PNPS is located in the town of Plymouth, Plymouth County, in the Commonwealth of Massachusetts. It is situated on the western coast of Cape Cod Bay, on approximately 1600 acres of land, owned by Entergy Nuclear Generation Company. A detailed description of the plant is given in the PNPS Updated Final Safety Analysis Report (UFSAR). The ISFSI consists of HI-STORM vertical dry spent fuel storage casks on a concrete slab located within the protected area. A detailed description of the HI-STORM storage casks is given in the HI-STORM 100 Cask System FSAR.

Chapter 14 of the PNPS UFSAR describes the design-basis-accident (DBA) scenarios that are applicable to PNPS during power operations. The most severe postulated accidents for nuclear power plants involve damage to the nuclear reactor core and the release of large quantities of fission products. The UFSAR accident scenarios include a Control Rod Drop Accident (CRDA), a Loading Error Accident, a Loss-of-Coolant Accident (LOCA), a Fuel Handling Accident, a Radwaste System Accident, and a Main Steam Line Break Accident.

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, and 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

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or malfunction of the reactor, reactor cooling system, steam system, or turbine generator are no longer applicable.

When the reactor is permanently defueled, the SFP and its supporting systems will be modified and dedicated only to spent fuel storage. A SFP cooling and clean-up system is provided to remove decay heat from spent fuel stored in the SFP and to maintain a specified water temperature, purity, clarity, and level.

3.0 TECHNICAL EVALUATION

3.1 Accident Analysis Overview

10 CFR 50.82(a)(2) specifies that the 10 CFR Part 50 license no longer authorizes operation of the reactor or emplacement or retention of fuel in the reactor vessel after docketing the certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel in accordance with 10 CFR 50.82(a)(1). Following the termination of power operations at PNPS, 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 are no longer applicable.

A summary of the postulated radiological accidents analyzed for the permanently shut down and defueled condition is presented below. Current guidance provided in the EPA's, "Protective Action Guides and Planning Guidance for Radiological Incidents, EPA-400/R-17/001," dated January 2017 (Reference 6), Section 2.2.4, "PAGs and Nuclear Facilities Emergency Planning Zones (EPZ)," states that the EPZ is based on the maximum distance at which a PAG might be exceeded.

Section 5.0 of Interim Staff Guidance (ISG) – 02 (Reference 7) 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 a period of 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 from 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 zirconium cladding ignition.

PNPS also described the applicable analyses in Reference 1, where the applicable analyses were provided for NRC review. Specific analyses are summarized in the following sections.

3.1.1 Consequences of Design Basis Events

The current design basis Fuel Handling Accident (FHA) is a drop of a fuel assembly over the reactor cavity, the most limiting location for an FHA to occur at PNPS. After permanent shutdown and removal of fuel from the reactor, an FHA in the reactor cavity is no longer a credible accident. While spent fuel remains in the SFP, the postulated DBA that will remain applicable to PNPS that could contribute to dose upon implementation of the requested exemptions is the FHA in the reactor building, where the SFP is located. PNPS performed an analysis documenting that the current design basis FHA results are bounding. The DBA FHA analysis uses the accident source term guidelines outlined in NUREG-1465 (Reference 8), Regulatory Guide 1.183 (Reference 9), and Regulatory Guide 1.194 (Reference 10). The results of the analysis, detailed in UFSAR Table

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14-5.5, indicate that the EAB, Low Population Zone (LPZ), and Control Room doses are within their respective regulatory allowable limits for an FHA occurring in the reactor building. Additionally, the analysis concludes that the dose at the EAB 72 hours after shutdown is 0.91 rem Total Effective Dose Equivalent (TEDE), which is below the EPA PAG limit of 1 rem.

PNPS UFSAR Section 14.5 incorporated the GE Hitachi Nuclear Energy Report, "Fuel Handling Accident in the Spent Fuel Pool Generic Dose Assessment" (Reference 11) for the fuel handling accident involving an unchanneled fuel assembly in the SFP. The assessment concluded that for the consequences of the design basis FHA to remain bounding, an unchanneled fuel assembly must be allowed to decay for a minimum of 45 days from the time of reactor shutdown in which the assembly in question was part of the critical reactor core. The 45-day decay period ensures the radiological source term is sufficiently reduced so that the consequences of the design basis FHA remain bounding. The PNPS design basis FHA assumes the source term in an irradiated fuel assembly has been reduced by 24 hours (1 day) of decay since the time of reactor shutdown. To ensure the consequences of postulated drop of an unchanneled fuel assembly in the SFP are bounded by the PNPS design basis FHA, an additional 45 days of decay is required. Therefore, PNPS maintains a procedurally enforced administrative restriction prohibiting the handling of unchanneled assemblies unless they have decayed for a minimum of 46 days following reactor shutdown to ensure the consequences of the design basis FHA remains bounding for the drop of an unchanneled irradiated fuel assembly in the SFP.

Due to the amount of decay calculated (72 hours after reactor shutdown) and the procedurally enforced administrative restriction prohibiting the handling of unchanneled assemblies unless they have decayed for a minimum of 46 days following reactor shutdown, the results of this analysis may be applied after August 15, 2019, assuming a PNPS shut down by June 1, 2019 (Reference 2).

The analysis is also described in Reference 1.

3.1.2 Consequences of a Beyond Design Basis Event

With respect to beyond design basis events, ENO analyzed a partial drain down of the SFP water that would effectively impede any decay heat removal (adiabatic heatup). The analysis, provided to the NRC in Attachment 2 of Reference 1, compares the conditions for the hottest fuel assembly stored in the PNPS SFP to a criterion proposed in SECY-99-168 (Reference 12) applicable to offsite emergency response for a unit in the decommissioning process. This criterion considers the time for the hottest assembly to heat up from 30°C to 900°C adiabatically. Based on SECY-99-168, if the heat up time is greater than 10 hours from the time the spent fuel is uncovered, then offsite emergency preplanning involving the facility is not necessary.

Based on the limiting fuel assembly for decay heat and adiabatic heat up analysis, 10 months after permanent cessation of power operations is the time for the hottest fuel assembly to reach 900°C 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 13), 900°C is an acceptable temperature to use for assessing the 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.

Based on 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, or providing SFP spray. As a result, the likelihood that such a scenario would

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progress to a zirconium fire is deemed not credible and offsite emergency preplanning involving the facility is not necessary.

3.1.3 Consequences of Other Analyzed Events**3.1.3.1 Spent Fuel Pool Drain Down Event**

ENO 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 14) Supplement 1, Section 4.3.9, identifies that a SFP drain down event is beyond design basis. Although the analysis provided in Attachment 2 of Reference 1 demonstrated that a significant release of radioactive material from the spent fuel is not possible within 10 hours from the time the spent fuel is uncovered after approximately 10 months following permanent cessation of power operations, the potential exists for radiation exposure to an offsite individual if 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 pool and being scattered back to a receptor at the site boundary.

The offsite and Control Room radiological impact of a postulated complete loss of SFP water was assessed in a calculation provided to the NRC in Attachment 3 of Reference 1. The calculation documents 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 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 integrated 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 preplanning if efforts to reestablish shielding over the fuel are delayed.

Based on the data presented in Attachment 3 of Reference 1, it is reasonably estimated that 10 months following permanent cessation of power operations, the dose rate in the Control Room will be less than 0.02 mrem/hr. There are no acceptance criteria for dose rates in the Control Room in NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," (Reference 7). However, Appendix A to 10 CFR Part 50, "General Design Criteria (GDC)," Criterion 19 – Control Room states, in part:

"A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident."

The dose rate in the Control Room conservatively does not include shielding provided by walls and floors between the SFP and Control Room. This includes the 30-inch concrete slab ceiling of the Control Room, which would provide a considerable reduction in the dose rate.

3.1.3.2 Radioactive Waste Handling Accident

ENO evaluated the drop of a high integrity container (HIC) containing radioactive waste. The event considered a waste handling accident where a fully loaded HIC is dropped onto another fully

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loaded HIC and a fraction of the contents from both HICs are released. The spilled contents from the two HICs are then assumed to be engulfed in a fire resulting in a fraction of the contents being aerosolized. The accident evaluated the drop of a HIC containing a bounding activity of 945 curies of 22 various radionuclides representing a bounding isotopic mix. The calculation postulates that the accident occurs 100 meters (328 feet) from the EAB with subsequent container failure. The analysis assumes that 1% of the contents are released and 0.78% of the release becomes aerosolized and carried in the direction of the EAB. The resulting two-hour dose at the EAB is projected to be 27 millirem TEDE, which is below the EAB limit of 1 rem TEDE.

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

ENO also evaluated the Industry Decommissioning Commitments (IDCs) and Staff Decommissioning Assumptions (SDAs) contained in NUREG-1738 (Reference 13). 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. 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 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 15). The staff's analyses and conclusions apply to decommissioning facilities with SFPs that meet the design and operational characteristics assumed in the risk analysis.

The study found that the risk of a potential SFP accident 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).

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 1×10^{-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 2×10^{-7} per year)."

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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 (Reference 13). Tables 4 and 5 of Reference 1 identify how the PNPS SFP meets or compares with each of these IDCs and SDAs.

3.3 Consequences of a Beyond Design Basis Earthquake

NUREG-1738 (Reference 13) 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 substantial loss-of-water inventory from the SFP, as the only postulated scenario at a decommissioning plant that could result in 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 6) at the EAB.

The risk associated with zirconium cladding fire events decreases as the spent fuel ages. When the spent fuel ages, the decay time increases, the decay heat decreases, and the short-lived radionuclides decay away. As the decay time increases, the overall risk of 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 the research conducted for NUREG-1738 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," (September 2014) (Reference 16) suggests 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 due to dose, 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 16) 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 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."

NUREG-2161 also states:

"The study shows the likelihood of a radiological release from the spent fuel pool 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 individuals cancer fatality risk for a member of the public is several orders of magnitude lower than the Commission's Quantitative Health Objective of two in one million (2×10^{-6} /year). For such a radiological release, this study shows public and environmental effects are generally the same or smaller than earlier studies."

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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. PNPS is a General Electric Type 3 BWR with a Mark I containment licensed to generate 2028 MWt. Following permanent cessation of power operations and transfer of all fuel from the reactor vessel to the SFP, the SFP will contain a maximum of 2992 fuel assemblies.

ENO conducted a structural integrity seismic risk assessment of the PNPS SFP to assess seismically-induced structural failure and rapid loss of inventory. This assessment was performed using EPRI 3002009564, "Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation," (Reference 17) and is comprised of several complementary seismic evaluations of the PNPS SFP, which satisfy the expectations and intent of SDA-6 of NUREG-1738 (Reference 13).

Consistent with NUREG-1738, the seismic risk assessment considers catastrophic structural failure as governing the seismic risk. In addition to the primary seismic evaluation, a structural drawing review of the PNPS SFP was conducted. The review was based on the Enhanced Seismic Checklist in NUREG-1738 using the as-built drawings of the PNPS Reactor Building and the SFP. The structural drawing review did not identify any specific design or detail any vulnerability of the PNPS SFP that would challenge its seismic capacity. Additionally, a review of non-structural considerations related to the seismic capacity of the PNPS SFP was conducted. This review was based on the EPRI SFP Evaluation Guidance Report (Reference 17). Reference 17 provides screening-type evaluation criteria for demonstrating that a SFP will retain adequate water inventory for 72 hours following a seismic event, including non-structural considerations. The non-structural consideration review confirms that non-structural failure modes do not govern the overall seismic capacity of the SFP. This conclusion supports the use of structural integrity as the governing contributor for SFP seismic risk assessment. A seismic walkdown was also performed and confirmed the conclusions of the structural drawing review and of the non-structural considerations review, which also supports the SFP seismic risk assessment being governed by structural integrity of the SFP walls and slab (Reference 18).

The seismic evaluation demonstrates that the risk of a SFP seismically induced structural failure and rapid loss of inventory is 6.6×10^{-6} per year, which is less than the generic bounding estimates provided in NUREG-1738 ($<1 \times 10^{-5}$ per year including non-seismic events).

3.4 Permanently Defueled Emergency Plan

The PNPS PDEP is provided as Enclosure 1 of this submittal for NRC review and approval. The PDEP describes the station's plan for responding to emergencies that may arise at PNPS while in a permanently shut down and defueled configuration. The PDEP was developed considering the guidance contained within Attachment 1 of ISG-02 (Reference 7).

The analyses of the potential radiological impact of accidents while the facility is in a permanently shut down and defueled condition indicate that no postulated accident or reasonably conceivable beyond design basis event will be expected to result in radioactive releases that exceed EPA PAGs beyond the site boundary. 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). Therefore, the proposed PDEP will maintain the ability to assess, classify, and declare an emergency within 30 minutes after the availability of indications that an EAL threshold has been reached. Emergency declaration is required to be made as soon as conditions warranting classification are recognizable, but within 30 minutes after the availability of that an EAL has been, or may be, exceeded. Notification of an emergency declaration will be made to State and local authorities within 60 minutes of an emergency declaration or change in classification, as described further below.

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Based on the results of the accident analysis, the proposed changes to on-shift and Emergency Response Organization (ERO) staffing, emergency declaration and notification times and reduced scope of onsite and offsite emergency response plans can be implemented without undue risk to public health and safety, commensurate with the reduced offsite radiological consequences associated with the permanently defueled and decommissioning status of the facility.

3.4.1 On-Shift and Emergency Response Organization Staffing

The PNPS PDEP modifies the PNPS on-shift staff and ERO staffing proposed in PNPS Letter No. 2.18.004 dated January 12, 2018 (Reference 19). The proposed on-shift staffing consists of one (1) Control Room Supervisor, one (1) Non-Certified Operator (NCO), and one (1) Radiation Protection Technician. Security personnel are maintained in accordance with the Security Plan. The minimum staff required to conduct routine and immediate emergency mitigation is maintained on-shift 24-hours a day. The on-shift organization is described in Section 2.1 of Enclosure 1.

The on-shift staff provide the initial response to an event. The Control Room Supervisor is the on-shift individual who declares the initial emergency classification and assumes the role of Emergency Director. The Control Room Supervisor has the authority to immediately and unilaterally initiate any emergency actions. The PDEP also specifies the non-delegable and delegable responsibilities of the Emergency Director. Members of the on-shift organization are trained on their responsibilities and duties in the event of an emergency and can perform necessary response actions until the ERO arrives to augment on-shift staffing or the event is terminated. The on-shift staffing assignments include the roles and responsibilities for their emergency response functions. The relationship between normal and emergency response positions for the shift personnel is unchanged when an event occurs. The on-shift staff can perform all required response actions, including initiation of SFP mitigation measures, until the ERO arrives.

The PNPS ERO is activated at the Alert classification, and will augment the on-shift staff within approximately 2 hours of an Alert declaration. However, the ERO may be activated, in part or in whole, at any time at the discretion of the Control Room Supervisor/Emergency Director. The minimum augmented staff is a Radiation Protection (RP) Coordinator and a Technical Coordinator.

The staffing proposed in the PDEP is commensurate with the need to safely store spent fuel in the SFP and with the consequences of radiological events that will be possible at PNPS in the permanently shut down and defueled status of the facility.

The PDEP further provides that in the event of an emergency at PNPS requiring additional personnel and other support resources, the ERO can be augmented with manpower and equipment support from offsite organizations. 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 PNPS.

3.4.2 Emergency Communications

Section 6.0 of the PDEP, Emergency Communications, removes the specialized communication methods, such as Everbridge, DNN and BECONS currently utilized at PNPS. While PNPS must maintain the capability to notify offsite government agencies within a specified period, previous exemptions have allowed for extending the State and local government agencies' notification time

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up to 60 minutes based on the site-specific justification provided. As described in Reference 1, PNPS proposes to complete emergency notification to the Commonwealth of Massachusetts and the Town of Plymouth within 60 minutes after an emergency declaration or a change in classification. This timeframe is consistent with the 10 CFR 50.72(a)(3) notification to the NRC and is appropriate because in the permanently defueled condition, the rapidly developing scenarios associated with events initiated during reactor power operation are no longer credible and there is no need for State or local response organizations to implement any protective actions. Therefore, commercial communication methods (public/private telephone service and cellular phone service) are adequate primary and back-up methods of providing offsite notifications due to the extended time allowed for notifications.

As described in Enclosure 1, offsite notifications will be made via commercial telephone, with wireless communications serving as the backup means of communications.

3.4.3 Letters of Agreement

NSIR/DPR-ISG-02, Attachment 1, NUREG-0654 Criterion B.9 (Reference 7), states that reference to the arrangements and agreements with support agencies be appended to the plan. Rather than include the listing in an appendix to the proposed PDEP, details of offsite response organization responsibilities are described in Section 3.0 of the proposed PDEP. The Letters of Agreement between these organizations and PNPS are maintained on file in the Emergency Planning Department at PNPS.

Decommissioning-related emergency plan submittals for PNPS have been discussed with offsite response organizations since ENO submitted its notification that it would permanently cease power operations at PNPS, including meetings with the cognizant state and local response organizations. These meetings included a discussion of the proposed changes to the PNPS emergency plan described in this submittal. PNPS will continue to meet with representatives from the Commonwealth of Massachusetts, local emergency preparedness personnel, and Regional leadership from FEMA. These discussions have addressed changes to onsite and offsite emergency preparedness throughout the decommissioning process, including the proposed 30-minute declaration time and the 60-minute notification time. Emergency management officials have not objected to the proposed changes.

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 response agencies using established communications methods, including commercial telephones and the 9-1-1 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 7) 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 20) that remain applicable after the requested exemptions (Reference 1) are approved by the NRC.

3.5 Permanently Defueled Emergency Action Levels

The current PNPS EAL scheme was developed based on the guidance presented in NEI 99-01, Rev. 5 (Reference 3).

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGES

Enclosure 2 provides the proposed Permanently Defueled EAL Technical Bases Document, based on NEI 99-01, Revision 6, containing the site-specific technical bases for the proposed Permanently Defueled EAL scheme. The EALs that comprise the proposed Permanently Defueled EAL scheme are also presented in the matrix provided in Enclosure 3.

3.5.1 Differences and Deviations

Attachment 2 provides a cross-reference between each generic EAL contained in NEI 99-01, Revision 6 (Reference 4), 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) (Reference 21). As discussed in RIS 2003-18, Supplement 1, dated July 13, 2004, differences and deviations are defined as follows:

"A *difference* is an EAL change where the basis scheme guidance (NUREG, NUMARC, and 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, Revision 6 is included in Attachment 2. The differences do not alter the meaning or intent of the Initiating Condition or EAL.

"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.

3.5.2 Operating Modes and Applicability

The proposed Permanently Defueled EALs are only applicable in the permanently shut down and defueled condition, with all irradiated fuel permanently removed from the reactor vessel and following 10 months of decay of the spent fuel.

3.5.3 State and Local Government Review of Proposed Changes

Following NRC approval and prior to implementation of the proposed Permanently Defueled EAL scheme, ENO will review the new classification scheme with State and local emergency management officials in accordance with 10 CFR Part 50, Appendix E, Section IV.B.1. ENO proposes to continue to review EALs with the Commonwealth of Massachusetts and the Town of Plymouth on an annual basis. However, based upon the reduced scope of EALs for the permanently defueled facility, the scope of the annual review of EALs is expected to be limited (i.e., informal mailings, etc.).

