Exelon Generation®

4300 Winfield Road
Warrenville, IL 60555
630 657 2000 Office

RS-21-021

10 CFR 50.90
10 CFR 50.54(q)

March 17, 2021

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

Dresden Nuclear Power Station, Units 1, 2, and 3
Amended Facility Operating License No. DPR-2
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-010, 50-237, 50-249, and 72-037

Subject: License Amendment Request - Proposed Changes to the Dresden Nuclear Power Station Emergency Plan and Emergency Action Level Scheme for the Permanently Defueled Condition

References:

1. Letter from J. Bradley Fewell (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations for Dresden Nuclear Power Station, Units 2 and 3," dated September 2, 2020 (NRC Accession No. ML2024627)

2. Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changes to Dresden Emergency Plan for Post-Shutdown and Permanently Defueled Condition," dated November 2, 2020 (ML20307A434)

3. Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E," dated March 17, 2021 (ML21076A439)

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon) requests amendments to Amended Facility Operating Licensed No. DPR-2, and Renewed Facility Operating Licenses Nos. DPR-19 and DPR-25 for Dresden Nuclear Power Station, Units 1, 2, and 3 (Dresden), respectively. The proposed amendments would revise the Site Emergency Plan (SEP) and Emergency Action Level (EAL) scheme for the permanently defueled condition. The proposed changes are being submitted to the U.S. Nuclear Regulatory Commission (NRC) for approval

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

Dresden, Unit 1, has an NRC possession only license and is currently maintained in SAFSTOR.

In Reference 1, in accordance with 10 CFR 50.82(a)(1)(i), Exelon certified that Dresden, Units 2 and 3 would permanently cease power operations on or before November 30, 2021. In Reference 2, Exelon requested NRC approval of changes to the Dresden SEP to support the planned permanent cessation of operation and permanent defueling of the Dresden, Units 2 and 3 reactors. The changes proposed in this submittal will revise the Dresden SEP emergency response organization (ERO) on-shift and augmented staffing, commensurate with the reduced spectrum of credible accidents for a permanently shutdown and defueled nuclear power reactor facility.

The proposed Permanently Defueled Emergency Plan (PDEP) and Permanently Defueled EAL scheme are commensurate with the significantly reduced risk associated with the irradiated fuel stored in the spent fuel pools after it has sufficiently decayed such that the radiological impact of accidents is not expected to result in radioactive releases that exceed U.S. Environmental Protection Agency (EPA) Protective Action Guidelines (PAGs) beyond the site boundary. The proposed changes are necessary to properly reflect the conditions of the facility while continuing to preserve the Dresden Decommissioning Trust Fund and the effectiveness of the emergency plan.

The proposed PDEP and Permanently Defueled EAL scheme are predicated on approval of requests for exemptions from portions of 10 CFR 50.47(b), 10 CFR 50.47(c)(2) and 10 CFR 50, Appendix E, Section IV, submitted in Reference 3. The proposed PDEP reduces the scope of offsite and onsite emergency planning commensurate with the permanently defueled condition. Additionally, the proposed PDEP states that classification of an emergency declaration will be made within 30 minutes after the availability of indications that an EAL threshold has been reached and notification to State and local authorities will be made within 30 minutes after declaring an emergency. The proposed PDEP and Permanently Defueled EAL scheme satisfy the applicable standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E for a permanently defueled reactor, exempted as requested per Reference 3.

Reference 3 includes an analysis that shows that 348 days after permanent cessation of power operations for Unit 2, and 299 days after permanent cessation of power operations for Unit 3, the irradiated fuel stored in the Dresden, Units 2 and 3 spent fuel pools will have decayed to the point where the requested exemptions, PDEP, and Permanently Defueled EAL scheme may be implemented. Dresden, Unit 2 (i.e., the most limiting fuel), will determine the implementation timing of the requested changes, which is expected to occur 348 days after shutdown (Reference 1), which will be on or about October 22, 2022.

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

The description, technical and regulatory evaluation, significant hazards determination, and environmental considerations evaluation for the proposed amendment are contained in Attachment 1. Attachment 2 provides the proposed PDEP. Attachment 3 provides the Permanently Defueled EALs and Bases Document. Attachment 4 provides a comparison of the proposed Permanently Defueled EAL Bases Document to the corresponding information contained in NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6. Attachment 5 contains the State of Illinois acknowledgement of their review and acceptability regarding the proposed changes.

Exelon requests review and approval of the proposed license amendment by October 7, 2022, and a 60-day implementation period from the effective date of the amendment. Exelon requests that the approved amendments become effective 348 days following the permanent shutdown of Dresden, Unit 2. Once effective, implementation will occur within the 60 days, as noted. Approval of these changes by October 7, 2022, will allow Exelon adequate time to implement the changes to the emergency plan and EAL scheme by the requested effective date.

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

In support of this license amendment numerous discussions have been held with the State of Illinois and local response organizations. On March 1, 2021, the Illinois Emergency Management Agency – Division of Nuclear Safety received the draft proposed changes of the Dresden Permanently Defueled Emergency Plan and EAL scheme. Attachment 5 contains acknowledgement from the State of Illinois confirming that they completed their initial review of the proposed Dresden Emergency Plan/EALs.

This letter contains no new regulatory commitments.

If you have any questions concerning this submittal, please contact Mitchel Mathews at (630) 657-2819.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 17th day of March 2021.