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGES

3.6 Conclusion

ENO has demonstrated that no postulated accident or reasonably conceivable beyond design basis event will result in radiological releases requiring offsite protective actions, or there is sufficient time, resources, and personnel available to initiate mitigative actions that will prevent a release that exceeds EPA PAG doses offsite.

This proposed amendment would revise the PNPS Emergency Plan and the EAL scheme to reflect the permanently shut down and defueled condition following 10 months of decay of the spent fuel in the SFP. The proposed PDEP and Permanently Defueled 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.

4.0 REGULATORY EVALUATION**4.1 Applicable Regulatory Requirements and Guidance**

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. Entergy has filed exemptions to Planning Standard (4) as part of Reference 1. Planning Standard (4) requires that a licensee's emergency response plan contain the following (the requested exemptions in Reference 1 would delete the bracketed text):

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, specifies there be a means to determine the magnitude and to continually assess the impact of a release. Entergy has filed exemptions to portions of

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGES

Section IV.B.1 of Appendix E as part of Reference 1. Section IV.B.1 of Appendix E states, in part (the requested exemptions in Reference 1 would delete the bracketed text):

The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within [and outside] the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite [and offsite] monitoring. [By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.] The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and state and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.

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 each emergency plan to define the emergency classification levels that determine the extent of the participation of the emergency response organization. Entergy has filed exemptions to portions of Section IV.C.1 of Appendix E as part of Reference 1. Section IV.C.1 of Appendix E states, in part (the requested exemptions in Reference 1 would delete the bracketed text):

The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described. The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described. Emergency action levels (based not only on onsite [and offsite] radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, [such as the pressure in containment and the response of the Emergency Core Cooling System]) for notification of offsite agencies shall be described. The existence, but not the details, of a message authentication scheme shall be noted for such agencies. The emergency classes defined shall include: (1) Notification of unusual events, (2) alert, [(3) site area emergency, and (4) general emergency]. These classes are further discussed in NUREG-0654/FEMA-REP-1.

In November 2012, NEI published NEI 99-01, Revision 6 (Reference 4). The EAL scheme being requested herein are based on Revision 6 to NEI 99-01. The NRC endorsed NEI 99-01, Revision 6, by letter dated March 28, 2013 (Reference 5). Because 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, or there is sufficient time to initiate appropriate mitigating actions to protect the health and safety of the public (Reference 1), the Permanently Defueled EALs, detailed in NEI 99-01, Revision 6, will be adopted, with certain differences. 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.

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NSIR/DPR-ISG-02 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 PNPS Emergency Plan in order to establish a plan appropriate for a permanently defueled facility (a plan change that cannot be processed under 50.54(q)) and to implement a Permanently Defueled EAL scheme (a full scheme change for PNPS).

4.2 Precedent

The changes to the PNPS 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 approved by the NRC for 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) Omaha Public Power District (OPPD) for the Fort Calhoun Station (FCS) on December 12, 2017, as identified in Reference 22; 2) ENO for the Vermont Yankee Nuclear Power Station (VY) on December 11, 2015, as identified in Reference 23; 3) Southern California Edison Company for the San Onofre Nuclear Generating Station, Units 1, 2, and 3 on June 5, 2015 (References 24 and 25); 4) Duke Energy Florida, Inc. for the Crystal River Unit 3 Nuclear Generating Station on March 31, 2015 (Reference 26); and 5) Dominion Energy Kewaunee, Inc. for the Kewaunee Power Station on October 31, 2014 (Reference 27).

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 28 and 29.

Increasing the time to notify responsible state and local governmental agencies to 60 minutes from the time of emergency declaration was approved for the Haddam Neck Plant (Reference 30), the La Crosse Boiling Water Reactor (LACBWR) facility (Reference 31), Maine Yankee (Reference 32) and Yankee Rowe (Reference 33).

The requested amendment is also consistent with the phased approach to emergency planning provided in the ongoing decommissioning rulemaking, but ENO is seeking approval of the amendment prior to the expected final rule with the decommissioning changes.

4.3 No Significant Hazards Consideration Determination

Pursuant to 10 CFR 50.92, ENO, Inc. 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 Pilgrim Nuclear Power Station (PNPS) Emergency Plan and Emergency Action Level (EAL) scheme commensurate with the hazards associated with a permanently shut down and defueled facility.

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

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGES

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 PNPS Emergency Plan and EAL scheme do not impact the function of facility structures, systems, or components. The proposed changes do not affect accident initiators or precursors, nor do they alter design assumptions that could increase the probability or consequences of previously evaluated accidents. The proposed changes do not prevent the ability of the on-shift staff and emergency response organization 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 because 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 amendment 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 PNPS Emergency Plan and EAL scheme commensurate with the hazards associated with a permanently shut down and defueled facility. The proposed changes do not involve installation of new equipment or modification of existing equipment that could create the possibility of a new or different kind of accident. Also, 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 PNPS Emergency Plan and EAL scheme and do not impact operation of the facility 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 facility operation, and no accident analyses will be affected by the proposed changes. Safety analysis acceptance criteria are not affected by the proposed changes. The revised Emergency Plan will continue to provide the necessary response staff commensurate with the reduction in consequences of radiological events that will be possible at PNPS when the facility is in the permanently defueled condition and therefore, there is no reduction in the margin of safety.

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGES

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

Based on the above, ENO 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.

4.4 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 the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 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:

1. The amendment involves no significant hazards consideration.

As described in Section 4.3 of this evaluation, the proposed changes do not involve a significant hazards consideration.

2. There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

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

3. There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed changes do not involve any physical alterations to the facility 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, ENO 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 is required to be prepared in connection with the issuance of this amendment.

6.0 REFERENCES

1. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E," Letter No. CNRO-2018-00031, dated July 3, 2018
2. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Notification of Permanent Cessation of Power Operations," Letter Number 2.15.080, dated November 10, 2015 (ML15328A053)

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DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGES

3. Nuclear Energy Institute (NEI) 99-01, Revision 5, "Methodology for Development of Emergency Action Levels," dated February 22, 2008 (ML080450149)
4. Nuclear Energy Institute (NEI) 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012 (ML12326A805)
5. 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 (ML12346A463)
6. U.S. Environmental Protection Agency, "Protective Action Guides and Planning Guidance for Radiological Incidents," EPA-400/R-17-001, dated January 2017 (EPA PAG Manual)
7. NSIR/DPR-ISG-02, Interim Staff Guidance, Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants, dated May 11, 2015
8. NUREG-1465, "Accident Source Terms for Light-Water Nuclear Power Plants," dated February 1995 (ML041040063)
9. USNRC Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," July 2000
10. RG 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants," June 2003 (ML031530505)
11. GE Hitachi Nuclear Energy, Fuel Handling Accident in the Spent Fuel Pool Generic Dose Assessment, dated June 2009 (GEH Proprietary Information)
12. Commission Paper SECY-99-168, Improving Decommissioning Regulations for Nuclear Power Plants, dated June 30, 1999
13. NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," dated February 2001
14. NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," dated October 2002
15. Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" dated July 1998
16. NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor" September 2014 (ML14255A365)
17. Electric Power Research Institute, "Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation," EPRI 3002009564, 2017
18. Electric Power Research Institute, EPRI Report No. 1025286, "Seismic Walkdown Guidance: For Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic," 2012
19. PNPS Letter to NRC, Subject: "License Amendment Request to Revise the Pilgrim Nuclear Power Station Emergency Plan to Address the Permanently Defueled Condition," dated January 12, 2018 (Letter Number 2.18.004) (ML 10823A687)

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20. 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
21. 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, and Supplements (ML032580518, ML041550395, and ML051450482)
22. Letter, USNRC to Omaha Public Power District, Fort Calhoun Station Unit 1 – Issuance of Amendment Re: Revise Emergency Plan to the Permanently Defueled Emergency Plan and Permanently Defueled Emergency Action Level Scheme (CAC No. MF8951; EPID L-2016-LLA-0036)," dated December 12, 2017 (ML17276B286)
23. 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 (ML15233A166)
24. 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 (ML15105A349)
25. 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 (ML15126A461)
26. 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 (ML15027A209)
27. 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 (ML14279A482)
28. 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 MA5254)," dated August 31, 1999 (ADAMS Legacy No. 9909070087)
29. 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 (ML072680350)
30. Letter, USNRC to Connecticut Yankee Atomic Power Company, "Response to Exemption Request for Portions of Title 10 of the Code of Federal Regulations Part 50 Appendix E, and Title 10 of the Code of Federal Regulations Part 50.47 for the Haddam Neck Plant (TAC No. L24663)," dated March 18, 2013 (ML13064A374)

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31. Letter, USNRC to Dairyland Power Cooperative, "La Crosse Boiling Water Reactor – Issuance of Exemption From Certain Emergency Planning Requirements (TAC No. J00438)," dated July 31, 2013 (ML13008A565)
32. Letter, USNRC to Maine Yankee Atomic Electric Company, "Response to Exemption Request for Portions of Title 10 of the Code of Federal Regulations Part 50 Appendix E, and Title 10 of the Code of Federal Regulations Part 50.47 for the Maine Yankee Atomic Power Station (TAC No. L24661)," dated May 2, 2013 (ML13112A842)
33. Letter, USNRC to Yankee Rowe Plant ISFSI, "Response to Exemption Request for Portions of Title 10 of the Code of Federal Regulations Part 50 Appendix E, and Title 10 of the Code of Federal Regulations Part 50.47 for the Yankee Rowe Plant (TAC No. L24662)," dated May 7, 2013 (ML13121A560)

Attachment 2

Letter Number 2.18.035

Comparison Matrix for Permanently Defueled EALs Based on NEI 99-01, "Development of
Emergency Action Levels for Non-Passive Reactors," Revision 6

(36 pages follow)

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

Subject: Revise the PNPS Station Emergency Plan and Emergency Action Level Scheme to Address the Permanently Defueled Condition.

- 1.0 PURPOSE
- 2.0 DISCUSSION
- 3.0 KEY TERMINOLOGY USED
- 4.0 GUIDANCE ON MAKING EMERGENCY CLASSIFICATIONS
- 5.0 REFERENCES
- 6.0 DEFINITIONS AND ACRONYMS
- 7.0 PNPS TO NEI 99-01 EAL CROSS-REFERENCE
- 8.0 ATTACHMENTS
 - 8.1 Attachment 1, Recognition Category PD EAL Bases
 - 8.2 Attachment 2, Recognition Category E EAL Bases

Description of the Permanently Defueled EAL Technical Basis Document

This document provides a description of each section in the proposed Pilgrim Nuclear Power Station (PNPS) Permanently Defueled (PD) Emergency Action Level (EAL) Technical Bases Document and describes the results of a comparison of the proposed PNPS PD EAL scheme against the corresponding information contained in NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6.

1.0 PURPOSE

A comparison between this section and NEI 99-01 was not performed. The PNPS PD 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 nuclear power facility and Recognition Category "E" ICs for the Independent Spent Fuel Storage Installation (ISFSI).

2.0 DISCUSSION

This section was developed based on information contained in NEI 99-01 Rev. 6, Section 1, "Regulatory Background." Differences are discussed between the PNPS PD EAL Technical Bases Document and NEI 99-01, Rev. 6. It also provides a description of a permanently defueled station (Section 2.1) and an Independent Spent Fuel Storage Installation (ISFSI) (Section 2.2). It 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. ENO certified to the NRC that it plans to permanently cease power operations of PNPS no later than June 1, 2019 in accordance with 10 CFR 50.82, paragraph (a)(1)(i). Once certification of permanent removal of fuel from the reactor vessel is submitted to the NRC in accordance with 10 CFR 50.82, paragraph (a)(1)(ii), and docketed, the 10 CFR Part 50 license will no longer authorize operation of the reactor or emplacement of fuel in the reactor vessel in accordance with 10 CFR 50.82(a)(2). The EALs described in the PNPS PD EAL Technical Bases Document will be implemented after PNPS has permanently ceased power operations.

NEI 99-01, Section 1.5, "Applicability to Advanced and Small Modular Reactor Designs," was excluded because it does not apply to PNPS.

3.0 KEY TERMINOLOGY USED

Differences between the PNPS PD EALs Technical Bases Document and NEI 99-01, Rev. 6 are discussed below.

- References to Site Area Emergency and General Emergency were removed throughout the section. EALs have been developed using Section 8 for the ISFSI and Appendix C for the permanently defueled station ICs/EALs. Emergency Classification Levels only include Notification of Unusual Event (Unusual Event) and Alert.
- References to "plant" have been revised to "facility" to indicate that PNPS is no longer an operating nuclear power plant.
- In Section 3.2, "Initiating Condition (IC)" (Section 2.2 of NEI 99-01, Rev. 6), references to Reactor Coolant System (RCS) Leakage and fission product barriers were removed.

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Upon permanent cessation of power operations, the RCS and Containment will no longer be considered fission product barriers because the reactor will be permanently defueled. In the permanently defueled condition, the fuel cladding is a fission product barrier. However, the Recognition Category F matrices containing EALs referred to as Fission Product Barrier Thresholds, are not applicable in the permanently defueled condition.

- 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 was developed based on information contained in NEI 99-01, Section 5, "Guidance on Making Emergency Classifications." Differences between the PNPS Permanently Defueled EAL Technical Bases Document and NEI 99-01, Rev. 6 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 will no longer serve as fission product barriers upon permanent cessation of power operations and permanent removal of fuel from the reactor.
- In Section 4.1 (Section 5.1 of NEI 99-01), the second paragraph of NEI 99-01 stating that, "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 NSIR/DPR-ISG-02, Interim Staff Guidance, "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." PNPS will maintain the ability to assess, classify, and declare an emergency within 30 minutes. Emergency declaration is required to be made as soon as conditions warranting classification are present and recognizable, but within 30 minutes in all cases of conditions being present.

With respect to the notification of an emergency declaration to State and local authorities, no credible accident will result in radioactive releases that will exceed Environmental Protection Agency (EPA) Protective Action Guides (PAGs) beyond the site boundary. Additionally, there is sufficient time, resources, and personnel available to initiate mitigative actions that will prevent an offsite release that exceeds EPA PAGs. 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., fuel handling accident) develop over a significantly longer period. As such, a 15 minute notification requirement is unnecessarily restrictive. Sixty (60) minutes provides a reasonable amount of time to provide notification to state and local governmental authorities. This notification timeliness is also consistent with the notification requirement to the NRC Operations Center, contained in 10 CFR 50.72(a)(1)(i), for the declaration of an emergency class.

- In Section 4.2 (Section 5.2 in NEI 99-01), reference to Operating Mode Applicability was removed because Operating Modes 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 PNPS is a single unit site.

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- Information provided in Section 5.4 of NEI 99-01 was excluded from the PNPS PD EAL Technical Bases Document because mode changes during classification are not applicable to a permanently defueled facility.
- 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 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 at PNPS. Also removed references to "downgrading."
- In Section 4.6 (Section 5.7 of NEI 99-01) references to an operating plant short-lived event (reactor trip) were removed and replaced with verbiage applicable to a permanently defueled facility.
- In Section 4.7 (Section 5.8 of NEI 99-01) the example was removed because an emergency declaration associated with the auxiliary feedwater system is no longer credible at PNPS. The reference to the 15 minute emergency classification was excluded for reasons presented above.

5.0 REFERENCES

This section was added to provide developmental and implementing references applicable to the PNPS PD EAL Technical Bases Document. No corresponding section is included in NEI 99-01, Rev. 6.

6.0 DEFINITIONS AND ACRONYMS

This section was developed based on the information presented in Appendices A and B of NEI 99-01, Rev. 6. The list incorporates only those acronyms used in the PNPS PD EAL Technical Bases Document.

- The following definitions, included in NEI 99-01, Rev. 6, were excluded because they are not used in the PNPS 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 was not used in the PNPS 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 PNPS 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 PNPS PD EAL Technical Bases Document.

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Selected terms used in IC and EAL 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, Rev. 6. Definitions not used in the PNPS PD EAL Technical Bases Document were excluded.

The term "SAFETY SYSTEM" was excluded because only those systems required to maintain spent fuel cooling are necessary in the permanently shut down and defueled condition. These systems are not, by definition, SAFETY SYSTEMS.

7.0 PNPS TO NEI 99-01 EAL CROSS-REFERENCE

There is no corresponding section included in NEI 99-01, Rev. 6. This section was added to facilitate association and location of a PNPS PD EAL within the Appendix C NEI 99-01, Rev. 6 IC/EAL identification scheme. Further information regarding the development of the PNPS PD EALs based on the NEI guidance can be found in the Recognition Category "PD" and "ISFSI" EAL Comparison Matrices in the Attachment 1 and 2 comparisons, respectively.

8.0 ATTACHMENTS

8.1 Attachment 1, Recognition Category PD EAL Bases

- Attachment 1 of the PNPS PD EAL Technical Bases Document provides the PD IC/EALs and incorporates Appendix C of NEI 99-01, Rev. 6.
- Reference to Section 3 of NEI 99-01, Rev. 6 was excluded.
- References to Operating Modes were removed from Table PD-1.
- The table included in Attachment 1, "Comparison of PNPS PD IC/EAL against NEI 99-01, Appendix C, Rev. 6 for Recognition Category PD," provides a comparison of the PNPS PD EALs against the corresponding information contained in NEI 99-01, Rev. 6.

8.2 Attachment 2, Recognition Category E EAL Basis

- Attachment 2 of the PNPS PD EAL Technical Bases provides the ISFSI IC/EALs and incorporates Section 8 of NEI 99-01, Rev. 6.
- Reference to Operating Mode was removed from Table E-1.
- The table included in the Attachment 2, "Comparison of PNPS E IC/EAL against NEI 99-01, Rev. 6 for Recognition Category E," provides a comparison of the PNPS ISFSI EALs against the corresponding information contained in NEI 99-01, Rev. 6.

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NEI 99-01 Sections Not Included

The following sections of NEI 99-01, Rev. 6 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, Rev. 6 were removed from the PNPS Permanently Defueled 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

Attachment 1

**Comparison of PNPS PD IC/EAL against NEI 99-01, Appendix C, Rev.
6 for Recognition Category PD**

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison															
<p>PD-AU1</p> <p>ECL: Notification of Unusual Event</p> <p>Initiating Condition: 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>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>Notes:</p> <ul style="list-style-type: none">• 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.• 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>(1) Reading on ANY effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.</p>	<p>PD-AU1</p> <p>ECL: Unusual Event</p> <p>Initiating Condition: Release of gaseous or liquid radioactivity greater than 2 times the Offsite Dose Calculation Manual (ODCM) limits for 60 minutes or longer.</p> <p>Emergency Action Levels: (1 or 2)</p> <p>Notes:</p> <ul style="list-style-type: none">• 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.• 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>1. Reading on ANY Table A-1 effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.</p> <table><tr><th colspan="5">Table A-1 Effluent Monitor Classification Thresholds</th></tr><tr><th colspan="2">Release Point</th><th>Monitor</th><th>Alert</th><th>NOUE</th></tr><tr><td>Gaseous</td><td>Rx Bldg Vent Exhaust</td><td>RM-1705-32A/B (Panel C910 – units of cps)</td><td>2.75E5 cps</td><td>2X HI-HI Alarm</td></tr></table>	Table A-1 Effluent Monitor Classification Thresholds					Release Point		Monitor	Alert	NOUE	Gaseous	Rx Bldg Vent Exhaust	RM-1705-32A/B (Panel C910 – units of cps)	2.75E5 cps	2X HI-HI Alarm	<ul style="list-style-type: none">• Changed “Notification of Unusual Event” to “Unusual Event” to maintain continuity with the previous PNPS action level scheme.• Inserted Offsite Dose Calculation Monitor (ODCM) as the site specific effluent release controlling document.• Removed Operating Mode Applicability as it does not apply in a permanently defueled condition• Removed “Example” from Emergency Action Levels as they are no longer examples.• Included Table A-1 to provide effluent monitor description and threshold values, and show escalation path.• Replaced “2 times the alarm setpoint established by a current radioactivity discharge permit” with “2 X HI-HI Alarm”.
Table A-1 Effluent Monitor Classification Thresholds																	
Release Point		Monitor	Alert	NOUE													
Gaseous	Rx Bldg Vent Exhaust	RM-1705-32A/B (Panel C910 – units of cps)	2.75E5 cps	2X HI-HI Alarm													

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS					Comparison
(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.	Liquid	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm	
	2. Sample analysis for a gaseous or liquid release indicates a concentration or release rate greater than two times the ODCM limits for 60 minutes or longer.					
NEI 99-01 Basis: 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. 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	PNPS Station 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. PNPS incorporates 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. 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					<ul style="list-style-type: none">• Added PNPS specific basis information.• Replaced “plant” with “facility”.• Added additional site specific information regarding radiation monitors and annunciator panels and references for the information added.

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>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>EAL #2 - This EAL addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or</p>	<p>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>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>The radiation monitor that detects gaseous radioactivity effluent release to the environment is the Reactor Building Ventilation Exhaust (RBVE) monitors RM-1705-32A/B (Ref. 1).</p> <p>The RBVE monitor alarms whenever effluent radioactivity release levels approach unacceptable limits. Indication of RBV effluent is provided by process radiation monitors RM-1705-32A/B on Panel C910 and recorder 40-RR-1705-24 on Panel C902 (Ref. 1).</p> <p>Complete assumptions and inputs for these EAL threshold values are documented from the calculation in Radiological Gaseous Effluent EAL Values (Ref. 2).</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,</p>	

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>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>heat exchanger leakage in river water systems, etc.).</p> <p>Liquid releases in excess of two times the Hi-Hi alarm that continue for greater than 60 minutes represent an uncontrolled situation and, hence, a potential degradation in the level of safety. The final integrated dose (which is very low in the Unusual Event emergency class) is not the primary concern here; it is the degradation in facility control implied by the fact that the release was not isolated within 60 minutes.</p> <p>Indication of radwaste effluent is provided by process radiation monitor RM-1705-30 on Panel C910 and recorder RR-1792 (red pen) on Panel C20 (Radwaste Control Room). The Radwaste Effluent Radiation Monitoring System monitors radwaste discharges to the discharge canal and provides alarm and automatic isolation functions if radioactivity levels exceed predetermined setpoints. The alarm and isolation setpoints are calculated for each discharge to ensure ODCM liquid effluent limits are not exceeded (Ref. 3, 4).</p> <p>At low classification levels, the concern for classification is the continuing, uncontrolled release of radioactivity and not the magnitude of the release. When the liquid release is isolated, the release is no longer continuing nor is it uncontrolled. Therefore, the classification is not appropriate when the liquid release is isolated. Radwaste effluent discharge isolation valves FV-7214A and B close if radwaste effluent radiation levels exceed the Hi-Hi alarm setpoint (Ref. 5).</p> <p>EAL 2 addresses collecting liquid and gaseous effluent samples to ensure that release conditions above nominal steady state conditions are detected and reported (Refs. 6, 7).</p> <p>Escalation of the emergency classification level would be via</p>	

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
	<p>IC PD-AA1.</p> <p>PNPS Basis Reference(s):</p> <ol style="list-style-type: none"> 1. PNPS ODCM Section 7.2.3, Reactor Building Exhaust Vent Monitor System 2. PNPS 082-CALC-001 Revision 0, PD-AA1 Gaseous Effluent EAL Threshold 3. PNPS ODCM Section 7.1.1, Liquid Radioactive Waste Effluent Release 4. PNPS ODCM Section 8.1, Liquid Effluent Monitor 5. PNPS ODCM Section 7.2.1, Liquid Radioactive Waste Effluent Monitoring System 6. PNPS ODCM Table 4.3-1, Radioactive Gaseous Waste Sampling and Analysis Program 7. PNPS ODCM Table 4.2-1, Radioactive Liquid Waste Sampling and Analysis Program 	

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>PD-AA1 ECL: Alert Initiating Condition: Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE. Operating Mode Applicability: Not Applicable Example Emergency Action Levels: (1 or 2 or 3 or 4) Notes:</p> <ul style="list-style-type: none"> • 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. • 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. 	<p>PD-AA1 ECL: Alert Initiating Condition: Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE. Emergency Action Levels: (1 or 2 or 3 or 4) Notes:</p> <ul style="list-style-type: none"> • 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. • 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. 	<ul style="list-style-type: none"> • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition • Removed "Example" from Emergency Action Levels as they are no longer examples.

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison																							
<p>1) Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer:</p> <p>(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>4) Field survey results indicate EITHER of the following at or beyond (site-specific dose receptor point):</p> <ul style="list-style-type: none">• Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer.• Analyses of field survey samples indicate thyroid CDE greater than 50 mrem for one hour of inhalation.	<p>1. Reading on ANY Table A-1 effluent radiation monitor that is greater than the reading shown in column "Alert" for 15 minutes or longer.</p> <table><tr><th colspan="5">Table A-1 Effluent Monitor Classification Thresholds</th></tr><tr><th colspan="2">Release Point</th><th>Monitor</th><th>Alert</th><th>NOUE</th></tr><tr><td rowspan="2">Gaseous</td><td rowspan="2">Rx Bldg Vent Exhaust</td><td>RM-1705-32A/B (Panel C910 – units of cps)</td><td>2.75E5 cps</td><td>2X HI-HI Alarm</td></tr><tr><td></td><td></td><td></td></tr><tr><td>Liquid</td><td>Radwaste Discharge Effluent</td><td>RM-1705-30 (Panel C910 – units of cps)</td><td>N/A</td><td>2X HI-HI Alarm</td></tr></table> <p>2. Dose assessment using actual meteorology indicates doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the site boundary.</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 the site boundary.</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">• Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer.• Analyses of field survey samples indicate thyroid CDE greater than 50 mrem for one hour	Table A-1 Effluent Monitor Classification Thresholds					Release Point		Monitor	Alert	NOUE	Gaseous	Rx Bldg Vent Exhaust	RM-1705-32A/B (Panel C910 – units of cps)	2.75E5 cps	2X HI-HI Alarm				Liquid	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm	<ul style="list-style-type: none">• Added additional site-specific information regarding radiation monitors and annunciator panels and references for the information added.• Included Table A-11 to provide effluent monitor description and threshold values, and show escalation path.• Added "site boundary" as the site specific dose receptor point.
Table A-1 Effluent Monitor Classification Thresholds																									
Release Point		Monitor	Alert	NOUE																					
Gaseous	Rx Bldg Vent Exhaust	RM-1705-32A/B (Panel C910 – units of cps)	2.75E5 cps	2X HI-HI Alarm																					
Liquid	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm																					

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
	<p align="center">of inhalation.</p>	
<p>NEI 99-01 Basis:</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 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</p>	<p>PNPS Station Basis:</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</p>	<ul style="list-style-type: none"> • Replaced “plant” with “facility”. • Added additional site specific information regarding radiation monitors and annunciator panels and references for the information added.

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>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>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>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>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>The radiation monitor that detects gaseous radioactivity effluent release to the environment is the Reactor Building Ventilation Exhaust (RBVE) monitors RM-1705-32A/B on Panel C910 (ref.1).</p> <p>Complete assumptions and inputs for these EAL threshold values are documented from the calculation in PNPS082-CALC-001 Revision 0, PD-AAL Gaseous Effluent EAL Threshold (ref. 2).</p> <p>The threshold of $> 2.75E5$ is limited to a maximum value of $8E+5$ cps to assure an on-scale readable value.</p> <p>PNPS Basis Reference(s):</p> <ol style="list-style-type: none"> 1. PNPS ODCM Section 7.2.3, Reactor Building Exhaust Vent Monitor System 2. PNPS082-CALC-001 Revision 0, PD-AA1 Gaseous Effluent EAL Threshold 3. PNPS ODCM Section 7.1.1, Liquid Radioactive Waste Effluent Release 4. PNPS ODCM Section 8.1, Liquid Effluent Monitor 	

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
	5. PNPS ODCM Section 7.2.1, Liquid Radioactive Waste Effluent Monitoring System 6. PNPS ODCM Table 4.2-1 Radioactive Liquid Waste Sampling and Analysis Program 7. PNPS ODCM Table 4.3-1 Radioactive Gaseous Waste Sampling and Analysis Program	

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<p align="center">NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs</p>	<p align="center">Proposed Permanently Defueled EAL for PNPS</p>	<p align="center">Comparison</p>
<p>PD-AU2</p> <p>ECL: Notification of Unusual Event</p> <p>Initiating Condition: UNPLANNED rise in plant radiation levels.</p> <p>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>(1) a. UNPLANNED water level drop in the spent fuel pool as indicated by ANY of the following:</p> <p align="center">(Site specific level indications).</p> <p align="center">AND</p> <p>b. UNPLANNED rise in area radiation levels as indicated by ANY of the following radiation monitors:</p> <p align="center">(Site specific level indications).</p> <p>(2) Area radiation monitor reading or survey result indicates an UNPLANNED rise of 25 mR/hr over NORMAL LEVELS.</p>	<p>PD-AU2</p> <p>ECL: Unusual Event</p> <p>Initiating Condition: UNPLANNED rise in facility radiation levels.</p> <p>Emergency Action Levels: (1 or 2)</p> <p>(1)</p> <p>a. UNPLANNED water level drop in the spent fuel pool as indicated by ANY of the following:</p> <ul style="list-style-type: none"> • "SPENT FUEL POOL LEVEL LO" (C903R-B2) • "FUEL POOL LOW LEVEL" (C39-F1) <p align="center">AND</p> <p>b. UNPLANNED rise in area radiation levels as indicated by the following radiation monitor:</p> <ul style="list-style-type: none"> • Spent Fuel Pool Area (RIS-1815-3F) <p>(2) Area Radiation monitor reading or survey result indicates an UNPLANNED rise of 25 mR/hr over NORMAL LEVELS.</p>	<ul style="list-style-type: none"> • Replaced "plant" with "facility." • Changed "Notification of Unusual Event" to "Unusual Event" to maintain continuity with the previous PNPS action level scheme. • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition • Removed "Example" from Emergency Action Levels as they are no longer examples. • Added site specific level indications.

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<p>NEI 99-01 Basis:</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>PNPS Station Basis:</p> <p>This IC addresses elevated facility 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 facility or radioactive materials. Either condition is a potential degradation in the level of safety of the facility.</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 facility 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>Spent fuel pool level instruments LI-4816A and LI-4816B, located on the back wall of the Control Room, provide a wide range indication of level in the spent fuel pool.</p> <p>PNPS Basis Reference(s):</p> <ol style="list-style-type: none"> 1. PNPS 2.2.85, <i>"Fuel Pool Cooling and Filtering System"</i> 2. EC 45088, Fukushima - Spent Fuel Pool Level Instrumentation 	<ul style="list-style-type: none"> • Added PNPS site-specific basis information, instrumentation and documented references. • Replace "plant" with "facility".
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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>PD-AA2</p> <p>ECL: Alert</p> <p>Initiating Condition: UNPLANNED rise in plant radiation levels that impedes plant access required to maintain spent fuel integrity.</p> <p>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>(1) UNPLANNED dose rate greater than 15 mR/hr in ANY of the following areas requiring continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:</p> <p style="padding-left: 40px;">(site-specific area list)</p> <p>(2) UNPLANNED Area Radiation Monitor readings or survey results indicate a rise by 100 mR/hr in ANY of the following areas needed to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity.</p> <p style="padding-left: 40px;">(site specific area list)</p>	<p>PD-AA2</p> <p>ECL: Alert</p> <p>Initiating Condition: UNPLANNED rise in facility radiation levels that impedes facility access required to maintain spent fuel integrity.</p> <p>Emergency Action Levels: (1 or 2)</p> <p>1. UNPLANNED dose rate greater than 15 mR/hr in ANY of the following areas requiring 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"> • Main Control Room (RIS-1815-2A, Panel C911) • Central Alarm Station (CAS) (by survey) <p>OR</p> <p>2. UNPLANNED Area Radiation Monitor readings or survey indicate a rise by 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.</p> <ul style="list-style-type: none"> • Aux Bay 3' elevation • Reactor Building 117' elevation, Refueling Floor • Reactor Building 74' elevation, North • Reactor Building 91' elevation, South and West 	<ul style="list-style-type: none"> • Replaced "plant" with "facility". • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition • Removed "Example" from Emergency Action Levels as they are no longer examples. • Reworded the EAL #2 to provide better guidance concerning access to areas. • Added site specific areas
<p>Basis:</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</p>	<p>PNPS Station Basis:</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</p>	<ul style="list-style-type: none"> • Added definitions for NORMAL LEVELS and UNPLANNED. • Replace "plant" with "facility". • Added PNPS site-specific basis information, instrumentation and documented references.

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>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>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. Areas that meet this threshold include the Main Control Room and the Central Alarm Station (CAS).</p> <p>The Main Control Room Area Radiation Monitor (ARM) RIS-1815-2A on Panel C911 provides indication of area radiation levels in the Main Control Room. The high alarm of the Main Control Room ARM activates Control Room annunciator B7 ("CONTROL ROOM RAD HI") on Panel C904LC. The high alarm is set at approximately 1 mR/hr. (ref. 1, 2, 3).</p> <p>The CAS area has no permanently installed area radiation monitors that may be used to assess this EAL threshold. Therefore, this threshold must be assessed via local radiation survey (ref. 4).</p> <p>PNPS Basis Reference(s):</p> <ol style="list-style-type: none"> 1. PNPS 2.2.62, "Area Radiation Monitoring System" 2. PNPS 6.5-160, "Calibration of the Area Radiation Monitoring System" 3. PNPS ARP-C904LC-B7 4. PNPS 6.3-064, "Routine Radiological Surveillance Program" 	

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>PD-HU1</p> <p>ECL: Notification of Unusual Event</p> <p>Initiating Condition: Confirmed SECURITY CONDITION or threat.</p> <p>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <ol style="list-style-type: none"> 1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the (site-specific security shift supervision). 2. Notification of a credible security threat directed at the site. 3. A validated notification from the NRC providing information of an aircraft threat. 	<p>PD-HU1</p> <p>ECL: Unusual Event</p> <p>Initiating Condition: Confirmed SECURITY CONDITION or threat.</p> <p>Emergency Action Levels: (1 or 2 or 3)</p> <ol style="list-style-type: none"> 1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the Station Security Force. 2. Notification of a credible security threat directed at the site. 3. A validated notification from the NRC providing information of an aircraft threat. 	<ul style="list-style-type: none"> • Changed “Notification of Unusual Event” to “Unusual Event” to maintain continuity with the previous PNPS action level scheme. • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition. • Removed “Example” from Emergency Action Levels as they are no longer examples. • Station Security Force is provided as the site-specific security shift supervision.
<p>NEI 99-01 Basis:</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</p>	<p>PNPS Station Basis:</p> <p>This IC addresses events that pose a threat to facility personnel or the equipment necessary to maintain cooling of spent fuel, 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 IC PD-HA1.</p> <p>Timely and accurate communications between the Station Security Force 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</p>	<ul style="list-style-type: none"> • Replace “plant” with “facility”. • Added PNPS site-specific basis information, instrumentation and documented references.

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>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>Security plans and terminology are based on the guidance provided by NEI 03-12, <i>Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program]</i>.</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</p>	<p>facility personnel and OROs.</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, Safeguards Contingency Plan [and Independent Spent Fuel Storage Installation Security Program]</i>.</p> <p>EAL #1 references the Station 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>EAL #2 addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with PNPS 5.3.14, "Security Incidents" (Ref. 1.)</p> <p>EAL #3 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 PNPS 5.3.14.1, "Airborne Threat" (Ref. 2.)</p> <p>PNPS Basis Reference(s):</p> <ol style="list-style-type: none"> 1. PNPS 5.3.14, "Security Incidents" 2. PNPS 5.3.14.1, "Airborne Threat" 	

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>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>		

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>PD-HA1</p> <p>ECL: Alert</p> <p>Initiating Condition: HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.</p> <p>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels: (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>PD-HA1</p> <p>ECL: Alert</p> <p>Initiating Condition: HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.</p> <p>Emergency Action Levels: (1 or 2)</p> <ol style="list-style-type: none"> 1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the Station Security Force. 2. A validated notification from NRC of an aircraft attack threat within 30 minutes of the site. 	<ul style="list-style-type: none"> • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition. • Removed "Example" from Emergency Action Levels as they are no longer examples. • Station Security Force is provided as the site-specific security shift supervision.
<p>NEI 99-01 Basis:</p> <p>This IC addresses the 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.</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, Safeguards</i></p>	<p>PNPS Basis:</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 facility and staff for a potential aircraft impact.</p> <p>Timely and accurate communications between Station Security Force 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, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security</i></p>	<ul style="list-style-type: none"> • Replaced "plant" with "facility". • Provided additional information for each of the 2 EALs

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<p><i>Contingency Plan [and Independent Spent Fuel Storage Installation Security Program].</i></p> <p>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.</p> <p>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.</p> <p>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.</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</p>	<p><i>Program].</i></p> <p>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, allowing them to be better prepared should it be necessary to consider further actions.</p> <p>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.</p> <p>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.</p> <p>EAL #2 is met when the threat-related information has been validated in accordance with PNPS 5.3.14, "Security Incidents" (Ref. 1.)</p> <p>PNPS Basis Reference(s):</p> <ol style="list-style-type: none"> 1. PNPS 5.3.14, Security Incidents 	

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<p>a timely manner so that plant 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 (site-specific procedure).</p> <p>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>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>		

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<p>PD-HU2</p> <p>ECL: Notification of Unusual Event</p> <p>Initiating Condition: Hazardous event affecting SAFETY SYSTEM equipment necessary for spent fuel cooling.</p> <p>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels:</p> <p>(1) a. The occurrence of ANY of the following hazardous events:</p> <ul style="list-style-type: none"> • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • (site-specific hazards) • Other events with similar hazard characteristics as determined by the Shift Manager <p>AND</p> <p>b. The event has damaged at least one train of a SAFETY SYSTEM needed for spent fuel cooling.</p> <p>AND</p> <p>c. The damaged SAFETY SYSTEM train(s) cannot, or potentially cannot, perform its design</p>	<p>PD-HU2</p> <p>ECL: Unusual Event</p> <p>Initiating Condition: Hazardous event affecting equipment necessary for spent fuel cooling.</p> <p>Emergency Action Levels:</p> <p>(1)</p> <p>a. The occurrence of ANY of the following hazardous events:</p> <ul style="list-style-type: none"> • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • Seawater bay level > +13'6" MSL (LI-3831A/B) • Seawater bay level < -13'9" MSL (LI-3831A/B) • Other events with similar characteristics as determined by the Control Room Supervisor <p>AND</p> <p>b. The event has damaged at least one train of a system needed for spent fuel cooling.</p> <p>AND</p> <p>c. The damaged system train(s) cannot, or potentially cannot, perform its design function based on EITHER</p> <ul style="list-style-type: none"> • Indications of degraded performance • VISIBLE DAMAGE 	<ul style="list-style-type: none"> • Changed "Notification of Unusual Event" to "Unusual Event" to maintain continuity with the previous PNPS action level scheme. • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition. • Removed "Example" from Emergency Action Levels as they are no longer examples. • Added low bay level as site specific hazard. • Removed "SAFETY SYSTEM" as the term is not applicable in the permanently shut down and defueled condition.