Respectfully,

Patrick R. Simpson
Sr. Manager - Licensing
Exelon Generation Company, LLC

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

cc: w/Attachments
NRC Regional Administrator, Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station
NRC Project Manager, NRR – Dresden Nuclear Power Station, Units 2 and 3
NRC Project Manager, NMSS/DUWP/RDB – Dresden Nuclear Power Station, Unit 1
Illinois Emergency Management Agency – Division of Nuclear Safety

Attachment 1

Description and Evaluation of Proposed Changes

Dresden Nuclear Power Station
Amended Facility Operating License No. DPR-2
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-010, 50-237, 50-249, and 72-037

ATTACHMENT 1

License Amendment Request

Dresden Nuclear Power Station, Units 1, 2, and 3

NRC Docket Nos. 50-010, 50-237, 50-249, and 72-037

DESCRIPTION AND EVALUATION OF PROPOSED CHANGES

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

1.0 SUMMARY DESCRIPTION

The proposed changes would revise the Dresden Nuclear Power Station (Dresden) Emergency Plan and Emergency Action Level (EAL) scheme to support the permanent cessation of power operations and permanent removal of fuel from the reactor vessels of Dresden, Units 2 and 3. The Emergency Plan encompasses Dresden, Units1, 2, and 3. Dresden, Unit 1 was permanently shutdown October 31, 1978, and in July 1986, the U.S. Nuclear Regulatory Commission (NRC) issued a license amendment to alter the Dresden, Unit 1, operating license to possession-only status. Dresden, Unit 1, is being maintained in SAFSTOR.

This request contains the proposed Dresden 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 50, Appendix E for permanently defueled reactors, as exempted. Exelon Generation Company, LLC (Exelon) has submitted a separate request for exemptions from portions of 10 CFR 50.47(b); 10 CFR 50.47(c)(2); and 10 CFR 50, Appendix E by letter dated March 17, 2021 (Reference 8.1). Reference 8.1 described an analysis that demonstrated that 348 days after permanent cessation of power operations for Unit 2, and 299 days after permanent cessation of power operations for Unit 3, the irradiated fuel stored in the spent fuel pools (SFPs) will have decayed to the extent that the requested exemptions, PDEP, and Permanently Defueled EAL scheme may be implemented. Implementation is based on 348 days after the permanent shutdown of Unit 2, which is currently scheduled to occur on or before November 30, 2021 (Reference 8.2), and subject to NRC approval of the recently submitted requests for exemptions (Reference 8.1).

2.0 PROPOSED CHANGES

The proposed amendment would modify the Dresden, Units1, 2, and 3 licenses by revising the Site Emergency Plan (SEP) and the associated EAL scheme to reflect the pending permanent cessation of operation and permanent defueling of the Dresden, Unit 2 and 3 reactors, and anticipated conditions following at least 348 days of decay of the irradiated fuel previously occupying the Unit 2 reactor core, or 299 days of decay of the irradiated fuel previously occupying the Unit 3 reactor core, whichever is most limiting.

In a permanently defueled condition, the number and severity of potential radiological accidents is significantly less than when the plant is operating. Therefore, the offsite radiological consequences of accidents possible at Dresden are substantially lower. The analyses of the potential radiological impact of accidents while the plant is in a permanently defueled condition indicate that no design basis accident or reasonably conceivable beyond design basis accident will be expected to result in radioactive releases that exceed U.S. Environmental Protection Agency (EPA) Protective Action Guidelines (PAGs) (Reference 8.3) beyond the site boundary. Exelon will maintain the version of the EPA PAGs as specified in the current and proposed Dresden Emergency Plan.

The slow progression rate of postulated event scenarios indicates sufficient time is available to initiate appropriate mitigating actions to protect the health and safety of the public

(Reference 8.1). Therefore, the proposed PDEP states that classification of an emergency declaration will be made within 30 minutes after the availability of indications that an EAL threshold has been reached and notification to State and local authorities will be within 30 minutes after declaring an emergency. The proposed PDEP reduces the scope of offsite and onsite emergency planning commensurate with the spectrum of credible accidents that can occur in a permanently defueled condition. The proposed PDEP meets the applicable standards of 10 CFR 50.47(b) and requirements of 10 CFR 50, Appendix E, considering the previously submitted requests for exemption (Reference 8.1).

The current EAL scheme is based on the guidance presented in NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6, (Reference 8.4) endorsed by the NRC in a letter dated March 28, 2013 (Reference 8.5). Exelon determined that a revision to the Dresden EAL scheme to implement the EAL scheme contained in Appendix C of NEI 99-01, Rev. 6 (Reference 8.4), Recognition Category PD (Permanently Defueled), is appropriate for the permanently defueled conditions, as a result of the supporting analyses presented in Reference 8.1.

3.0 REASON FOR PROPOSED CHANGES

The proposed changes are necessary to reflect the pending permanent cessation of operation and permanent defueling of the Dresden, Unit 2 and Unit 3 reactors and anticipated conditions following the most limiting of 348 days of decay of the irradiated fuel previously occupying the Unit 2 reactor core, or 299 days of decay of the irradiated fuel previously occupying the Unit 3 reactor core. After the reactors are shutdown, all fuel assemblies will be removed from the reactor vessels and placed in the SFPs. The irradiated fuel will be stored in the SFPs and in the Independent Spent Fuel Storage Installation (ISFSI) until it is shipped off-site.

The proposed revisions to the SEP and EAL scheme are commensurate with the reduction in radiological hazards associated with the permanently defueled condition and will allow the facility to transition to an emergency plan and EAL scheme developed for a permanently defueled facility. The proposed changes are necessary to properly reflect the conditions of the facility the latter of 348 days after permanent cessation of power operations for Unit 2, and 299 days after permanent cessation of power operations for Unit 3 while continuing to maintain the effectiveness of the emergency plan and preserve the Dresden Decommissioning Trust Fund.