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<p>function based on EITHER:</p> <ul style="list-style-type: none"> • Indications of degraded performance • VISIBLE DAMAGE 		
<p>NEI 99-01 Basis:</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>PNPS Station Basis:</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 EAL 1.c, the first bullet addresses damage to equipment 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 equipment 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. As illustrated in Figure H-1 (ref. 1, 2), ground level at the greenhouse is +21'6" MSL and well above the flood level of +13'6" MSL. Since the entrances to all structures containing equipment necessary for SFP cooling are at elevations well above +13'6" MSL, they are protected against flooding from external sources. Seawater bay water level < -13'9" MSL is the design minimum level for</p>	<ul style="list-style-type: none"> • Replaced "plant" with "facility". • Figure H-1 added to basis to support bay level impact. Figure H-1 is not included in this document.

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	<p>the SSW pumps.</p> <p>PNPS Basis Reference(s):</p> <ol style="list-style-type: none"> 1. PNPS 2.2.94, <i>"Seawater System"</i> 2. PNPS 2.4.154, <i>"Intake Structure Fouling"</i> 3. PNPS 2.2.32, <i>"Salt Service Water System (SSW)"</i> 4. PNPS 8.E.29, <i>"Salt Service Water System Instrumentation Calibration"</i> 	

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<p>PD-HU3</p> <p>ECL: Notification of Unusual Event</p> <p>Initiating Condition: Other conditions exist which in the judgment of the Emergency Director warrant declaration of a (NO)UE.</p> <p>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels:</p> <p>(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>PD-HU3</p> <p>ECL: Unusual Event</p> <p>Initiating Condition: Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Unusual Event.</p> <p>Emergency Action Levels:</p> <ol style="list-style-type: none"> 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 systems needed to maintain spent fuel cooling occurs. 	<ul style="list-style-type: none"> • Changed "Notification of Unusual Event" to "Unusual Event" to maintain continuity with the previous PNPS action level scheme. • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition. • Removed "Example" from Emergency Action Levels as they are no longer examples. • Replaced "plant" with "facility". • Removed "SAFETY SYSTEM" as the term is not applicable in the permanently shut down and defueled condition.
<p>NEI 99-01 Basis:</p> <p>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>PNPS Station Basis:</p> <p>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>	

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>PD-HA3</p> <p>ECL: Alert</p> <p>Initiating Condition: Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert.</p> <p>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels:</p> <ol style="list-style-type: none"> 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>PD-HA3</p> <p>ECL: Alert</p> <p>Initiating Condition: Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert.</p> <p>Emergency Action Levels:</p> <ol style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition. • Removed "Example" from Emergency Action Levels as they are no longer examples. • Replaced "plant" with "facility".
<p>NEI 99-01 Basis:</p> <p>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>PNPS Station Basis:</p> <p>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>	

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NEI 99-01 Rev 6 Appendix C – Permanently Defueled Station ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>PD-SU1</p> <p>ECL: Notification of Unusual Event</p> <p>Initiating Condition: UNPLANNED spent fuel pool temperature rise.</p> <p>Operating Mode Applicability: Not Applicable</p> <p>Example Emergency Action Levels:</p> <p>(1) UNPLANNED spent fuel pool temperature rise to greater than (site-specific °F).</p>	<p>PD-SU1</p> <p>ECL: Unusual Event</p> <p>Initiating Condition: UNPLANNED spent fuel pool temperature rise.</p> <p>Emergency Action Levels:</p> <p>1. UNPLANNED spent fuel pool temperature rise to greater than 125 °F.</p>	<ul style="list-style-type: none"> • Changed “Notification of Unusual Event” to “Unusual Event” to maintain continuity with the previous PNPS action level scheme. • Removed Operating Mode Applicability as it does not apply in a permanently defueled condition. • Removed “Example” from Emergency Action Levels as they are no longer examples. • Site specific temperature added.
<p>NEI 99-01 Basis:</p> <p>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.</p> <p>Escalation of the emergency classification level would be via IC PD-AA1 or PD-AA2.</p>	<p>PNPS Station Basis:</p> <p>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.</p> <p>Escalation of the emergency classification level would be via IC PD-AA1 or PD-AA2.</p> <p>PNPS Basis Reference(s):</p> <p>1. FSAR Section 10.4.2</p>	<ul style="list-style-type: none"> • Replaced “plant” with “facility”.

Attachment 2
Comparison of PNPS E IC/EALs against NEI 99-01, Rev. 6 for
Recognition Category E

PNPS Station

Proposed ISFSI ICs/EALs

NEI 99-01 Rev 6, Section 8 ISFSI ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>E-HU1</p> <p>ECL: Notification of Unusual Event</p> <p>Initiating Condition: Damage to a loaded cask CONFINEMENT BOUNDARY.</p> <p>Example Emergency Action Levels:</p> <p>(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>E-HU1</p> <p>ECL: Unusual Event</p> <p>Initiating Condition: Damage to a loaded cask CONFINEMENT BOUNDARY.</p> <p>Emergency Action Levels:</p> <p>(1) Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than EITHER of the following:</p> <ul style="list-style-type: none"> 60 mrem/hr (gamma + neutron) on the top of the OVERPACK <p>OR</p> <ul style="list-style-type: none"> 600 mrem/hr (gamma + neutron) on the side of the OVERPACK, excluding inlet and outlet ducts 	<ul style="list-style-type: none"> Changed "Notification of Unusual Event" to "Unusual Event" to maintain continuity with the previous PNPS action level scheme. Removed Operating Mode Applicability as it does not apply in a permanently defueled condition. Removed "Example" from Emergency Action Levels as they are no longer examples. Included the site-specific technical specification values
<p>Basis:</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</p>	<p>PNPS Station Basis:</p> <p>CONFINEMENT BOUNDARY: The irradiated fuel dry storage cask barrier(s) between areas containing radioactive substances and the environment.</p> <p>This IC addresses an event that results in damage to the CONFINEMENT BOUNDARY of a storage cask containing</p>	<ul style="list-style-type: none"> Added PNPS site-specific basis information, instrumentation and documented references. Figure E-1 added to basis to provide a visual aid of inlet and outlet ducts and the general arrangement of the

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NEI 99-01 Rev 6, Section 8 ISFSI ICs/EALs	Proposed Permanently Defueled EAL for PNPS	Comparison
<p>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>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>While multiple loading arrangements may exist at any one time, the administrative controls regarding on-contact radiation readings are consistent for all loading arrangements at PNPS. On-contact radiation readings are defined as 30 mrem/hr on the top of the overpack, and 300 mrem/hr on the sides of the overpack, excluding near the inlet and outlet ducts per the cask system technical specifications (Ref. 1). The thresholds in this EAL incorporate the two times multiple described above.</p> <p>Figure E-1 illustrates the HI-STORM 100 Overpack.</p> <p>Security-related events for ISFSIs are covered under ICs HU1 and HA1.</p> <p>PNPS Basis Reference(s):</p> <p>1. Technical Specifications for the HI-STORM 100 Cask System, Administrative Control 5.7.4</p>	<p>storage cask overpack. Figure E-1 is not included in this document.</p>

Enclosure 1

Letter Number 2.18.035

PNPS Permanently Defueled Emergency Plan

(43 pages follow)

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

FOREWORD

As required in the conditions set forth by the Nuclear Regulatory Commission for the operating license for the Pilgrim Nuclear Power Station, the management of Entergy Nuclear Operations, Inc., ("Entergy") recognizes its responsibility and authority to maintain the Pilgrim Nuclear Power Station in such a manner as to provide for the safety of the general public.

This Emergency Plan has been prepared to establish the procedures and practices for management control over unplanned or emergency events that may occur at the Pilgrim Nuclear Power Station.

The issuance and control of this Emergency Plan and the Activities associated with emergency preparedness at the Pilgrim Nuclear Power Station shall be the responsibility of the Senior Nuclear Executive. The Emergency Plan and its implementing procedures meet the requirements for quality assurance as set forth in the Entergy Quality Assurance Program Manual.

The Decommissioning Director is assigned the responsibility for the maintenance of the Emergency Preparedness Programs associated with the operation of Pilgrim Nuclear Power Station as outlined in this document.

Manager, Emergency Preparedness

Date: _____

Review Committee

Date: _____

Decommissioning Director

Date: _____

Conformance to the practices described in this Permanently Defueled Emergency Plan and the procedures, which implement it, are required as of the effective date.

Effective Date: _____

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

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PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

1.0 INTRODUCTION

The Permanently Defueled Emergency Plan (PDEP) describes the plan for responding to emergencies that may arise at the Pilgrim Nuclear Power Station (PNPS) while in a permanently shut down and defueled configuration. PNPS has provided certification to the U.S. Nuclear Regulatory Commission (NRC) required by 10 Code of Federal Regulations (CFR) 50.82(a)(1)(i) and (ii) that PNPS has permanently ceased power operations and that all fuel has been permanently removed from the reactor vessel. In this configuration, all irradiated fuel is 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 facility is prohibited from emplacement or retention of fuel in the reactor vessel. The PDEP adequately addresses the risks associated with PNPS's current conditions.

The analysis of the potential radiological impacts of design basis accidents 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, as detailed in the EPA's "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents," (EPA-400/R-17/001) dated January 2017. No remaining postulated accidents will result in radiological releases requiring offsite protective actions and the slow progression rate of beyond design basis accident scenarios indicate sufficient time is available to initiate appropriate mitigating actions to protect the health and safety of the public. Therefore, the PDEP adequately addresses the risk associated with PNPS's permanently defueled condition and continues to provide adequate protection for plant personnel and the public.

This Plan documents the methods by which the PNPS Emergency Preparedness Program meets the criteria set forth in 10 CFR Part 50, Section 47(b) and Appendix E, as exempted. Exemptions from the applicable portions of 10 CFR 50.47(b), Appendix E to 10 CFR Part 50, and 10 CFR 50.47(c) were previously approved by the NRC.

1.1 Overview of the Permanently Defueled Emergency Plan

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

This plan is activated by the Control Room Supervisor/Emergency Director upon identification of an emergency situation based upon the Emergency Action Level (EAL) criteria. The emergency measures described in the subsequent sections and associated Emergency Plan Implementing Procedures (EPIPs) are in accordance with the classification and nature of the emergency at the direction of the Control Room Supervisor/Emergency Director.

This plan describes the organization and responsibilities for implementing emergency measures. It describes interfaces with Federal, State, and local organizations that may be notified in the event of an emergency and may provide assistance. Emergency fire, ambulance, and law enforcement services are provided by local public and private entities. Fixed medical services are provided by Beth Israel Deaconess Hospital - Plymouth and Morton Memorial Hospitals.

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Because there are no postulated accidents that would result in offsite dose consequences that are large enough to require offsite emergency planning, emergencies are divided into two classifications: Unusual Event (UE) and Alert. This 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. Current Federal guidance provided in the EPA's, "Protective Action Guides and Planning Guidance for Radiological Incidents, EPA-400/R-17/001," dated January 2017, Section 2.2.4, "PAGs and Nuclear Facilities Emergency Planning Zones (EPZ)," states that the EPZ is based on the maximum distance at which a PAG might be exceeded. If determined appropriate by government officials, protective actions may be implemented to protect the public using the existing all hazards emergency planning.

PNPS 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 EPIPs are established and maintained. A list of EPIPs is included in Appendix A.

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

The terms "PNPS" and "facility" as used in this document include the Independent Spent Fuel Storage Installation (ISFSI). The philosophy that guides the development and maintenance of this program is the protection of the health and safety of the general public in the communities around PNPS and the personnel who work at the plant.

1.1.1 Purpose

The purpose of the PDEP is to assure an adequate level of response to cope with the spectrum of postulated emergencies, 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 organizations expected to respond to potential emergencies. This plan is updated as necessary, in accordance with guidance provided by Emergency Preparedness Administrative Procedures. All changes to the PDEP are reviewed in accordance with 10 CFR 50.54(q).

The PNPS Emergency Plan outlines the basis for response actions that would be implemented in an emergency. This document is not intended to be used as a procedure. Detailed PNPS Emergency Plan Implementing Procedures are maintained separately and used to guide those responsible for implementing emergency actions.

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

1.1.2 Scope

The PDEP has been developed to respond to potential emergencies at PNPS considering the permanently shut down and defueled condition. There are no postulated accidents that would result in offsite dose consequences that are large enough to require offsite emergency planning. Therefore, 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.

If such an emergency were to occur, the PNPS Emergency Response Organization (ERO) (as defined in this plan) would be put in place and maintained until such time the plant was returned to a stable condition. This plan describes the operation of the PNPS ERO. It does not, nor is it intended to provide guidance for actual plant equipment manipulations. An emergency recovery phase is also described in this plan.

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 formatted in a manner 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 Plants" (NUREG-0654). The use of this format lends itself to verification of meeting the criteria set forth in NUREG-0654. Appendix B contains a cross-reference to the applicable guidance in NUREG-0654.

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

1.1.3 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 directions of activity within the facility to limit the consequences of the incident;
- 3) To establish an organization for control of assessment activities to determine the extent and significance of any uncontrolled release of radioactive material;
- 4) To identify facilities, equipment, and supplies available for emergency use;

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

1.2 Site Description

PNPS has permanently ceased power operations and has certified that fuel has been permanently removed from the reactor vessel. The license for PNPS, under 10 CFR 50, no longer authorizes operation of the reactor or emplacement or retention of fuel in the reactor vessel, as specified in 10 CFR 50.82(a)(2).

PNPS is located in the town of Plymouth, Plymouth County, in the Commonwealth of Massachusetts. It is situated on the western coast of Cape Cod Bay, on approximately 1600 acres of land, owned by Entergy. A detailed description of the plant is given in the PNPS Defueled Safety Analysis Report (DSAR). The ISFSI consists of HI-STORM vertical dry spent fuel storage casks on a concrete slab located within the protected area. A detailed description of the HI-STORM storage casks is given in the HI-STORM 100 Cask System DSAR.

The primary hazard consideration at PNPS is the potential unplanned release of radioactive material resulting from an accident involving the SFP. The probability of such a release is considered very low due to plant design and strict operational guidelines enforced by the Nuclear Regulatory Commission (NRC).

10 CFR 72.32 specifies the regulatory requirements for an ISFSI emergency plan. In accordance with 10 CFR 72.32(c), the emergency plan required by 10 CFR 50.47 satisfies the requirements for an emergency plan for an ISFSI which is located within the exclusion area of the nuclear power reactor, and therefore a separate ISFSI emergency plan is not required.

2.0 ORGANIZATIONAL RESPONSIBILITY

A predesignated group is assigned to various roles during an event to ensure capable emergency response and mitigation at PNPS. These assignments are made to ensure that the administrative, managerial, and technical support needed for accident mitigation are met. A sufficient number of individuals are assigned to these positions to ensure around-the-clock and continued long-term support.

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Responsibility for emergency response lies with the Control Room Supervisor. The Control Room Supervisor assumes the Emergency Director position upon declaration of an emergency. This command and control position is responsible for ensuring the continuity of resources through an event.

The ERO augments the normal on-shift organization to respond to declared emergencies when activated. ERO personnel are trained and assigned to a position based on job qualifications or by being specifically trained to fill the position. The ERO is activated at the Alert declaration or at the discretion of the Control Room Supervisor/Emergency Director. The designated on-shift and augmented ERO staff are capable of continuous (24-hour) operations for a protracted period.

Procedures for training and maintenance of the emergency organization are in place to assure 24-hour per day staffing for emergency response. The normal on-shift complement provides the initial response to an emergency. This group is trained to handle emergency situations, e.g. initiate the implementation of the PNPS Emergency Plan, and make initial accident assessment, emergency classification, notifications, and protective action recommendations until Emergency Response Organization activation occurs.

The minimum staff required to conduct routine and immediate emergency mitigation is maintained at the facility.

2.1 Facility On-Shift Organization

During normal conditions, the minimum staff on duty at the facility during all shifts consists of one (1) Control Room Supervisor, one (1) Non-Certified Operator (NCO), and one (1) Radiation Protection Technician. Security personnel are maintained in accordance with the Security Plan. The minimum staff required to conduct routine and immediate emergency mitigation is maintained on-shift 24-hours a day.

Figure 2.1 and Table 2.1 outline the minimum requirements for the PNPS on-shift and ERO staffing.

2.1.1 Control Room Supervisor/Emergency Director

The Control Room Supervisor position is staffed 24 hours a day. This position 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 shall not delegate the following responsibilities:

- Classification of an event
- Emergency notification approval (Task of making the notifications may be delegated)

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- Authorization of radiation exposures in excess of 10 CFR Part 20 limits.

Other Emergency Director responsibilities:

- Notification of the emergency classification to the NRC, State, and the Town of Plymouth
- Management of resources available to the facility
- Coordination of mitigative actions
- Coordination of corrective actions
- Coordination of onsite protective actions
- Decision to call for offsite assistance
- Coordination of Security activities
- Termination of the emergency condition when appropriate
- Performance of initial dose assessment
- Maintenance of records of event activities

2.1.2 Non-Certified Operator

The NCO, on shift 24 hours a day, performs system and component manipulations. The organizational relationship to the Control Room Supervisor/Emergency Director is the same during normal or emergency situations where the PDEP has been implemented.

2.1.3 Radiation Protection Technician

The Radiation Protection Technician, on shift 24 hours a day, is available to monitor personnel exposure, determine radiological conditions, and provide survey results, if necessary.

2.1.4 Security Force

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

2.2 Emergency Response Organization

The ERO shall be activated at the Alert classification. The ERO shall augment the on-shift staff within approximately 120 minutes of an Alert declaration. However, the ERO may be activated, in part or in whole, at any time at the discretion of the Control Room Supervisor/Emergency Director.

2.2.1 Technical Coordinator

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

The Technical Coordinator reports to the Emergency Director. The responsibilities of the Technical Coordinator when implementing the PDEP include:

- evaluating technical data pertinent to facility conditions,
- augmenting the emergency staff as deemed necessary,
- designating engineering support, as necessary, to evaluate facility conditions and provide technical support,
- recommending mitigation and corrective actions,
- coordinating search and rescue,
- coordinating maintenance and equipment restoration,
- establishing and maintaining communications as desired by the Emergency Director, and
- maintaining a record of event activities.

2.2.2 Radiation Protection Coordinator

The Radiation Protection Coordinator reports to the Emergency Director. The responsibilities of the Radiation Protection Coordinator when implementing the PDEP include:

- monitoring personnel accumulated dose,
- advising the Emergency Director concerning Radiological EALs
- augmenting the emergency staff as deemed necessary,
- directing radiological monitoring analysis,
- performing dose assessment,
- coordinating decontamination activities,
- establishing and maintaining communications as desired by the Emergency Director, and
- maintaining a record of event activities.