4.0 BACKGROUND

The Dresden facility consists of approximately 953 acres located in the northeast quarter of the Morris 15' quadrangle, Goose Lake Township, Grundy County, Illinois. The site boundaries generally follow the Illinois River to the north and the Kankakee River to the south and east, and the Elgin, Joliet and Eastern Railway right-of-way on the west. Unit 1 is located in the northeast quadrant of the site. Unit 1 was shutdown for modification to meet new regulations on October 31, 1978, and has since been placed into SAFSTOR, but its major structures are still present and intact. Unit 2 and Unit 3 are located on the site directly west of and adjacent to Unit 1. The exclusion area boundary (EAB), which is common for all three nuclear units, has a radius of 0.5 miles (800 meters). For the purposes of Emergency Planning, the exclusion area

and the site boundary are considered the same. No public highways or railroads transverse the Exclusion Area Boundary (EAB).

As presented in Section 5.0, the analyses of the potential radiological impact of accidents 348 days after Unit 2, and 299 days after Unit 3 is permanently shutdown indicate that no design basis accident or reasonably conceivable beyond design basis accident will be expected to result in radioactive releases that exceed the EPA PAGs (Reference 8.3) beyond the site boundary.

On or before November 30, 2021, the Dresden, Unit 2 and Unit 3 reactors will be permanently shutdown. After the reactors are shutdown, all fuel assemblies from Unit 2 and Unit 3 will be removed from the reactor vessels and placed in the SFPs. The irradiated fuel will be stored in the SFPs and the ISFSI until it is shipped off-site in accordance with the schedules to be provided in the Post Shutdown Decommissioning Activities Report (PSDAR) and Spent Fuel Management Plan (SFMP). Exelon currently intends to maintain Dresden, Units 2 and 3 in SAFSTOR.

Dresden, Unit 1 has a possession only license and is currently maintained in SAFSTOR. All fuel assemblies have been removed from the Dresden, Unit 1 reactor and SFP.

By letter dated November 2, 2020 (Reference 8.6), Exelon submitted the Post-Shutdown Emergency Plan (PSEP) which describes changes to the Dresden SEP to support the planned permanent cessation of operations and permanent defueling of the Dresden, Units 2 and 3 reactors. The PSEP revises the Dresden SEP emergency response organization (ERO) on-shift and augmented staffing to be commensurate with the reduced spectrum of credible accidents for a permanently shutdown and defueled nuclear power reactor facility. The PSEP maintains effectiveness of the Dresden SEP in accordance with 10 CFR 50.47 and 10 CFR 50, Appendix E.

With the reactors defueled, the reactor vessels and supporting structures and systems are no longer in operation and have no function related to the safe storage and handling of irradiated fuel. The SFP cooling system is provided to remove decay heat from irradiated fuel stored in the SFPs, to maintain SFP water temperature, and to provide for indication of water level.

5.0 TECHNICAL EVALUATION

5.1 Accident Analysis Overview

10 CFR 50.82(a)(2) specifies that the 10 CFR 50 licenses no longer authorize operation of the reactor or emplacement or retention of fuel in reactor vessel after submittal of 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)(ii). Following the termination of reactor operations at Dresden and the permanent removal of the fuel from the reactor vessels, the postulated accidents involving failure or malfunction of the reactors and supporting structures, systems, and components will no longer be applicable.

Section 5.0 of Interim Staff Guidance (ISG)-02 (Reference 8.7) 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 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 are 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 irradiated fuel sabotage; and (4) in the unlikely event of a beyond design basis event resulting in a loss of all SFP cooling, there is sufficient time to implement pre-planned mitigation measures to provide makeup or spray to the SFP before the onset of a zirconium cladding ignition.

Chapter 15, "Accident and Transient Analysis," of the Dresden Final Safety Analysis Report as Updated (UFSAR) describes the Abnormal Operational Transients and Design Basis Accident (DBA) scenarios that are applicable during plant operations. Upon submittal of the certifications required by 10 CFR 50.82(a)(1)(i) and (ii), pursuant to 10 CFR 50.82(a)(2), the Dresden, Units 2 and 3 10 CFR 50 licenses will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels. Therefore, most of the accident scenarios postulated in the UFSAR will no longer be applicable once Dresden is in the permanently defueled condition.

After the reactors are defueled, the irradiated fuel will be stored in the SFPs located in the Reactor Building. While irradiated fuel is stored in the SFPs, the remaining accidents are: 1) a postulated liquid release due to liquid tank failure, and, 2) a fuel handling accident (FHA) that takes place in an SFP. UFSAR Chapter 15 will be revised to eliminate the DBAs that will not be applicable in the permanently defueled condition.

Dresden described these analyses and provided each for NRC review in Reference 8.1. The specific analyses are summarized in the following sections.

5.1.1 Consequences of Design Basis Events

Dresden, Units 1, 2, and 3

The consequences of radioactive liquid tank failures will not result in offsite dose exposures in excess of 10 CFR 100 or EPA limits due to administrative controls placed on the allowable levels of radioactive isotopes contained in the tank.

The FHA is defined as the dropping of a single irradiated fuel assembly from the maximum height allowed by the fuel handling equipment onto the fuel seated in the SFP. The number of fuel pins which experience mechanical damage to the cladding during the postulated accident is calculated to be 179 rods, which is the equivalent of 2.1 Framatome ATRIUM 10XM fuel assemblies. This accident is postulated to occur despite the administrative controls and physical limitations imposed on fuel-handling operations. The gap activity in the damaged rods is instantaneously released into the SFP. According to UFSAR Section 15.7.3.4.2.4.2, "Fuel Handling Accident (FHA)," the analysis assumes the fuel bundle is dropped 34 feet for the fuel damage assessment, but assumes a water depth of only 19 feet above the damaged assemblies for decontamination factor determination using guidance in Regulatory Guide 1.183

and consistent with the limits in the Technical Specifications. These conservative assumptions were utilized in the analysis for an FHA in the SFP.

The FHA dose calculation (Reference 8.9) shows that the dose at the EAB 48 days after shutdown (with no credit for safety systems) is 1.1741×10^{-2} roentgen equivalent man (rem) total effective dose equivalent (TEDE) and 3.7656×10^{-1} rem Thyroid dose. This is less than the EPA PAG of 1 rem TEDE and 5 rem Thyroid, and the accepted 10% EPA PAG for declaration of Site Area Emergency per NEI 99-01, Rev.6 (Reference 8.4), and well before the proposed implementation of the PDEP.

Fuel previously operated in Dresden Unit 1 no longer remains in the Dresden, Unit 1, Unit 2, or Unit 3 SFPs, as it has been previously removed and transferred either to the onsite ISFSI or to the GE Morris facility in Illinois. Thus, only fuel assemblies operated in Unit 2 and Unit 3 are considered as part of the FHA evaluation.

Dresden, Unit 1, was permanently shutdown October 31, 1978. Although spent fuel has been completely removed from storage in the Unit 1 SFP, Chapter 6 of the Dresden, Unit 1, Dresden Defueled Safety Analysis Report (DSAR) (Reference 8.10) describes conservative accident analyses retained for future reference. These analyses demonstrate that postulated accidents will not result in offsite dose exposures in excess of 10 CFR 100 or EPA limits.

This results of this analysis are less than the EPA PAGs and the accepted 10% EPA PAG for declaration of Site Area Emergency per NEI 99-01, Rev.6 (Reference 8.4).

5.1.2 Hottest Fuel Assembly Adiabatic Heat-Up (Zirconium Fire)

The "Zirconium Fire Analysis for Drained Spent Fuel Pool," (Reference 8.11) compared the conditions for the hottest fuel assembly stored in the Dresden SFPs to a criterion proposed in SECY-99-168, "Improving Decommissioning Regulations for Nuclear Power Plants" (Reference 8.12), applicable to offsite emergency response for the unit in the decommissioning process. This criterion considers the time for the hottest assembly to heat up from 30°C to 900°C adiabatically. If the heat up time is greater than 10 hours, then offsite emergency preplanning involving the facility is not necessary. The analysis was submitted for NRC review in Reference 8.1.

Based on the limiting fuel assembly for decay heat and adiabatic heat-up analysis, at the most limiting of 348 days after permanent cessation of power operations for Unit 2, and 299 days after permanent cessation of power operations for Unit 3, the time for the hottest fuel assembly to reach 900°C is greater than 10 hours after the assemblies have been uncovered.

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

5.1.3 Consequences of Other Analyzed Events

NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," (Reference 8.13), Supplement 1, Section 4.3.9, identifies that a SFP drain down event is a beyond design basis event.

The offsite and Control Room radiological impacts of a postulated complete loss of SFP water were assessed in Technical Evaluation EC 633491, "Byron / Dresden Spent Fuel Pool Draindown Shine Dose Rate Evaluation, Revision 0" (Reference 8.14). Byron Station characteristics and irradiated fuel source term were selected for the performance of this evaluation as they conservatively bound those of Dresden. A loss of water shielding above the fuel could increase the offsite radiation levels because of the gamma rays streaming up out of the SFP being scattered back to a receptor at the site boundary. With a decay of 300 days from shutdown, the dose rate at the EAB would be 6.6×10^{-1} mrem per hour (mrem/hr) without crediting the shielding from the Reactor Building roof. Crediting the Reactor Building roof structure, the dose rate at the EAB would be 2.2×10^{-2} mrem/hr. The resultant dose rates at the EAB, if taken over the 10-hour accident duration, would be less than the EPA PAGs and the Site Area Emergency Fraction provided by NEI 99-01, Rev. 6 (Reference 8.4).

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

Although the limited scope of design and beyond design basis accidents that remain applicable to Dresden justify a reduction in the necessary scope of emergency response capabilities, Exelon also evaluated the industry decommissioning commitments (IDCs) and staff decommissioning assumptions (SDAs) contained in NUREG-1738 (Reference 8.17).

The IDCs and SDAs are listed in Tables 4.1-1 and 4.1-2, respectively, of NUREG-1738. Tables 4 and 5 of Exelon's EP exemption request (Reference 8.1, Attachment 1), identify how the Dresden SFPs meet or compare with each of these IDCs and SDAs.

5.1.5 Consequences of a Beyond Design Basis Earthquake

Dresden conducted a seismic evaluation in response to an NRC request for information pursuant to 10 CFR 50.54(f) regarding Recommendation 2.1 of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident. The seismic evaluation included all structures including the SFPs and was prepared and submitted for NRC review. The Exelon submittal (Reference 8.16) documents the seismic evaluation in conformance with NTTF Recommendation 2.1 including the high-confidence-of-low-probability-of-failure (HCLPF) values and the 1×10^{-5} per year hazard level. The NRC staff review of the NTTF submittal, specifically for the SFP evaluation associated with the reevaluated seismic hazard implementing NTTF Recommendation 2.1, is documented in Reference 8.17. The NRC staff concluded that the assessment was performed consistent with the NRC-endorsed (Reference 8.18) SFP Evaluation Guidance Report (Reference 8.19) and provided sufficient information, including the SFP integrity evaluation, to meet the SFP Evaluation Guidance (Item 9 in Enclosure 1 of the NRC's 50.54(f) letter). The Dresden response to other beyond design basis environmental events is also addressed in Tables 4 and 5 of Attachment 1 of Exelon's EP exemption request (Reference 8.1).