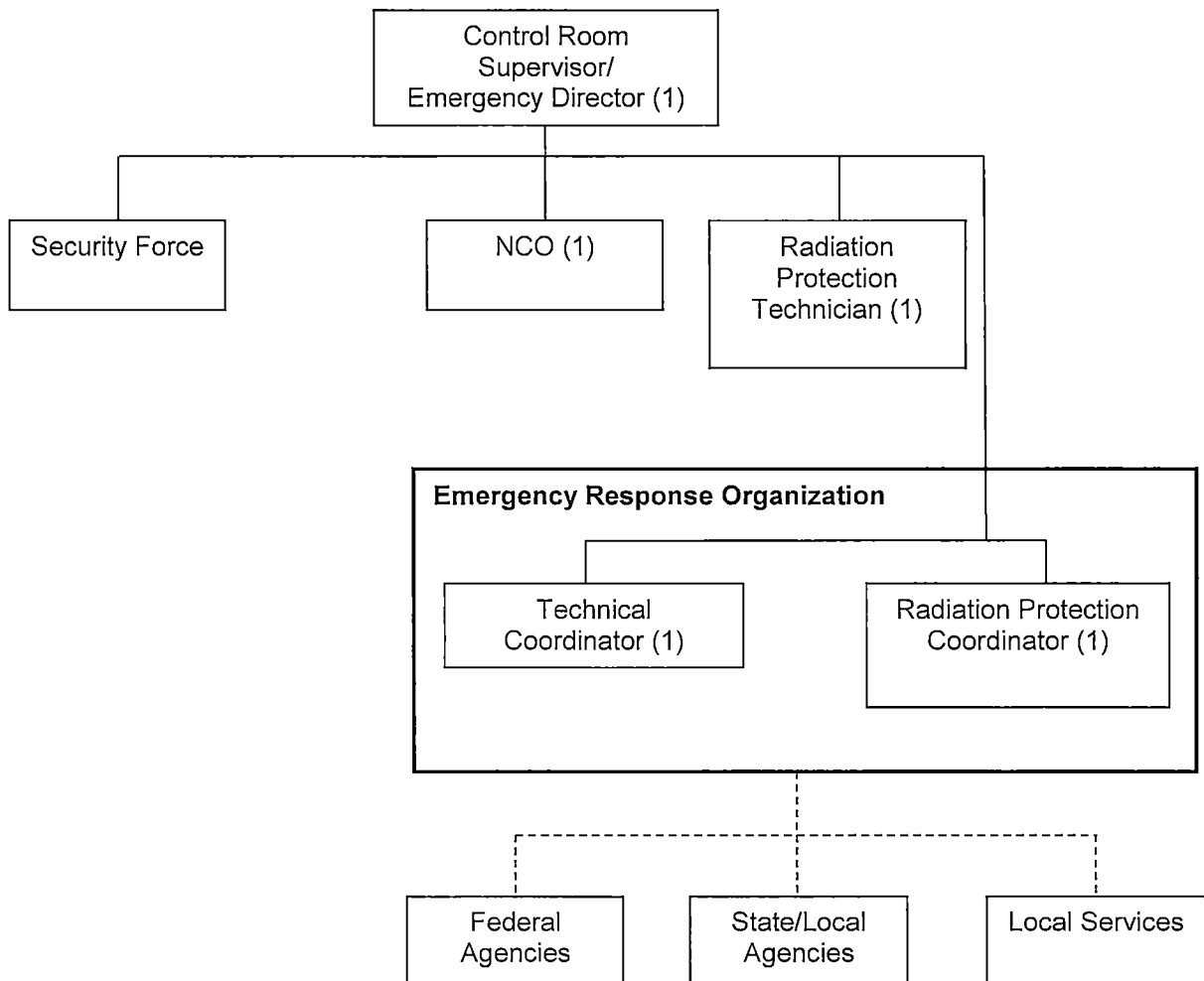
Table 2.1 provides a representation of the functional responsibilities of the on-shift and ERO positions that fulfill the emergency staffing requirements.

2.3 Offsite Organizations

Offsite organizations may respond to a declared emergency at PNPS. Each of these groups are capable of 24-hour response and operation. The details of their responsibilities are described in Section 3.0 of this Plan and are contained in their respective Letter of Agreement between each organization and PNPS.

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FIGURE 2.1
On-Shift and Emergency Response Organization



(#) Denotes number of staff (either on-shift or designated ERO)

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TABLE 2.1

On-Shift and Emergency Response Organization Staffing Requirements

MAJOR FUNCTIONAL AREA	LOCATION	PNPS STAFF	# ON-SHIFT	PNPS AUGMENTED CAPABILITY (120 MIN.)
Operations and assessment of Operational Aspects	Control Room/On-Scene	Non-Certified Operator*	1 ¹	-
Emergency Direction & Control	Control Room	Control Room Supervisor*	1 ¹	-
Notification/Communication	Control Room			-
Radiological Accident Assessment and Support of Operational Accident Assessment	As Directed by the Emergency Director	Radiation Protection Coordinator	-	1 (may augment with Radiation Monitoring personnel if necessary)
Protective Actions (In-Facility)	On-Scene	Radiation Protection Technician*	1	-
Condition Evaluation, Repair, and Corrective Action	As Directed by the Emergency Director	Technical Coordinator	-	1 (may augment with technical support and emergency repair personnel if necessary)
Firefighting	On-Scene	Per the Fire Protection Procedures		Offsite Response Organizations**
Rescue Operations/First Aid	On-Scene	***		
Site Access Control and Accountability	Per the Security Plan	Security Personnel	Per the Security Plan	-

¹ Technical Specifications allow the Technical Specification-required on-shift positions to be vacant for not more than 2 hours, in order to provide for unexpected absence, provided immediate action is taken to fill the required position.

* On-Shift personnel required to direct or perform site-specific mitigation strategies required for a catastrophic loss of SFP inventory.

** Response time is based on Fire Protection Procedures or response capability of the offsite response organization.

*** Provided by on-shift personnel assigned other functions.

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3.0 EMERGENCY RESPONSE SUPPORT AND RESOURCES

Radiological emergency preplanning is not required for the Commonwealth of Massachusetts, or the towns surrounding PNPS. State and local response to an emergency will be performed in accordance with each organization's plans and procedures and will be commensurate with the hazard posed by the emergency.

Letters of Agreement are in place for those local organizations that will provide ambulance services, treatment of contaminated and injured patients, fire support services, and law enforcement response as requested by PNPS. These letters are maintained on file in the Emergency Planning Department at PNPS. These agreements identify the emergency measures to be provided, the mutually accepted criteria for implementation, and the arrangements for exchange of information. Federal, Commonwealth, and local agencies that have response functions covered by laws, regulations, or executive orders have developed plans to meet these functions. These approved Plans serve as written agreements for agencies response to an incident at PNPS.

3.1 Support Provided by Local Organizations

3.1.1 Law Enforcement

The Plymouth Police Department has agreed to provide primary law enforcement as described in a separate agreement maintained by PNPS Security and Plymouth Police.

3.1.2 Fire and Rescue Support

The Plymouth Fire Department has agreed to provide the primary fire and rescue support services for PNPS.

3.1.3 Transportation of Injured and Contaminated Personnel

The Plymouth Fire Department has agreed to provide the primary coordination of emergency ambulance services including the transport of contaminated and injured personnel.

3.1.4 Treatment of Radioactively Contaminated and Injured Personnel

Beth Israel Deaconess Hospital - Plymouth has agreed to provide medical treatment to contaminated and injured personnel.

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4.0 EMERGENCY CLASSIFICATION SYSTEM

This section describes the emergency classification scheme used to determine the minimum response to an abnormal event at PNPS.

4.1 Classification of Emergencies

The emergency classification system covers the entire spectrum of possible radiological and non-radiological emergencies at PNPS. The emergency classification system categorizes accidents and/or emergency situations into two emergency classification levels depending on emergency conditions at the time of the incident. The emergency classification levels applicable to PNPS, in order of increasing severity are Unusual Event and Alert. Each of these emergency classes requires notification of the Commonwealth of Massachusetts and Town of Plymouth authorities, and the Nuclear Regulatory Commission (NRC). The ERO will be notified at an Alert declaration.

PNPS's permanently defueled emergency classification system is developed consistent with NEI-99-01, "Development of EALs for Non-Passive Reactors," Revision 6. Appendix C of NEI 99-01, Revision 6, contains a set of Initiating Conditions (ICs)/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, Revision 6, has been endorsed by the NRC and provides a standard method for classifying emergencies.

When indications are available to on-shift personnel that an EAL has been met, the event is assessed and the corresponding emergency classification level is declared. PNPS maintains the capability to assess, classify, and declare an emergency condition within 30 minutes after the availability of indications that an EAL threshold has been reached.

Incidents may be classified in a lower emergency classification level first, and then upgraded to the higher level if the situation deteriorates.

The following subsections outline the facility actions at each emergency classification level. Refer to the Permanently Defueled Emergency Action Level Technical Bases for actual parameter values, annunciators, and equipment status used by PNPS personnel to classify emergencies.

4.1.1 Unusual Event

Unusual Event conditions do not cause serious damage to the facility. The purpose of the Unusual Event declaration is to: 1) bring the ERO to a state of readiness; 2) make required and needed notifications; 3) provide for systematic handling of information and decision-making; and 4) augment shift personnel if necessary.

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4.1.2 Alert

The purpose of the Alert declaration is to: 1) activate the ERO; 2) make required and needed initial notifications as well as updates to event conditions; and 3) ensure all necessary resources are being applied to accident mitigation.

The Alert status shall be maintained until termination of the event occurs. Recovery operations may be entered without termination. Offsite authorities will be informed of the change in the emergency status and the necessary documentation shall be completed as specified in the EIPs.

4.2 Postulated Accidents

The Defueled Safety Analysis Report (DSAR) describes the postulated accidents applicable to PNPS. Methods for detecting and evaluating these events include the use of installed systems, instrumentation, alarms, approved procedures, as well as field observation.

4.3 Emergency Classification System Review

The emergency classification system and the EALs are reviewed with the Commonwealth of Massachusetts and the Town of Plymouth authorities on an annual basis.

5.0 NOTIFICATION METHODS AND PROCEDURES

The decision to make notifications is based on the EALs and corresponding emergency classifications described in Section 4.0 of this Plan. PNPS is capable of notifying and activating its Emergency Response Organization 24 hours per day. It is also able to make notifications to the Commonwealth of Massachusetts and the Town of Plymouth, and the NRC on a 24 hour per day basis

5.1 Notification and Activation

The Control Room Supervisor is responsible for the initial declaration and then assumes the duties of the Emergency Director. The authority and responsibility for classifying and declaring emergencies, initiating notification to the Commonwealth, Town of Plymouth, and Federal officials, and initiating corrective and mitigative actions resides with the Emergency Director position.

PNPS personnel in the Protected Area are notified by announcements made from the Control Room over the plant public address system, office telephones, and/or wireless devices capable of receiving telephone calls and text messages. If required, personnel outside the Protected Area are notified by public address systems installed in the buildings outside the Protected Area. Site Security personnel may assist in the notification of all other personnel on PNPS property.

5.1.1 Emergency Response Organization Activation

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On-site staff are informed of an emergency condition through the use of the facility public address system, office telephone, and/or wireless devices capable of receiving telephone calls and text messages. In the event that personnel required to staff ERO positions are not on-site at the time an emergency is declared, they may be contacted by commercial telephone including land lines and/or wireless devices capable of receiving telephone calls and text messages. Mobilization of the ERO will be conducted under the direction of the Emergency Director, according to personnel assignments and telephone numbers maintained in various telephone directories.

5.1.2 Commonwealth and Local Government Notification

Notification to the responsible Commonwealth and Town of Plymouth authorities is required within 60 minutes of the emergency classification. The commercial telephone network serves as the primary means to provide emergency notification to Commonwealth and Town of Plymouth agencies. It is used to provide initial and updated notifications and for general information flow between these agencies.

PNPS, in coordination with the Commonwealth of Massachusetts, have established the contents of the initial emergency messages to be sent from PNPS in the event an emergency is declared. These messages contain the following information if it is known and appropriate:

- Notification Type, i.e. "This is a Drill" or "This is an Actual Event."
- Identity of caller and receiver of call
- The date and time of classification and notification
- Emergency classification
- EAL identification and whether a release is in progress
- Wind direction and speed
- Response actions underway
- Prognosis for worsening or termination of event based on facility information

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.

Follow-up emergency messages incorporate elements as determined necessary by the Commonwealth of Massachusetts. These messages are transmitted by telephone or facsimile. Updated messages are sent at least every 60 minutes. The frequency of updates may be modified during ongoing events if requested by the Commonwealth of Massachusetts and the status of the event has not changed.

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5.1.3 NRC Event Notification System

The NRC Emergency Notification System (ENS) is a dedicated telephone system used to notify the NRC Operations Center of an emergency. The NRC will be notified as soon as possible after Commonwealth/Town of Plymouth notifications and within 60 minutes of event classification or change in classification. In the event that the ENS fails, commercial phone lines will be used to notify the NRC. Notification to the NRC is the responsibility of the Emergency Director.

6.0 EMERGENCY COMMUNICATIONS

A number of communications systems are available for use among the principal response organizations. Provisions for 24-hour per day notification to Commonwealth and Town of Plymouth authorities is discussed in Section 5.0 of this plan. Provisions for activating PNPS ERO personnel are also discussed in Section 5.0 of this plan. Provisions for periodic testing of the emergency communications system are described in Section 14.0 of this plan.

6.1 Communications Systems

Several modes of communication are available to facility staff to transmit information onsite and offsite during normal and emergency situations.

6.1.1 PNPS Paging System

The onsite paging system (Gaitronics) provides a means of intra-plant communications. Stations on this system provide access to the paging system and to intercom lines. These stations and speakers are placed throughout the facility including the Control Room. The Gaitronics Page System provides five Station channels, one of which is dedicated to operations/emergency use only.

For all emergency classifications, all personnel within the Protected Area are notified of the declaration, escalation or termination of an emergency by alarms and verbal announcements over this system. Announcements include the emergency classification and response actions to be taken by site personnel.

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6.1.2 Telephone System

The commercial telephone system (see Section 5.1.2) is the primary emergency notification system between PNPS, the Commonwealth, and the Town of Plymouth and is used to provide initial and follow-up notifications and for general information flow between these agencies.

Additional methods of communication are available to facility staff to transmit information onsite and offsite during normal and emergency situations.

The telephone system can be used for in-facility as well as outside communications. The telephone system is the primary means to activate the ERO upon declaration of an emergency, as directed by the Emergency Director. In the event that personnel required to staff emergency positions are not on-site at the time an emergency is declared, they may be contacted by commercial telephone including land lines and/or wireless devices capable of receiving telephone calls and text messages. Telephone numbers are maintained in various telephone directories.

The phone system includes many automated or programmable features that improve notification and allow flexibility. Wireless communications serve as the backup means of communication.

6.1.3 Federal Telecommunications System

The NRC ENS utilizes the Federal Telecommunications System (FTS) telephone network for emergency communications. The FTS line exists between the NRC Operations Office in Rockville, Maryland and the PNPS Control Room. Emergency notification, facility status information, and radiological information are communicated via the ENS.

6.1.4 Portable Radios

Portable radios may be utilized by facility personnel and ERO personnel during an emergency.

6.2 Communications with Medical Support Facilities

PNPS establishes communications with Beth Israel Deaconess Hospital – Plymouth via commercial telephone which is accessed by Station personnel either via commercial onsite telephone or by a PNPS telephone. A direct, dedicated ring-down telephone into the Plymouth Fire Department (the ambulance Dispatcher) provides for a coordinated communications link to the ambulances responding to PNPS or transporting personnel from the from PNPS.

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7.0 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 via the ERO notification system 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 on 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 PNPS.

Federal, State and local emergency response organizations maintain the capability to disseminate appropriate information regarding an emergency at PNPS.

As part of its normal corporate structure, Entergy maintains a corporate public affairs office that can be called upon to provide resources, as necessary.

8.0 EMERGENCY FACILITIES AND EQUIPMENT

Following the declaration of an emergency, the activities of the ERO are coordinated from the Control Room. Adequate emergency facilities and equipment to support emergency response are provided and maintained.

8.1 Control Room

The Control Room is located on the 37' elevation of the Turbine Building. During a declared emergency, command and control is maintained in the Control Room. Facility personnel assess conditions; evaluate the magnitude and potential consequences of abnormal conditions; initiate preventative, mitigating and corrective actions; and perform onsite and offsite notifications. When activated, the ERO reports to the Control Room.

8.2 Laboratory Facilities

A laboratory for radioisotopic analysis and non-radiological chemical analysis is available at PNPS. If the PNPS radiochemistry laboratory is not functional, PNPS has access to outside analytical assistance and laboratory facilities from other non-affected Entergy nuclear sites, Commonwealth, and Federal agencies.

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8.3 Emergency Equipment

PNPS 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 facility processes, radiological conditions, meteorological conditions, and fire hazards.

Emergency kits are described in Section 8.4.

8.3.1 Process Monitors

Annunciator and computer alarms are provided for a variety of parameters including the SFP and the SFP systems to indicate SFP level and temperature. The manner in which process monitors are used for accident recognition and classification is detailed in PNPS's Permanently Defueled EALs.

8.3.2 Radiological Monitors

Radiation monitors and monitoring systems provide continuous radiological surveillance. These monitors, which include Control Room readout and alarm functions, exist in order that appropriate action can be initiated to limit fuel damage and/or contain radioactive material. The system performs the following basic functions:

- Warns personnel of potential radiological health hazards
- Gives early warning of certain equipment malfunctions that might lead to a radiological hazard or facility damage
- Prevents or minimizes the effects of inadvertent releases of radioactivity

Plant instrumentation provides Control Room personnel with the following parameters necessary to perform dose assessment and determine the magnitude of a potential release:

- Gaseous and liquid effluent monitor readings
- Area radiation levels

In addition to installed monitoring systems, onsite portable radiation and contamination monitoring equipment is available.

8.3.3 Meteorological Monitoring

Meteorological data is available in the Control Room. The data are used to determine the projected radiological consequences in the event of an accidental release of radioactivity to the environment.

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In addition, the National Weather Service operates on a twenty-four (24) hour per day basis. Upon request, this organization can provide PNPS with meteorological conditions including predicted temperature inversions, precipitation, wind patterns, and velocity.

8.3.4 Fire Detection and Suppression Equipment

PNPS has installed fire and combustion detection equipment at PNPS in compliance with the Station Fire Plan.

8.4 Emergency Kits

Emergency kits and equipment are maintained to support an emergency response.

8.4.1 Radiological Emergency Kits

Radiological Emergency kits include protective equipment, radiological monitoring equipment and emergency supplies. Kits are located in the Control Room. The methods and frequencies for instrument calibration, repair, and replacement are maintained in accordance with facility procedures.

8.4.2 Dosimetry Kits

Dosimetry kits include dosimetry, dosimeter chargers, and appropriate paperwork. Kits are located in the Control Room.

8.4.3 Medical Kits

Portable first-aid kits are available in the Engineering and Support Building 1st Floor entrance closest to Primary Access Point in the Medical Cart, Medical Office in the vestibule Central Alarm Station Building, and Old Executive Building within the Fire Tour personnel area. These kits are inspected and maintained in accordance with approved facility procedures.

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9.0 ACCIDENT ASSESSMENT

The activation of the PDEP and the continued assessment of accident conditions requires monitoring and assessment capabilities. PNPS 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.

9.1 Radiological Assessment

9.1.1 Initial Assessment

PNPS has Area Radiation Monitors (ARM) for the direct measurement of in-plant exposure rates and Process Radiation Monitors (PRM) for the measurement of noble gas in plant effluents. The ARM readings allow in-plant exposure rate determinations to be made remotely without requiring local hand-held meter surveys. This information may be used, initially, to aid in the determination of plant area accessibility. The Process Radiation Monitors provide an immediate indication of a radiological release of effluents.

Classification of an emergency is performed by the Emergency Director in accordance with the Permanently Defueled EAL Scheme.

9.1.2 Initial Dose Assessment

Initial dose assessment is performed by qualified on-shift personnel, under the direction of the Emergency Director. When the ERO is augmented, the Radiation Protection Coordinator assumes subsequent dose assessment responsibilities.

9.2 Corrective Actions

Station procedures and EIPs provide preventative and/or corrective actions that mitigate the consequences of events. Instrumentation, control systems, and radiation monitoring systems provide indications related to the safe and orderly implementation of corrective actions. These systems provide indication of SFP storage inventory, temperature, cooling, and supporting systems.

PNPS maintains procedures and strategies for the movement of any necessary portable equipment that will be relied upon for mitigating the loss of SFP water. Events involving a loss of SFP cooling and/or water inventory can be addressed by implementation of SFP inventory makeup strategies required under 10 CFR 50.54(hh)(2). These capabilities are maintained as a license condition and in accordance Technical Specifications. These diverse strategies provide defense-in-depth and ample time to provide makeup water or spray to the SFP prior to the onset of zirconium cladding ignition when considering very low probability beyond design basis events affecting the SFP.

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9.3 Dose Assessment

EIPs utilize radiological instrumentation readings and meteorological data to provide a rapid method of determining the magnitude of a radioactive release during an emergency. PNPS is capable of performing dose assessment 24 hours a day. Dose assessment is the responsibility of the Emergency Director. When augmented, the Radiation Protection Coordinator assumes the dose assessment responsibilities.

10.0 PROTECTIVE ACTIONS

Protective actions for personnel at the facility are provided for their health and safety. Implementation guidelines for protective actions are provided in the EIPs. Facility procedures also provide protective actions to protect personnel during hostile actions.

It is the policy of PNPS to keep personnel radiation exposure within federal regulations, and station limits and guidelines and to keep exposures As Low As Reasonably Achievable (ALARA). Every effort will be made to keep exposures for those providing emergency functions within the limits of 10 CFR Part 20.

10.1 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 making announcements over the Gaitronics Page 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. In these cases, accountability will be completed once safe conditions have been established.

10.2 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.

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11.0 RADIOLOGICAL EXPOSURE CONTROL

During a plant emergency, abnormally high levels of radiation and/or radioactivity may be encountered by plant 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.

11.1 Radiological Control Areas

The Radiation Protection Coordinator will ensure Radiological Control Areas (RCAs) are established in response to the event. The Radiation Protection Coordinator shall direct control of access to all RCAs unless immediate access control is authorized by the Emergency Director to protect personnel or facilitate emergency repairs.

11.2 Exposure Control

Individuals authorized to enter RCAs are required to have dosimetry capable of measuring a dose received from external sources of ionizing radiation. Emergency workers are issued permanent reading dosimeters (e.g., Dosimeter of Legal Record (DLR)) as a means of recording radiation exposure for permanent records prior to entering a RCA. Additionally, personnel are issued electronic alarming dosimetry capable of measuring dose and dose rate on a real time basis. These dosimeters indicate dose on a digital display and are programmed to provide an audible alarm at a pre-determined dose or dose rate limit. Dose records are maintained in accordance with facility procedures. Emergency workers are instructed to read self-indicating dosimeters frequently, and DLRs may be processed with increased periodicity during a response to an emergency. The capability exists for the emergency processing of DLRs on a 24-hour per day basis.

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, corrective actions, and assessment actions within applicable limits specified in 10 CFR Part 20.

The Emergency Director is responsible for authorizing personnel to receive doses in excess of 10 CFR Part 20 limits, if necessary. This authorization is coordinated with the Radiation Protection Coordinator when available. Table 11.1 contains the guidelines for emergency exposure criteria, which is consistent with Table 3-1, "Emergency Worker Guidelines," provided in the EPA PAG Manual.

Dosimeters and DLRs are typically located in each of the emergency lockers in the Control Room. Additional dosimeters and DLRs are available.

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11.3 Personnel Contamination Control and Decontamination Capability

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

Decontamination materials are stored in Assembly Areas.

Contamination control measures are maintained to address access control, drinking water and food supplies, and the return of areas and items to normal use in accordance with proper radiation and contamination control techniques. Documentation surveys and decontamination activities shall be maintained in accordance with facility procedures.

PNPS procedures establish requirements and specific action levels for decontamination of personnel, equipment, and areas, and for the release of the affected personnel, equipment, and areas from radiological controls. If actual or potential contamination problems exist onsite, the Emergency Director may elect to establish contamination control and monitoring measures. These measures may consist of the establishment of contamination control boundaries to minimize the spread of contamination and monitoring of personnel evacuating the affected area using installed monitors or personnel with portable equipment.

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. Tools, equipment, and areas that become contaminated will be decontaminated as determined by Radiation Protection personnel.

If personnel decontamination becomes necessary, decontamination is performed under the direction of the Radiation Protection Coordinator. Contaminated personnel that are evacuated will be decontaminated as determined by Radiation Protection personnel. If the contaminated individual has an injury involving contamination, efforts to decontaminate the injured person to reasonable levels are made prior to transfer to offsite medical facilities. If decontamination is not practical, the injured person is covered in such a manner as to minimize the spread of contamination until either medical aid can be obtained or until the injured person can be transported to Beth Israel Deaconess Hospital - Plymouth. Radioactive waste is controlled to ensure that the contents are monitored and processed, if necessary.

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Priorities for decontaminating tools, equipment, and areas will be established by the Emergency Director, with top priority given to contamination within areas that are or will be inhabited by emergency workers. Decontamination of non-essential areas, tools, and equipment should be delayed to allow for natural decay of radioactive materials.

Protective clothing is maintained in the Control Room. Additional sets are available.

Monitoring and issue of respiratory protection equipment will be conducted in accordance with facility procedures.

TABLE 11.1
EMERGENCY EXPOSURE CRITERIA
(Refer to Note 1)

Guideline	Activity	Condition
5 rem	All occupational exposures	All reasonably achievable actions have been taken to minimize dose.
10 rem ^(a)	Protecting critical infrastructure necessary for public welfare	Exceeding 5 rem is unavoidable and all appropriate actions have been taken to reduce dose. Monitoring available to project or measure dose.
25 rem ^{(b)(c)}	Lifesaving or Protection of Large Population	Exceeding 5 rem is unavoidable and all appropriate actions have been taken to reduce dose. Monitoring available to project or measure dose.

NOTES:

1. Reference for this table is Table 3-1 of the EPA PAG Manual.
- (a) For potential doses > 5 rem, medical monitoring programs should be considered.
- (b) In the case of a very large incident, consider the need to raise the property and lifesaving Response Worker Guideline to prevent further loss.
- (c) Only on a voluntary basis. Response actions that could cause exposures in excess of 25 rem should only be undertaken with an understanding of the potential acute effects of radiation to the exposed responder and only when the benefits of the action clearly exceed the associated risks.

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12.0 MEDICAL AND HEALTH SUPPORT

PNPS maintains on-shift personnel and equipment to provide first aid for personnel working at the site. Medical supplies for emergency first aid treatment are provided on the site at various locations.

If immediate professional medical help is needed, local ambulance services are available to transport seriously ill, injured, or radioactively contaminated injured personnel. PNPS is capable of maintaining communications with medical support facilities and the local ambulance service while transporting a patient. These capabilities are described in Section 6.2.

An agreement is in place with Beth Israel Deaconess Hospital - Plymouth for medical treatment of patients from PNPS who have injuries complicated by radioactive contamination. The hospital has trained personnel and detailed procedures for handling radioactively contaminated patients from PNPS.

13.0 RECOVERY

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 plant personnel. Planning for the recovery involves the development of general principles and an organizational capability that can be adapted to any emergency situation. Upon termination of an emergency and transition to recovery phase, the Emergency Director assembles the recovery organization to address the specific emergency circumstances of the terminated event.

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

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

The remainder of the recovery is accomplished using the normal facility and emergency organizations as necessary to provide radiological and technical expertise to the Emergency Director in order to restore the facility to normal conditions.

The recovery organization's responsibilities include:

- Maintaining comprehensive radiological surveillance of the facility to assure continuous control and recognition of problems
- Controlling access to the area and exposure to workers
- Decontaminating affected areas and/or equipment
- Conducting clean-up and restoration activities
- Isolating and repairing damaged systems

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- Documenting all proceedings of the event and reviewing the effectiveness of the emergency organization in reducing public hazard and plant damage

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

14.0 EXERCISES AND DRILLS

Periodic exercises are conducted to evaluate major portions of emergency response capabilities. Periodic drills are conducted to develop and maintain key emergency response skills. Deficiencies as a result of exercises or drills are identified and corrected.

14.1 Exercises

Biennial exercises shall be conducted to test the timing and content of implementing procedures and methods and to ensure that emergency personnel are familiar with their duties. Offsite organizations are offered the opportunity to participate to the extent assistance would be expected during an emergency declaration. However, participation by offsite organizations is not required, nor are offsite response organizations evaluated.

14.2 Drills

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

14.2.1 Medical Drills

Medical emergency drills, involving an individual who is simulated to be injured and contaminated, are conducted at least annually. The local ambulance service and Beth Israel Deaconess Hospital - Plymouth are invited to participate in an annual exercise and/or scheduled drill(s) to demonstrate and practice the receipt and treatment of contaminated patients. Involvement by hospital and medical transport services may be included as part of any drill or exercise.

14.2.2 Accountability Drills

An accountability drill shall be conducted annually. This drill shall include identifying the locations of all personnel onsite. This drill can be performed as part of any drill or exercise.

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14.2.3 Health Physics Drills

At least semi-annually, drills are conducted which involve response to, and analysis of, simulated in-facility airborne and liquid samples with elevated levels of activity. These drills also involve direct measurements of radiation levels in the facility. Normal facility health physics rules and procedures are followed. This drill can be performed as part of any drill or exercise.

14.2.4 Augmentation Capability Drills

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

14.2.5 Fire and Security Drills

Fire Drills and Security Drills are conducted in accordance with the respective PNPS plans and procedures.

14.2.6 Communication Tests

- A. The ENS used to communicate with the NRC is tested monthly.
- B. To ensure the reliability of the plant's call-in procedure, a semi-annual functional test of the ERO notification system is performed to test system performance. This can be performed separately or during the Augmentation Capability Drill described in Section 14.2.4.
- C. The following communication systems, as detailed in Section 6.2, are used on a frequent basis. Therefore, periodic testing of these systems is not necessary:
 - a. PNPS Paging System
 - b. Commercial Telephone System
 - c. Portable Radios

14.3 Scenarios

An Exercise/Drill Coordinator is responsible for the overall development of the scenario package.

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

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- Objective(s)
- Date, time period, place and participating organizations
- Simulation lists
- Timeline of real and simulated events
- A narrative summary
- List of controllers and participants

The final scenario shall be approved by a designated member of senior facility management. Drill/Exercise confidentiality must always be maintained.

14.4 Critique/Evaluation

Critiques will evaluate the participant's performance during a drill or exercise. The ability of participants to self-evaluate weaknesses and identify areas of improvement is the key to successful exercise/drill conduct.

Exercise and drill performance objectives are evaluated against measurable demonstration criteria. As soon as possible following the conclusion of each drill/exercise, a critique, including participants, controllers, and evaluators, is conducted to evaluate the ability of the participants to meet the performance objectives. Deficiencies are identified and entered into the corrective action system.

A written report is prepared including the evaluation of designated objectives. The report evaluates and documents the participants' response to the emergency situation. The report will also contain reference to corrective action and recommendations resulting from the drill/exercise.

15.0 RADIOLOGICAL EMERGENCY RESPONSE TRAINING

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

15.1 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.

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

15.1.1 Emergency Response Organization Training

Control Room Supervisors/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, Commonwealth, and local notification procedures
- ERO Augmentation
- Emergency Exposure Control
- Mitigating strategies for a catastrophic loss of spent fuel pool inventory
- Recovery

PNPS 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.

15.1.2 General Employee Training

GET provides initial training and annual requalification training on the basic elements of the PNPS Emergency Plan for all personnel working at PNPS. These elements include:

- Station emergency alarms and their meaning
- Assembly areas
- Site evacuation procedure
- Special precautions and limitations during an emergency
- Purpose of the PNPS Emergency Plan
- Role of the worker during an emergency
- Related industry events

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15.1.3 Local Support Service Personnel Training

Training is offered annually to offsite organizations which may provide specialized services during an emergency at PNPS (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 and orientation, basic radiation protection, and interface activities are included in the training.

15.1.4 First Aid Training

On-shift Emergency Medical Personnel (individuals qualified as EMTs; RNs, First Responders, and Paramedics) are trained to respond to medical emergencies per PNPS procedure 5.5.3, Medical Emergency Response Procedure.

15.2 Documentation of Training

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

16.0 RESPONSIBILITY FOR THE PLANNING EFFORT: PERIODIC REVIEW AND DISTRIBUTION OF EMERGENCY PLANS

Senior plant leadership is responsible for the implementation of actions required to periodically exercise the PDEP and the EIPs and for maintaining an effective ERO staff.

Senior plant leadership is responsible for the final approval of PDEP and the EIPs used for emergency classification, and for maintaining an effective emergency response capability at PNPS.

The Manager, Emergency Planning, is responsible for the development, administration and maintenance of the PDEP, EIPs, review and approval of all EIP changes, planner training, the overall development and implementation of the PNPS ERO Training and Qualification Program and coordination of emergency planning activities with off-site emergency organizations.

16.1 Document Maintenance

16.1.1 Review and Update of the PDEP and EIPs

The PNPS PDEP, Permanently Defueled EAL Technical Bases, and the EIPs included in Appendix A are reviewed annually and updated as needed. All proposed changes will be reviewed in accordance with 10 CFR 50.54(q) to ensure that the change would not compromise the effectiveness of any other EIP or degrade the effectiveness of the PDEP. The Manager, Emergency Planning, is responsible for forwarding

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approved changes to the plan to appropriate organizations and individuals with responsibility for implementation of the plan.

16.1.2 Emergency Planning Documents

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

The emergency classification system and the EALs are reviewed with the Commonwealth of Massachusetts and the Town of Plymouth on an annual basis.

The PNPS emergency telephone directory will be maintained in specified locations and is reviewed and updated quarterly.

16.2 Inventory and Maintenance of Emergency Equipment

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.

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

APPENDIX A

EMERGENCY PLAN IMPLEMENTING PROCEDURES

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

APPENDIX A

EMERGENCY PLAN IMPLEMENTING PROCEDURES

Document Number	Document Title
TBD	PERMANENTLY DEFUELED EMERGENCY ACTION LEVELS
TBD	ASSESSMENT OF EMERGENCIES
TBD	EMERGENCY CLASSIFICATION
TBD	EMERGENCY RESPONSE ORGANIZATION ACTIVATION AND OPERATION
TBD	CONTROL ROOM OPERATIONS
TBD	PERSONNEL PROTECTIVE ACTIONS
TBD	NOTIFICATIONS
TBD	TERMINATION AND RECOVERY

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

APPENDIX B

**CROSS-REFERENCE BETWEEN THE PDEP,
NUREG-0654/FEMA-REP-1, 10 CFR 50.47(b)
PLANNING STANDARDS, AND APPENDIX E.IV
PLANNING REQUIREMENTS**

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

APPENDIX B

CROSS-REFERENCE BETWEEN THE PDEP, NUREG-0654/FEMA-REP-1, 10 CFR 50.47(b) PLANNING STANDARDS, AND APPENDIX E.IV PLANNING REQUIREMENTS

NUREG-0654, Section II Evaluation Criteria	Planning Standard (10CFR50.47)**	Planning Requirement (Appendix E.IV)**	PNPS PDEP Section
A	(b)(1)	A.1,2,4,7	2.0
B	(b)(2)	A.1,2,4,9; C.1	2.0
C	(b)(3)	A.6,7	3.0
D	(b)(4)	B.1,2;C.1,2	4.0
E	(b)(5)	A.6,7;C.1,2;D.1,3;E	5.0
F	(b)(6)	C.1;D.1,3;E	6.0
G	(b)(7)	A.7;D.2	7.0
H	(b)(8)	E;G	8.0
I	(b)(9)	A.4;B.1;C.2;E	9.0
J	(b)(10)	C.1;E;I	10.0
K	(b)(11)	E	11.0
L	(b)(12)	A.6,7;E	12.0
M	(b)(13)	H	13.0
N	(b)(14)	E9;F	14.0
O	(b)(15)	F	15.0
P	(b)(16)	G	16.0

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

APPENDIX C

DEFINITIONS AND ACRONYMS

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

1.0 DEFINITIONS

Accountability – The process of determining the location of onsite personnel in order to identify missing and or injured personnel.

Alert – Events are in progress or have occurred which involve a potential or actual substantial degradation of 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.

Annual – Frequency of occurrence equal to once per calendar year, January 1 to December 31, unless otherwise specified.

Assessment Actions – Those actions taken during or after an incident to obtain or process information necessary for decisions in specific emergency measures.

Corrective Actions – Those emergency measures taken to mitigate or terminate an emergency situation at or near the source of the problem in order to reduce the magnitude.

Emergency Action Levels – Predetermined, site specific, observable threshold for an Initiating Condition (IC) that, when met or exceeded, places the facility in a given emergency classification.

Emergency Classification – Names set forth by the Nuclear Regulatory Commission (NRC) for grouping off-normal events or conditions according to potential effects or consequences. In order of severity: Unusual Event (UE) and Alert.

Emergency Plan Implementing Procedures – The procedures which detail the specific course of action for implementing the emergency plan at PNPS.

Emergency Response Organization – The organizational structure of assigned PNPS personnel responsible for coordinating response and recovery from emergency conditions at the facility.

Exclusion Area – The property of PNPS surrounding the Protected Area in which the licensee has the authority to determine all activities including exclusion or removal of personnel and property from the area.

Hostile Action – An act toward a facility 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, but is not necessarily limited to, attack by air, land, or water using guns, explosives, projectiles, vehicles or 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 are not part of a concerted attack on the facility. Violent acts between individuals in the owner controlled area do not meet this definition.

Independent Spent Fuel Storage Installation - A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

Initiating Condition – An event or condition that aligns with the definition of one of the two emergency classification levels by virtue of the potential or actual effects or consequences.

Monthly – Frequency of occurrence equal to once per calendar month.

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.

Onsite – The area within the Exclusion Area Boundary.

Projected Dose – The estimated radiation dose that would be received by individuals following a release of radiation.

Protected Area – The area normally within the facility security fence designated to implement the security requirements of 10 CFR 73.

Protective Actions – 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.

Radiological Control Area – An area in which radioactive material is present and the potential exists for the spread of radioactive contamination. The area will be posted for purposes of protecting individuals against undue risks from exposure to radiation and radioactive materials.

Recovery – Actions taken after the emergency has been controlled to restore the facility as nearly as possible to its pre-emergency condition.

Site Evacuation – Removal of all personnel, except essential PNPS personnel from the Exclusion Area and PNPS Protected Area.