5.2 Permanently Defueled Emergency Plan

The PDEP is provided as Attachment 2 of this submittal for NRC review and approval. The PDEP describes the station's plan for responding to emergencies that may arise at Dresden while in a permanently shutdown and defueled configuration. The PDEP was developed considering the guidance contained within Attachment 1 of NSIR/DPR-ISG-02, Interim Staff Guidance, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants" (Reference 8.7).

The analyses of the potential radiological impact of accidents while the facility is in a permanently defueled condition indicate that no design basis accident or reasonably conceivable beyond design basis accident will be expected to result in radioactive releases that exceed EPA PAGs beyond the site boundary or the industry recognized fractional PAG threshold (10% PAG) for a Site Area Emergency (Reference 8.3). This allows for the State to utilize a comprehensive emergency management plan to respond to an event at Dresden. The slow progression rate of postulated event scenarios indicates sufficient time is available to initiate appropriate mitigating actions to protect the health and safety of the public (Reference 8.1). Therefore, the proposed PDEP states that notification of an emergency declaration will be made to State and Grundy County authorities within 30 minutes after an emergency has been declared. Based on the results of the accident analysis, a 30-minute notification time and reduced scope of offsite and onsite emergency response plans can be implemented without undue risk to public health and safety, commensurate with the reduced offsite radiological consequences associated with the defueled and decommissioning status of the facility.

In the event of a large area fire, deliberate attack, or other rapidly developing beyond design basis events, the rapid deployment of offsite resources, including law enforcement, ambulance, and fire/rescue services may be requested by the Dresden facility personnel to assist with the onsite response. These requests would be made via direct contact with local law enforcement using established communications methods, including the 911 system.

The PDEP addresses the applicable regulations contained in 10 CFR 50.47, "Emergency plans" and 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities" and is consistent with the applicable guidance established in ISG-02 (Reference 8.7) 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 8.20) that remain applicable after the previously requested exemptions are approved (Reference 8.1).

5.3 Permanently Defueled Emergency Action Levels

The current and proposed Dresden EAL scheme were developed based on the guidance presented in NEI 99-01, Rev. 6 (Reference 8.4).

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

5.3.1 Differences and Deviations

Attachment 4 provides a cross-reference between each generic EAL contained in NEI 99-01, Revision 6 (Reference 8.4) 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 1 and 2) (Reference 8.21).

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

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

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

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

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

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

5.3.2 Operating Modes and Applicability

The proposed Permanently Defueled EALs apply to the entire Dresden facility and are only applicable to the permanently defueled condition, with all irradiated fuel permanently removed from the reactor vessels and following the most limiting of the following: 348 days of decay of the Unit 2 irradiated fuel after the shutdown of Unit 2, or 299 days of decay of the Unit 3 irradiated fuel after the shutdown of Unit 3. Based on current scheduling, it is projected that the Unit 2 fuel will be most limiting.

5.3.3 State and Local Government Review of Proposed Changes

Emergency planning and responsibilities have historically involved coordination with the State of Illinois. Decommissioning-related emergency plan submittals for Dresden have been discussed with offsite response organizations subsequent to Exelon providing notification that it intends to

permanently cease power operations.

In support of this license amendment, discussions have been held with the State of Illinois and local response organizations. On March 1, 2021, the State of Illinois – Illinois Emergency Management Agency (IEMA) received the draft proposed changes to the Dresden Emergency Plan and EAL scheme. Attachment 5 contains written acknowledgement from the State of Illinois – IEMA dated March 9, 2021, confirming that IEMA completed its initial review of the proposed Dresden PDEP and EALs and that IEMA does not anticipate submitting any concerns to the NRC on the PDEP and EAL scheme, as proposed.

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

5.4 Summary

On September 2, 2020, Exelon submitted a notification of permanent cessation of power operations pursuant to 10 CFR 50.82(a)(1)(i), stating that Exelon has decided to permanently cease power operation of Dresden on or before November 30, 2021 (Reference 8.2). Upon submittal of the certifications of permanent removal of fuel from the reactor vessels in accordance with 10 CFR 50.82(a)(1)(ii), the 10 CFR 50 licenses for Dresden will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels.

Exelon has demonstrated that no postulated accident or reasonably conceivable beyond design basis event will result in radiological releases requiring offsite protective actions. Moreover, 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 8.1).

The proposed amendments would revise the emergency plan and the EAL scheme to reflect the permanently defueled condition following 348 days of decay of the irradiated fuel previously occupying the Unit 2 reactor core and 299 days of decay of the irradiated fuel previously occupying the Unit 3 reactor core. The proposed emergency plan and EAL scheme are being submitted to the NRC for approval prior to implementation, as required under 10 CFR 50.54(q)(4) and 10 CFR 50, Appendix E, Section IV.B.2, and are predicated on approval of exemptions submitted to the NRC (Reference 8.1).