PNPS PERMANENTLY DEFUELED EMERGENCY PLAN

2.0 ACRONYMS

CFR	Code of Federal Regulation
DLR	Dosimeter of Legal Record
EAL	Emergency Action Level
ENS	Emergency Notification System
EPA	Environmental Protection Agency
EPIP	Emergency Plan Implementing Procedure
ERO	Emergency Response Organization
FTS	Federal Telecommunications System
IC	Initiating Condition
ISFSI	Independent Spent Fuel Storage Installation
NCO	Non-Certified Operator
NOUE	Notification of Unusual Event
NRC	U.S. Nuclear Regulatory Commission
NWS	National Weather Service
PAG	Protective Action Guide
PDEP	Permanently Defueled Emergency Plan
PNPS	Pilgrim Nuclear Power Station
RCA	Radiological Control Area
SFP	Spent Fuel Pool

Enclosure 2

Letter Number 2.18.035

Permanently Defueled Emergency Action Level Technical Bases Document

(42 pages follow)

PILGRIM NUCLEAR POWER STATION

PERMANENTLY DEFUELED EMERGENCY ACTION LEVEL TECHNICAL BASES

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1.0 PURPOSE

This document provides the detailed set of Emergency Action Levels (EALs) applicable to the Pilgrim Nuclear Power Station (PNPS) 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, Rev. 6). As a Permanently Defueled Station, PNPS will use the Recognition Category "PD" (Permanently Defueled) providing a stand-alone set of ICs/EALS for a permanently defueled nuclear power plant to consider for use in developing a site-specific emergency classification scheme. (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 PNPS EALs, provide historical documentation for future reference and serve as a resource for training. Decision-makers responsible for implementation of AP-3125, Emergency Plan Classification and Action Level Scheme, may use this document as a technical reference in support of EAL interpretation.

The expectation is that emergency classifications are to be made as soon as conditions are present and recognizable for the classification, but within 60 minutes or less in all cases of conditions present. 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 provides guidance for an emergency classification scheme applicable to a permanently defueled station. This is a station 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 this type of station 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 Initiating Conditions (ICs) and Emergency Action Levels (EALs) applicable to

a permanently defueled station may result in either a Notification of Unusual Event (Unusual Event) or Alert classification.

2.2 Independent Spent Fuel Storage Installation

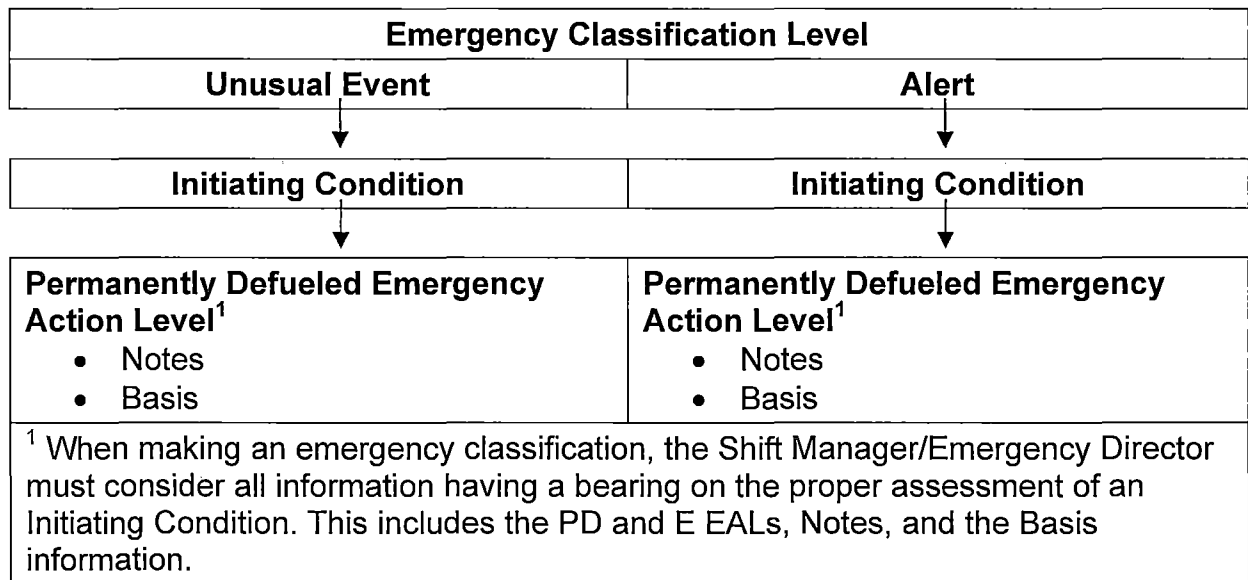
Selected guidance in NEI 99-01, Rev. 6 is applicable to licensees electing to use their 10 CFR Part 50 emergency plan to fulfill the requirements of 10 CFR 72.32 for a stand-alone Independent Spent Fuel Storage Installation (ISFSI). The emergency classification levels applicable to an ISFSI are consistent 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) 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 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 than that prescribed for a 10 CFR 50.47 emergency plan (e.g., no emergency technical support function).

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. As an aid to the reader, the following table is provided as an overview to illustrate the relationship of the terms to each other.



3.1 Emergency Classification Levels

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 emergency classification levels, in ascending order of severity, are:

- Unusual Event
- Alert

3.1.1 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.

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 U.S. Environmental Protection Agency (EPA) Protective Action Guide (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

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

Discussion: An Initiating Condition (IC) describes an event or condition, the severity or consequences of which meets the definition of an emergency classification level. 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 Initiating Conditions (i.e., facility conditions that indicate that a radiological emergency, or events that could lead to a radiological emergency, has occurred). NUREG-0654 states that the Initiating Conditions 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

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

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 facility 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 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 PDHA3). The Emergency Director will need to determine if the effects or consequences of the event or condition reasonably meet or exceed a particular emergency classification level 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 notification 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 Alert EALs are met, an Alert 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 IMMIDENT). If, in the judgment of the Emergency Director, meeting an EAL is IMMIDENT, the emergency classification should be made as if the EAL has been met. While applicable to all emergency classification levels, this approach is particularly important at the higher emergency classification level since it provides additional time for implementation of protective measures.

4.5 Emergency Classification Level Upgrading and Termination

An emergency classification level may be terminated when the event or condition that meets the IC and EAL no longer exists.

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 emergency classification level must be declared regardless of its continued presence at the time of declaration. Examples of such events would be an earthquake or an explosion.

4.7 Classification of Transient Conditions

Many of the ICs and/or EALs contained in this document employ time-based criteria. These criteria will require that the IC/EAL conditions be present for a defined period of time before an emergency declaration is warranted. In cases where no time-based criterion is specified, it is recognized that some transient conditions may cause an EAL to be met for a brief period of time (e.g., a few seconds to a few minutes). The following guidance should be applied to the classification of these conditions.

EAL momentarily met during expected facility response - In instances where an EAL is briefly met during an expected (normal) facility response, an emergency declaration is not warranted provided that associated systems and components are operating as expected, and operator actions are performed in accordance with procedures.

EAL momentarily met but the condition is corrected prior to an emergency declaration - If an operator takes prompt manual action to address a condition, and the action is successful in correcting the condition prior to the emergency declaration, then the applicable EAL is not considered met and the associated emergency declaration is not required.

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 EP-PP-01, "*PNPS Emergency Plan*"
- 5.1.2 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 EAL Wall Chart
- 5.2.2 Procedure Number [TBD], "*Emergency Classification and Notification*"
- 5.2.3 Procedure Number [TBD], "*Emergency Action Levels (EALs)*"

5.3 Commitments

None

6.0 ACRONYMS & DEFINITIONS

6.1 Acronyms

CAS	Central Alarm Station
CDE	Committed Dose Equivalent
CFR	Code of Federal Regulations
cps	Counts per Second
EAL	Emergency Action Level
ECL	Emergency Classification Level
El	Elevation
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FSAR	Final Safety Analysis Report
HOO	Headquarters Operations Officer
Hr	Hour
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
NOUE	Notification of Unusual Event
NRC	Nuclear Regulatory Commission
OCA	Owner Controlled Area
ODCM	Off-site Dose Calculation Manual
ORO	Off-site Response Organization
PAG	Protective Action Guide
PD	Permanently Defueled

rem..... Roentgen Equivalent Man
SSW..... Salt Service Water
TEDE Total Effective Dose Equivalent

6.2 Definitions

The following definitions are taken from Title 10 CFR, and related regulatory guidance documents.

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.

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.

The following key terms are necessary for overall understanding the NEI 99-01 emergency classification scheme.

Emergency Action Level (EAL): A pre-determined, site-specific, observable threshold for an Initiating Condition that, when met or exceeded, places the facility in a given ECL.

Emergency Classification Level (ECL): One of a set of names or titles established by the 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, in ascending order of severity, are:

- Unusual Event
- Alert

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.

Selected terms used in IC and EAL statements are set in all capital letters (e.g., ALL CAPS). These words are defined terms that have specific meanings as used in this document. The definitions of these terms are provided below.

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

EXPLOSION: A rapid, violent and catastrophic failure of a piece of equipment due to combustion, chemical reaction or over pressurization. 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 FIRES. 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 licensee to ensure that demands will be met by the facility.

HOSTILE ACTION: An act toward a facility 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 facility. 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: One or more 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 facility and owned by the licensee. Access is normally limited to persons entering for official business.

PROJECTILE: An object directed toward a facility that could cause concern for its continued operability, reliability, or personnel safety.

PROTECTED AREA: The area normally within the facility security fence designated to implement the security requirements of 10 CFR 73.

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 facility. 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 facility response to a transient. The cause of the parameter change or event may be known or unknown.

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 PNPS-TO-NEI 99-01 EAL CROSS-REFERENCE

The following cross-reference table is provided to facilitate association and location of a PNPS EAL within the NEI 99-01, Rev. 6 IC/EAL identification scheme. Further information regarding the development of the PNPS EALs based on the NEI guidance can be found in the EAL Comparison Matrix (Reference 5.2.2).

PNPS Permanently Defueled IC/EALs	NEI 99-01, Rev. 6, Appendix C – Permanently Defueled Station ICs/EALs
PD-AU1	PD-AU1
PD-AA1	PD-AA1
PD-AU2	PD-AU2
PD-AA2	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
PNPS ISFSI ICs/EAL	NEI 99-01, Rev. 6, Section 8 – ISFSI ICs/ EALs
E-HU1	E-HU1

8.0 ATTACHMENTS

- 8.1 Attachment 1, Recognition Category PD EAL Bases
- 8.2 Attachment 2, Recognition Category E EAL Basis

Attachment 1
Recognition Category PD EAL Bases

Recognition Category PD EAL Bases

Recognition Category PD (Permanently Defueled) provides a stand-alone set of ICs/EALs for a permanently defueled facility to consider for use in developing a site-specific emergency classification scheme. PNPS operated under a 10 CFR Part 50 license and has permanently ceased power operations and removed fuel from the reactor vessel. Further, PNPS intends to store the spent fuel within the permanently defueled facility for some period of time.

When in a permanently defueled condition, the licensee typically receives approval from the NRC for exemptions from specific emergency planning requirements. These exemptions reflect the reduced 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 facilities' Final Safety Analysis Report (FSAR). As a result, PNPS has developed a facility-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 typically limit the ECLs to an Unusual Event and an 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 station 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 ICs 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.

Appropriate ICs and EALs from Recognition Categories A, C, F, H, and S of NEI 99-01 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 NEI 99-01, Rev. 6 (e.g., the importance of avoiding both over-classification and under-classification). Nonetheless, PNPS has developed its emergency classification scheme using the exemptions proposed in PNPS Letter. 2.18.035, and the source terms and accident analyses specific to PNPS. Security-related events are also considered.

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

Table PD-1: Recognition Category “PD” Initiating Condition Matrix

UNUSUAL EVENT	ALERT
PD-AU1 Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer.	PD-AA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRem TEDE or 50 mRem thyroid CDE.
PD-AU2 UNPLANNED rise in facility radiation levels.	PD-AA2 UNPLANNED rise in facility radiation levels that impedes facility access required to maintain spent fuel integrity.
PD-HU1 Confirmed SECURITY CONDITION or threat.	PD-HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.
PD-HU2 Hazardous event affecting equipment necessary for spent fuel cooling.	
PD-HU3 Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Unusual Event.	PD-HA3 Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert.
PD-SU1 UNPLANNED spent fuel pool temperature rise.	

PD-AU1

Emergency Classification Level:

Unusual Event

Initiating Condition:

Release of gaseous or liquid radioactivity greater than 2 times the Offsite Dose Calculation Manual (ODCM) limits for 60 minutes or longer.

Emergency Action Level (EAL): (1 or 2)

Notes:

- The Emergency Director should declare the event 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 60 minutes.
 - 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. Reading on ANY Table A-1 effluent monitor that is greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.

Table A-1 Effluent Monitor Classification Thresholds				
Release Point		Effluent Monitor	Alert	NOUE
Gaseous	Rx Bldg Vent Exhaust	RM-1705-32A/B (Panel C910 – units of cps)	2.75E5 cps	2X HI-HI Alarm
Liquid	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm

2. Sample analysis for a gaseous or liquid release indicates a concentration or release rate greater than 2 times the ODCM limits for 60 minutes or longer.

PNPS 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.

PNPS incorporates 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.

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.

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.

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

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).

The radiation monitor that detects gaseous radioactivity effluent release to the environment is the Reactor Building Ventilation Exhaust (RBVE) monitors RM-1705-32A/B (ref. 1).

The RBVE monitor alarms whenever effluent radioactivity release levels approach unacceptable limits. Indication of RBV effluent is provided by process radiation monitors RM-1705-32A/B on Panel C910 and recorder 40-RR-1705-24 on Panel C902 (Ref. 1).

Complete assumptions and inputs for these EAL threshold values are documented from the calculation in Radiological Gaseous Effluent EAL Values (Ref. 2).

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.).

Liquid releases in excess of two times the Hi-Hi alarm that continue for greater than 60 minutes represent an uncontrolled situation and, hence, a potential degradation in the level of safety. The final integrated dose (which is very low in the Unusual Event emergency class) is not the primary concern here; it is the degradation in facility control implied by the fact that the release was not isolated within 60 minutes.

Indication of radwaste effluent is provided by process radiation monitor RM-1705-30 on Panel C910 and recorder RR-1792 (red pen) on Panel C20 (Radwaste Control Room). The Radwaste Effluent Radiation Monitoring System monitors radwaste discharges to the discharge canal and provides alarm and automatic isolation functions if radioactivity levels exceed predetermined setpoints. The alarm and isolation setpoints are calculated for each discharge to ensure ODCM liquid effluent limits are not exceeded (Ref. 3, 4).

At low classification levels, the concern for classification is the continuing, uncontrolled release of radioactivity and not the magnitude of the release. When the liquid release is isolated, the release is no longer continuing nor is it uncontrolled. Therefore, the classification is not appropriate when the liquid release is isolated. Radwaste effluent discharge isolation valves FV-7214A and B close if radwaste effluent radiation levels exceed the Hi-Hi alarm setpoint (Ref. 5).

EAL 2 addresses collecting liquid and gaseous effluent samples to ensure that release conditions above nominal steady state conditions are detected and reported (Refs. 6, 7).

Escalation of the emergency classification level would be via IC PD-AA1.

PNPS Basis Reference(s):

1. PNPS ODCM Section 7.2.3, Reactor Building Exhaust Vent Monitor System
2. PNPS082-CALC-001 Revision 0, PD-AA1 Gaseous Effluent EAL Threshold
3. PNPS ODCM Section 7.1.1, Liquid Radioactive Waste Effluent Release
4. PNPS ODCM Section 8.1, Liquid Effluent Monitor
5. PNPS ODCM Section 7.2.1, Liquid Radioactive Waste Effluent Monitoring System
6. PNPS ODCM Table 4.3-1, Radioactive Gaseous Waste Sampling and Analysis Program
7. PNPS ODCM Table 4.2-1, Radioactive Liquid Waste Sampling and Analysis Program

PD-AA1

Emergency Classification Level:

Alert

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): (1 or 2 or 3 or 4)

Notes:

- The Emergency Director should declare the event 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.
- 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. Reading on **ANY** Table A-1 effluent radiation monitor that is greater than the reading shown in column "Alert" for 15 minutes or longer.

Table A-1 Effluent Monitor Classification Thresholds				
Release Point		Effluent Monitor	Alert	NOUE
Gaseous	Rx Bldg Vent Exhaust	RM-1705-32A/B (Panel C910 – units of cps)	2.75E5 cps	2X HI-HI Alarm
Liquid	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm

2. Dose assessment using actual meteorology indicates doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the site boundary.

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 the site boundary.
4. Field survey results indicate **EITHER** of the following at or beyond (site-specific dose receptor point):
 - Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer.
 - Analyses of field survey samples indicate thyroid CDE greater than 50 mrem for one hour of inhalation.

PNPS 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 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.

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 radiation monitor that detects gaseous radioactivity effluent release to the environment is the Reactor Building Ventilation Exhaust (RBVE) monitors RM-1705-32A/B on Panel C910 (ref .1).

Complete assumptions and inputs for these EAL threshold values are documented from the calculation in PNPS082-CALC-001 Revision 0, PD-AAL Gaseous Effluent EAL Threshold (ref. 2).

The threshold of $> 2.75E5$ is limited to a maximum value of $8E+5$ cps to assure an on-scale readable value.

PNPS Basis Reference(s)

1. PNPS ODCM Section 7.2.3, Reactor Building Exhaust Vent Monitor System
2. PNPS082-CALC-001 Revision 0, PD-AAL Gaseous Effluent EAL Threshold
3. PNPS ODCM Section 7.1.1, Liquid Radioactive Waste Effluent Release
4. PNPS ODCM Section 8.1, Liquid Effluent Monitor
5. PNPS ODCM Section 7.2.1, Liquid Radioactive Waste Effluent Monitoring System
6. PNPS ODCM Table 4.2-1 Radioactive Liquid Waste Sampling and Analysis Program
7. PNPS ODCM Table 4.3-1 Radioactive Gaseous Waste Sampling and Analysis Program

PD-AU2

Emergency Classification Level:

Unusual Event

Initiating Condition:

UNPLANNED rise in facility radiation levels.

Emergency Action Level (EAL): (1 or 2)

1. a. UNPLANNED water level drop in the spent fuel pool as indicated by **ANY** of the following:

- "SPENT FUEL POOL LEVEL LO" (C903R-B2)
- "FUEL POOL LOW LEVEL" (C39-F1)

AND

- b. UNPLANNED rise in area radiation levels as indicated by the following radiation monitor:

- Spent Fuel Pool Area (RIS-1815-3F)

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

PNPS Basis:

This IC addresses elevated facility 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 facility or radioactive materials. Either condition is a potential degradation in the level of safety of the facility.

A water level decrease will be primarily determined by indications from available level instrumentation. Other sources of level indications may include reports from facility 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.

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.

Escalation of the emergency classification level would be via IC PD-AA1 or PD-AA2.

Spent fuel pool level instruments LI-4816A and LI-4816B, located on the back wall of the Control Room, provide a wide range indication of level in the spent fuel pool.

PNPS Basis Reference(s):

1. PNPS 2.2.85, *"Fuel Pool Cooling and Filtering System"*
2. EC 45088, Fukushima - Spent Fuel Pool Level Instrumentation

PD-AA2

Emergency Classification Level:

Alert

Initiating Condition:

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

Emergency Action Levels (EAL): (1 or 2)

1. UNPLANNED dose rate greater than 15 mR/hr in **ANY** of the following areas requiring continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity:

- Main Control Room (RIS-1815-2A, Panel C911)
- Central Alarm Station (CAS) (by survey)

OR

2. UNPLANNED Area Radiation Monitor readings or survey indicate a rise by 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.