6.0 REGULATORY EVALUATION

The proposed PDEP and Permanently Defueled EAL scheme are predicated on approval of requests for exemptions from portions of 10 CFR 50.47(b); 10 CFR 50.47(c)(2); and 10 CFR 50, Appendix E, Section IV, submitted in Reference 8.1, and as such, they do not meet all the standards of 10 CFR 50.47(b) and requirements of 10 CFR 50, Appendix E. Upon approval of the requested exemptions, the emergency plan and EAL scheme, as revised, will meet the remaining applicable requirements in 10 CFR 50, Appendix E and the planning standards of 10 CFR 50.47(b).

6.1 Applicable Regulatory Requirements and Guidance

Exelon intends to meet the applicable emergency regulatory requirements as discussed below with the requested exemptions previously submitted (Reference 8.1). The requested exemptions are reflected by "strikeout" text in the discussion below.

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

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

10 CFR 50.47(b) establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency. Planning Standard (4) of this section (e.g. 10 CFR 50.47(b)(4)) (with exemption) requires that a licensee's emergency response plan contain the following:

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

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

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

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

> *"The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that*

are to be used for determining when and what type of protective measures should be considered within ~~and outside~~ the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite ~~and offsite~~ monitoring. ~~By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.~~" . . .

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

"A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change."

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

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

In November 2012, NEI published NEI 99-01, Revision 6 (Reference 8.4). The EAL scheme changes 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 8.5). The analyses of the potential radiological impact of accidents while the plant is in a permanently defueled condition indicate that no design basis accident or reasonably conceivable beyond design basis accident will be expected to result in radioactive releases that exceed EPA PAGs beyond the site boundary. The slow progression rate of postulated event scenarios indicates sufficient time is available to initiate appropriate mitigating actions to protect the health and safety of the public (Reference 8.1). Therefore, the Permanently Defueled EALs, detailed in NEI 99-01, Revision 6, will be adopted, with certain differences. Pursuant to 10 CFR 50, Appendix E, Section IV.B.2, a revision to an entire EAL scheme must be approved by the NRC before implementation.

NSIR/DPR-ISG-02, Interim Staff Guidance, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," (Reference 8.7) contains guidance for NRC staff evaluation of decommissioning emergency plans.

The proposed amendments are being submitted to the NRC in accordance with 10 CFR 50.90 for the purpose of revising the Dresden SEP in order to establish an emergency plan appropriate for a permanently defueled facility (e.g., PDEP) and to implement a Permanently Defueled EAL scheme, predicated on approval of the exemptions requested in Reference 8.1.

6.2 Precedents

The changes to the Dresden Emergency Plan and associated EAL scheme, including the change to assess, classify, and declare an emergency within 30 minutes, are consistent with changes to emergency plans and EALs for the transition to a permanently defueled condition that have recently been approved by the NRC for other nuclear power reactor facilities beginning decommissioning. Specifically, the NRC approved similar changes to: 1) Omaha Public Power District's (OPPD) Fort Calhoun Station, Unit 1 on December 12, 2017 (Reference 8.22); and 2) Exelon for the Three Mile Island Nuclear Station on December 2, 2020 (Reference 8.23).

6.3 No Significant Hazards Consideration Determination

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

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

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

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

Response: No.

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

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

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No.

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

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

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

Response: No.

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

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

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

6.4 Conclusion

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

7.0 ENVIRONMENTAL CONSIDERATIONS

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

(i) The amendment involves no significant hazards consideration.

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

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

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

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

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

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

8.0 REFERENCES

8.1. Letter from Patrick R. Simpson, (Exelon) to U.S. Nuclear Regulatory Commission, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E," dated March 17, 2021 (ML21076A439)

8.2. Letter from J. Bradley Fewell (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations for Dresden Nuclear Power Station, Units 2 and 3," dated September 2, 2020 (NRC Accession No. ML20246G627)

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

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

8.5. Letter from Mark Thaggard (USNRC) to Susan Perkins-Grew (NEI), "U.S. Nuclear Regulatory Commission Review and Endorsement of NEI 99-01, Revision 6, Dated November 2012 (TAC No. D92368)," dated March 28, 2013 (ADAMS Accession No. ML12346A463)

8.6. Letter from Patrick R. Simpson (Exelon Generation Company, LLC), to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changes to Dresden Emergency Plan for Post-Shutdown and Permanently Defueled Condition," dated November 2, 2020 (ADAMS Accession Nos. ML20307A434, ML20307A436, ML20307A445, ML20307A455, and ML20307A486)

8.7. NSIR/DPR-ISG-02, Interim Staff Guidance, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," dated May 11, 2015 (ADAMS Accession No. ML14106A057)

8.8. Letter from Patrick R. Simpson (Exelon Generation Company, LLC), to U.S. Nuclear Regulatory Commission – "License Amendment Request – Proposed Defueled Technical Specifications and Revised License Conditions for Permanently Defueled Condition," dated October 29, 2020 (ADAMS Accession No. ML20303A313)

8.9. DR20-0005, "Fuel Handling Accident Dose Consequence (Post Permanent Shutdown)," Revision 0, dated October 9, 2020

8.10. Dresden Nuclear Power Station, Unit 1, Defueled Safety Analysis Report, Revision 10, dated June 2020

8.11. DRE20-0008, "Zirconium Fire Analysis for Drained Spent Fuel Pool," Revision 0, dated January 5, 2021

8.12. U.S. Nuclear Regulatory Commission, Commission Paper SECY-99-168, Improving Decommissioning Regulations for Nuclear Power Plants, dated June 30, 1999 (ADAMS Accession No. ML992800087)

8.13. NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," dated October 2002

8.14. Technical Evaluation EC 633491, "Byron / Dresden Spent Fuel Pool Draindown Shine Dose Rate Evaluation, Revision 0," dated February 24, 2021

8.15. NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," dated February 28, 2001 (ADAMS Accession No. ML010430066)

8.16. Letter from Mr. Glen T. Kaegi (Exelon) to U.S. Nuclear Regulatory Commission, "Exelon Generation Company, LLC, Seismic Hazard and Screening Report (Central and Eastern United States (CEUS) Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 31, 2014 (ADAMS Accession No. ML14091A012)

8.17. Letter from U.S. Nuclear Regulatory Commission to Mr. Bryan C. Hanson (Exelon), "Dresden Nuclear Power Station, Units 2 and 3 - Staff Assessment of Information Provided Pursuant to Title 10 of the Code of Federal Regulations 10 CFR 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dal-ichi Accident (TAC NOS. MF3877 and MF3878)," dated April 27, 2015 (ADAMS Accession No. ML15097A519)

8.18. Letter from Jack R. Davis (U.S. Nuclear Regulatory Commission) to Joseph E. Pollock (Nuclear Energy Institute), "Endorsement of Electric Power Research Institute Report 3002007148, 'Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation,'" dated March 17, 2016 (ADAMS Accession No. ML15350A158)

8.19. EPRI, "Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation," Electric Power Research Institute Technical Update 3002007148, dated February 29, 2016 (ADAMS Accession No. ML16055A021)

8.20. 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 30, 1980 (ADAMS Accession No. ML040420012)

8.21. 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," dated October 8, 2003 (ADAMS Accession No. ML032580518), and Supplement 1 and 2, respectively dated July 13, 2004 (ADAMS Accession No. ML041550395) and December 12, 2005 (ADAMS Accession No. ML051450482)

8.22. Letter from U.S. Nuclear Regulatory Commission, Omaha Public Power District, Fort Calhoun Station, "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 (ADAMS Accession No. ML17276B286)

8.23. Letter from U.S. Nuclear Regulatory Commission to Mr. Bryan C. Hanson (Exelon), "Three Mile Island Station, Units 1 and 2 - Issuance of Amendment No. 299 for Unit 1 Re: Permanently Defueled Emergency Plan and Emergency Action Level Scheme Changes (EPID L-2019-LLA-0144)," dated December 2, 2020 (ADAMS Accession No. ML20261H925)

Attachment 2

Permanently Defueled Emergency Plan

Dresden Nuclear Power Station
Amended Facility Operating License No. DPR-2
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-010, 50-237, 50-249, and 72-037

EXELON GENERATION

DRESDEN STATION

PERMANENTLY DEFUELED EMERGENCY PLAN (PDEP)

REVISION HISTORY

REVISION	EFFECTIVE DATE	REVISION	EFFECTIVE DATE
0	TBD		

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

ADDENDUMS

1.0 INTRODUCTION

The Permanently Defueled Emergency Plan (PDEP) describes the facility's plan for responding to emergencies that may arise at the Dresden Nuclear Power Station (Dresden). The Emergency Plan encompasses Dresden, Units 1, 2, and 3.

This plan is applicable after the Dresden Units have been permanently shutdown and defueled and sufficient time has passed (i.e., 348 days after shutdown of Unit 2, and 299 days after the shutdown of Unit 3, whichever is most limiting) for the hottest fuel assembly to have decayed such that there would be 10 hours prior to the onset of zirconium clad ignition should a beyond design basis event result in the loss of all water from the spent fuel pool (Reference 1). According to 10 CFR 50.82(a)(1)(i) and (ii) Dresden Station is a possession only facility with all irradiated fuel stored in the Spent Fuel Pools (SFPs) and/or the Independent Spent Fuel Storage Installation (ISFSI). An analysis of the possible design basis events and consequences will be presented in the Defueled Safety Analysis Report (DSAR) for Dresden Station.

This PDEP adequately addresses the risks associated with Dresden's conditions following the most limiting decay period described above.

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

1.1. Purpose

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

1.2. Scope

The PDEP has been developed to respond to potential radiological emergencies at Dresden considering the permanently shut down and defueled status. Because there are no postulated accidents that would result in dose consequences that are large enough to require offsite emergency planning, the overall scope of this plan delineates the actions

necessary to safeguard onsite personnel and minimize damage to property. If determined appropriate by government officials, protective actions may be implemented to protect the public using an all hazards approach to emergency planning.

The concepts presented in this plan address the applicable regulations stipulated in 10 CFR 50.47, "Emergency Plans," and 10 CFR, 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities." Exemptions to selected portions of 10 CFR 50.47(b), 10 CFR 50.47(c)(2) and 10 CFR 50, Appendix E are required to be approved by the NRC prior to the implementation of the PDEP. The plan is consistent with the remaining applicable guidelines established in NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Facilities" (NUREG-0654). Appendix 3 contains a cross-reference to the applicable guidance in NUREG-0654.

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

2.0 SUMMARY OF EMERGENCY PLAN

2.1. Overview of Permanently Defueled Emergency Plan

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

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

Emergency services are provided by local public and private entities. Fire and ambulance support services are provided by the Coal City Fire Protection and Ambulance District (Grundy County)

Law enforcement support services are provided by local, state, and federal law enforcement authorities, as appropriate.

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

Dresden is responsible for planning and implementing emergency measures within the Site

Boundary. This plan is provided to meet this responsibility. To carry out specific emergency measures discussed in this plan, detailed Emergency Plan Implementing Procedures (EPIPs) are established and maintained. A list of EPIPs is included in Appendix 2.