- Aux Bay 3' elevation
- Reactor Building 117' elevation, Refueling Floor
- Reactor Building 74' elevation, North
- Reactor Building 91' elevation, South and West

PNPS 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 does not apply to anticipated temporary increases due to planned events. Areas that meet this threshold include the Main Control Room and the Central Alarm Station (CAS).

The Main Control Room Area Radiation Monitor (ARM) RIS-1815-2A on Panel C911 provides indication of area radiation levels in the Main Control Room. The high alarm of the Main Control Room ARM activates Control Room annunciator B7 ("**CONTROL ROOM RAD HI**") on Panel C904LC. The high alarm is set at approximately 1 mR/hr. (Refs. 1, 2, 3).

The CAS area has no permanently installed area radiation monitors that may be used to assess this EAL threshold. Therefore, this threshold must be assessed via local radiation survey (Ref. 4).

PNPS Basis Reference(s):

1. PNPS 2.2.62, "Area Radiation Monitoring System"
2. PNPS 6.5-160, "Calibration of the Area Radiation Monitoring System"
3. PNPS ARP-C904LC-B7
4. PNPS 6.3-064, "Routine Radiological Surveillance Program"

PD-HU1

Emergency Classification Level:

Unusual Event

Initiating Condition:

Confirmed SECURITY CONDITION or threat.

Emergency Action Level (EAL): (1 or 2 or 3)

1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the Station Security Force.
2. Notification of a credible security threat directed at the site.
3. A validated notification from the NRC providing information of an aircraft threat.

PNPS Basis:

This IC addresses events that pose a threat to facility personnel or the equipment necessary to maintain cooling of spent fuel, 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 IC PD-HA1.

Timely and accurate communications between the Station Security Force 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 Offsite Response Organizations (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 references the Station 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.

EAL #2 addresses the receipt of a credible security threat. The credibility of the threat is assessed in accordance with PNPS 5.3.14, "Security Incidents" (Ref. 1.)

EAL #3 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 PNPS 5.3.14.1, "Airborne Threat" (Ref. 2.)

PNPS Basis Reference(s):

1. PNPS 5.3.14m "*Security Incidents*"
2. PNPS 5.3.14.1, "*Airborne Threat*"

PD-HA1

Emergency Classification Level:

Alert

Initiating Condition:

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

Emergency Action Level (EAL): (1 or 2)

1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the Station Security Force.
2. A validated notification from NRC of an aircraft attack threat within 30 minutes of the site.

PNPS Basis:

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 facility and staff for a potential aircraft impact.

Timely and accurate communications between Station Security Force 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, 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.

EAL #2 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 PNPS 5.3.14, "Security Incidents" (Ref. 1.).

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.

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.

PNPS Basis Reference(s):

1. PNPS 5.3.14, Security Incidents

PD-HU2

Emergency Classification Level:

Unusual Event

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
- Seawater bay level > +13'6" MSL (LI-3831A/B)
- Seawater bay level < -13'9" MSL (LI-3831A/B)
- Other events with similar hazard characteristics as determined by the Control Room Supervisor

AND

b. The event has damaged at least one train of a system needed for spent fuel cooling.

AND

c. The damaged system train(s) cannot, or potentially cannot, perform its design function based on **EITHER**:

- Indications of degraded performance
- VISIBLE DAMAGE

PNPS 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 intended 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 EAL 1.c., the first bullet addresses damage to equipment that is in service/operation since indications for it will be readily available.

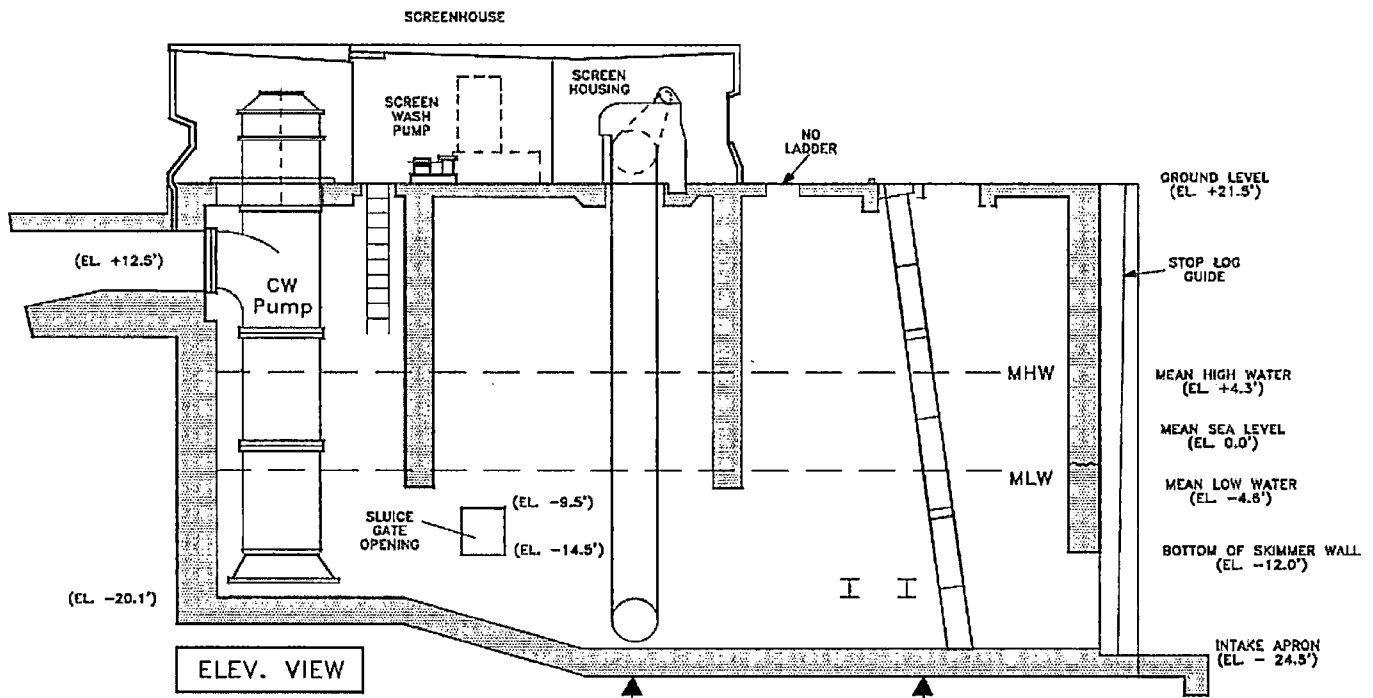
For EAL 1.c., the second bullet addresses damage to equipment that is not in service/operation or readily apparent through indications alone. Operators will make this determination based on the totality of available event and damage report information. This is intended to be a brief assessment not requiring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

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. As illustrated in Figure H-1 (ref. 1, 2), ground level at the screenhouse is +21'6" MSL and well above the flood level of +13'6" MSL. Since the entrances to all structures containing equipment necessary for SFP cooling are at elevations well above +13'6" MSL, they are protected against flooding from external sources. Seawater bay water level < -13'9" MSL is the design minimum level for the SSW pumps.

PNPS Basis Reference(s):

1. PNPS 2.2.94, *"Seawater System"*
2. PNPS 2.4.154 *"Intake Structure Fouling"*
3. PNPS 2.2.32, *"Salt Service Water System (SSW)"*
4. PNPS 8.E.29, *"Salt Service Water System Instrumentation Calibration"*

Figure H-1 Screenhouse Bay Water Levels



+16'0"	Maximum Monitored Water Level
+13'6"	Flood Level
+4'13"	Mean High Tide
0'0"	Mean Sea Level
-4'8"	Mean Low Tide
-7'0"	Design Low Water Level
-10'0"	PNPS 2.4.154 action level to reduce Reactor power and secure affected Seawater Pump
-13'9"	Design Minimum Level for SSW Pumps
-14'6"	Bottom of sluice gates between seawater bays and SSW bays
-15'0"	Calculated worst case level. PNPS 2.4.154 action level to secure affected Seawater Pump (8' below design low water level).
-16'0"	Minimum Monitored Water Level

PD-HU3

Emergency Classification Level:

Unusual Event

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 systems needed to maintain spent fuel cooling occurs.

PNPS 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 a NOUE.

PD-HA3

Emergency Classification Level:

Alert

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.

PNPS 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.

PD-SU1

Emergency Classification Level:

Unusual Event

Initiating Condition:

UNPLANNED spent fuel pool temperature rise.

Emergency Action Level (EAL):

1. UNPLANNED spent fuel pool temperature rise to greater than 125 °F.

PNPS 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.

Escalation of the emergency classification level would be via IC PD-AA1 or PD-AA2.

PNPS Basis Reference(s):

1. FSAR Section 10.4.2

Attachment 2
Recognition Category E EAL Basis

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 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.

Table E-1: Recognition Category “E” Initiating Condition Matrix

UNUSUAL EVENT
E-HU1 Damage to a loaded cask CONFINEMENT BOUNDARY.

E-HU1

Emergency Classification Level:

Unusual Event

Initiating Condition

Damage to a loaded cask CONFINEMENT BOUNDARY.

Emergency Action Level (EAL):

1. Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than EITHER of the following:

- 60 mrem/hr (gamma + neutron) on the top of the OVERPACK

OR

- 600 mrem/hr (gamma + neutron) on the side of the OVERPACK, excluding inlet and outlet ducts

PNPS Basis:

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

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.

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.

While multiple loading arrangements may exist at any one time, the administrative controls regarding on-contact radiation readings are consistent for all loading arrangements at PNPS. On-contact radiation readings are defined as 30 mrem/hr on the top of the overpack, and 300 mrem/hr on the sides of the overpack, excluding near the inlet and outlet ducts per the cask system technical specifications (Ref. 1). The thresholds in this EAL incorporate the two times multiple described above.

Figure E-1 illustrates the HI-STORM 100 Overpack.

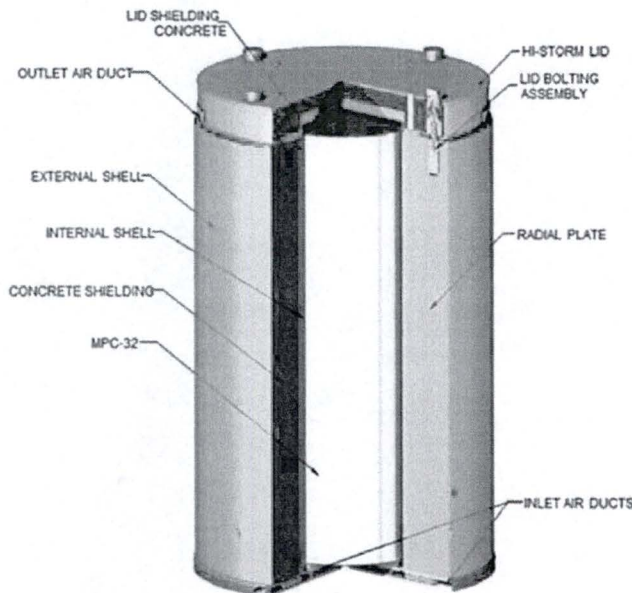
Security-related events for ISFSIs are covered under ICs HU1 and HA1.

PNPS Basis Reference(s):

1. Technical Specifications for the HI-STORM 100 Cask System, Administrative Control 5.7.4

Figure E-1: HI-STORM 100

HI-STORM 100 Overpack



This diagram is also applicable for the MPC-68

Enclosure 3

Letter Number 2.18.035

Permanently Defueled Emergency Action Level Scheme Matrix

(1 page follows)

		ALERT		UNUSUAL EVENT																																					
A Abnormal Rad Levels / Rad Effluent	Effluent Radiation	<div>PD-AA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE.</div> <div>EMERGENCY ACTION LEVEL (EAL): (1 or 2 or 3 or 4)</div> <div>NOTES<ul style="list-style-type: none">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.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.<div>1. Reading on ANY Table A-1 effluent radiation monitor that is greater than the reading shown in column "Alert" for 15 minutes or longer.</div><table><tr><th colspan="5">Table A-1 Effluent Monitor Classification Thresholds</th></tr><tr><th colspan="2">Release Point</th><th>Monitor</th><th>Alert</th><th>UE</th></tr><tr><td rowspan="2">GASEOUS</td><td>Rx Bldg Vent Exhaust</td><td>RM-1705-32A/B (Panel C910 – units of cps)</td><td>2.75E5 cps</td><td>2X HI-HI Alarm</td></tr><tr><td>Radwaste Discharge Effluent</td><td>RM-1705-30 (Panel C910 – units of cps)</td><td>N/A</td><td>2X HI-HI Alarm</td></tr></table><div>2. Dose assessment using actual meteorology indicates doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the site boundary.</div><div>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 the site boundary.</div><div>4. Field survey results indicate EITHER of the following at or beyond (site-specific dose receptor point):<ul style="list-style-type: none">Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer.Analyses of field survey samples indicate thyroid CDE greater than 50 mrem for one hour of inhalation.</div></div>	Table A-1 Effluent Monitor Classification Thresholds					Release Point		Monitor	Alert	UE	GASEOUS	Rx Bldg Vent Exhaust	RM-1705-32A/B (Panel C910 – units of cps)	2.75E5 cps	2X HI-HI Alarm	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm	<div>PD-AU1 Release of gaseous or liquid radioactivity greater than 2 times Offsite Dose Calculation Manual (ODCM) limits for 60 minutes or longer.</div> <div>EMERGENCY ACTION LEVEL (EAL): (1 or 2)</div> <div>NOTES<ul style="list-style-type: none">The Emergency Director should declare the event 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 60 minutes.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.<div>1. Reading on ANY Table A-1 effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.</div><table><tr><th colspan="5">Table A-1 Effluent Monitor Classification Thresholds</th></tr><tr><th colspan="2">Release Point</th><th>Monitor</th><th>Alert</th><th>UE</th></tr><tr><td rowspan="2">GASEOUS</td><td>Rx Bldg Vent Exhaust</td><td>RM-1705-32A/B (Panel C910 – units of cps)</td><td>2.75e5 cps</td><td>2X HI-HI Alarm</td></tr><tr><td>Radwaste Discharge Effluent</td><td>RM-1705-30 (Panel C910 – units of cps)</td><td>N/A</td><td>2X HI-HI Alarm</td></tr></table><div>2. Sample analysis for a gaseous or liquid release indicates a concentration or release rate greater than 2 times the ODCM limits for 60 minutes or longer.</div></div>	Table A-1 Effluent Monitor Classification Thresholds					Release Point		Monitor	Alert	UE	GASEOUS	Rx Bldg Vent Exhaust	RM-1705-32A/B (Panel C910 – units of cps)	2.75e5 cps	2X HI-HI Alarm	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm
	Table A-1 Effluent Monitor Classification Thresholds																																								
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	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm																																					
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Release Point		Monitor	Alert	UE																																					
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	Radwaste Discharge Effluent	RM-1705-30 (Panel C910 – units of cps)	N/A	2X HI-HI Alarm																																					
H Hazards	Plant Rad Levels	<div>PD-AA2 UNPLANNED rise in facility radiation levels that impedes facility access required to maintain spent fuel integrity.</div> <div>EMERGENCY ACTION LEVEL (EAL): (1 or 2)</div> <div>1. UNPLANNED dose rate greater than 15 mR/hr in ANY of the following areas requiring continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity.<ul style="list-style-type: none">Main Control Room (RIS-1815-2A, Panel C911)Central Alarm Station (CAS) (by survey)</div> <div>2. UNPLANNED Area Radiation Monitor readings or survey indicate a rise by 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.<ul style="list-style-type: none">Aux Bay 3' elevationReactor Building 117' elevation, Refueling FloorReactor Building 74' elevation, NorthReactor Building 91' elevation, South and West</div>	<div>PD-AU2 UNPLANNED rise in facility radiation levels.</div> <div>EMERGENCY ACTION LEVEL (EAL): (1 or 2)</div> <div>1.<div>a. UNPLANNED water level drop in the spent fuel pool as indicated by ANY of the following:<ul style="list-style-type: none">"SPENT FUEL POOL LEVEL LO" (C903R-B2)"FUEL POOL LOW LEVEL" (C39-F1)</div><div>AND</div><div>b. UNPLANNED rise in area radiation levels as indicated by the following radiation monitor:<ul style="list-style-type: none">Spent Fuel Pool Area (RIS-1815-3F)</div></div> <div>2. Area Radiation monitor reading or survey result indicates an UNPLANNED rise of 25 mR/hr over NORMAL LEVELS.</div>																																						
	Security	<div>PD-HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.</div> <div>EMERGENCY ACTION LEVEL (EAL): (1 or 2)</div> <div>1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the Station Security Force.</div> <div>2. A validated notification from NRC of an aircraft attack threat within 30 minutes of the site.</div>	<div>PD-HU1 Confirmed SECURITY CONDITION or threat.</div> <div>EMERGENCY ACTION LEVEL (EAL): (1 or 2 or 3)</div> <div>1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the Station Security Force.</div> <div>2. Notification of a credible security threat directed at the site.</div> <div>3. A validated notification from the NRC providing information of an aircraft threat.</div>																																						
	Natural & Destructive Phenomena	None	<div>PD-HU2 Hazardous event affecting equipment necessary for spent fuel cooling.</div> <div>EMERGENCY ACTION LEVEL (EAL):</div> <div>1.<div>a. The occurrence of ANY of the following hazardous events:<ul style="list-style-type: none">Seismic event (earthquake)Internal or external flooding eventHigh winds or tornado strikeFIREEXPLOSIONSeawater bay level > +13'6" MSL (LI-3831A/B)Seawater bay level < -13'9" MSL (LI-3831A/B)Other events with similar hazard characteristics as determined by the Control Room Supervisor</div><div>AND</div><div>b. The event has damaged at least one train of a system needed for spent fuel cooling.</div><div>AND</div><div>c. The damaged system train(s) cannot, or potentially cannot, perform its design function based on EITHER<ul style="list-style-type: none">Indications of degraded performanceVISIBLE DAMAGE</div></div>																																						
S System Malfunction	Judgment	<div>PD-HA3 Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert.</div> <div>EMERGENCY ACTION LEVEL (EAL):</div> <div>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.</div>	<div>PD-HU3 Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Unusual Event.</div> <div>EMERGENCY ACTION LEVEL (EAL):</div> <div>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 systems needed to maintain spent fuel cooling occurs.</div>																																						
E ISFSI		None	<div>PD-SU1 UNPLANNED spent fuel pool temperature rise.</div> <div>EMERGENCY ACTION LEVEL (EAL):</div> <div>1. UNPLANNED spent fuel pool temperature rise to greater than 125 °F.</div>	<div>E-HU1 Damage to a loaded cask CONFINEMENT BOUNDARY.</div> <div>EMERGENCY ACTION LEVEL (EAL):</div> <div>1. Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than EITHER the following:<div>a. 60 mrem/hr (gamma + neutron) on the top of the OVERPACK</div><div>OR</div><div>b. 600 mrem/hr (gamma + neutron) on the side of the OVERPACK, excluding inlet and outlet ducts</div></div>																																					

PERMANENTLY DEFUELED CONDITIONS

IC/EAL Identifier
PD or E-XX#.# - Example (PD-HA1.2)

Category (A, H, S, E)

Emergency Classification (A, U)

EAL number

Category escalation series number

Pilgrim Nuclear Power Station
Emergency Action Level Matrix