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

2.2. Objectives

The basic objectives of this plan are:

1) To establish a system for identification and classification of the emergency condition and initiation of response actions;
2) To establish an organization for the direction of activity within the facility to limit the consequences of the incident;
3) To establish an organization for control of surveillance activities to assess the extent and significance of any uncontrolled release of radioactive material;
4) To identify facilities, equipment and supplies available for emergency use;
5) To establish an engineering support organization to aid the facility personnel in limiting the consequences of and recovery from an event;
6) To establish the basic elements of an emergency recovery program;
7) To specify a system for coordination with federal, state, and local authorities and agencies for offsite support;
8) To develop a communications network between the facility and offsite authorities to provide notification of emergency situations; and
9) To develop a Emergency Plan Training and Exercise program to assure constant effectiveness of the plan.

2.3. Actions in an Emergency

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

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

1) Recognize the emergency condition by observation of EALs;
2) Classify the accident in accordance with the emergency classification system;
3) Initiate emergency procedure(s) applicable to the event;
4) Notify State and Grundy county authorities of emergency conditions;
5) Notify the NRC Operations Center; and
6) Direct and coordinate all emergency response efforts until overall responsibility is assumed by another individual qualified as an Emergency Director.

2.4. Emergency Response Facility

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

2.5. Mobilization

The mobilization scheme is based on the emergency notification plan. The notification system utilizes the facility public address system, commercial telephone lines, and the ERO notification system to notify and mobilize facility personnel. The mobilization scheme ensures that specific technical disciplines can be augmented within appropriate time frames. On-site staff are informed of an emergency condition through the use of the plant public address system, office telephones and/or wireless devices capable of receiving telephone calls and text messages. In the event that personnel required to staff emergency positions are not on-site at the time an emergency is declared, they may be contacted by commercial telephone including land lines and/or wireless devices capable of receiving telephone calls and text messages. Mobilization of the ERO will be conducted under the direction of the Emergency Director, according to personnel assignments and telephone numbers maintained in various telephone directories. Section 7.2, Figure 7.1 and Table 7.1 outline the minimum staffing requirements for the ERO at Dresden.

2.6. State and Local Government Notification and Response

Notification to the State authority (Illinois Emergency Management Agency (IEMA)) and Grundy County are required within 30 minutes after declaring an emergency. The commercial telephone network serves as the primary means to provide emergency notification to State and local agencies. It is used to provide initial and updated notifications and for general information flow between these agencies.

In the event the commercial telephone system is unavailable, wireless communications can be used to make emergency notifications. In addition, electronic means may be used to transmit the notification message.

As part of the State's CEMP, a cooperative arrangement exists among the Illinois State authorities and Dresden concerning radiological emergency preparedness. Dresden's

emergency classification system and notification messages are reviewed with the State of Illinois and Grundy County on an annual basis.

2.7. Federal Government Notification and Response

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

2.8. Technical Support

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

2.9. Mitigation of Consequences of Beyond Design Basis Events

Strategies to mitigate a loss of SFP inventory and prevent a zirconium fire are contained within several operating procedures:

- DOA 1900-01, "Loss of Fuel Pool Cooling"
- OP-AA-201-010-1001, "B.5.b Mitigating Strategies Equipment Expectations"
- DFP 0850-01, "Slow or Rapid Water Level Loss in Fuel Pool/Reactor Cavity"
- DFP 0850-02, "New/Irradiated Fuel Damage"
- FSG-12, "FLEX Spent Fuel Pool Spray"
- FSG-10, "FLEX Spent Fuel Pool Make-Up"
- FSG-30, "FLEX Strategy for Obtaining Alternate Readings"
- FSG-06, "FLEX Strategy for Aligning Power to U2(3) 480 Volt Safety Related Buses 28(38) and 29(39)"
- TSG-3, "Operational Contingency Action Guidelines"
- EP-DR-1000, "Exelon Nuclear Dresden Station Radiological Emergency Plan"

These mitigative strategies support NRC Order on Mitigative Strategies (EA-02-026) and implement the requirements of License Conditions 2.C.(18), and 3(AA), "Mitigation Strategy License Condition," for Dresden, Units 2 and 3, respectively.

3.0 SITE DESCRIPTION

3.1. Facility Description

Dresden is located in the Goose Lake Township of Grundy County in northeastern Illinois. Unit 1 is located in the northeast quadrant of the site with an intake canal extending west from the Kankakee River and a discharge canal extending north to the Illinois River. Unit 1 was permanently shutdown on October 31, 1978. Units 2 and 3 are located on the site directly west of, and adjacent to, Unit 1.

The station property consists of a 953-acre tract of land with boundaries generally following the Illinois River to the north, the Kankakee River to the south and east and the Elgin, Joliet and Eastern Railway right-of-way to the west. In addition to ownership of the 953-acre tract, Exelon Nuclear also leases approximately 17 acres in two narrow strips of river frontage located near the northeast corner of the site from the State of Illinois. The terms of the lease provide that these "buffer" strips shall remain idle.

3.2. Area Characteristics and Land Use

Owner Controlled Area and Exclusion Area

The Owner Controlled Area (OCA) for the Dresden site includes all areas within the site perimeter security fence. The exclusion area boundary (EAB), which is common for all three nuclear units, has a radius of 0.5 miles (approximately 800 meters). No public highways or railroads transverse the EAB.

Population and Population Distribution

The Dresden site is located approximately 13 miles southwest of Joliet, Illinois and 47 miles southwest of Chicago, Illinois. This distance satisfies the requirements of 10 CFR 100 with respect to population center distance.

There is no resident population within the EAB. The transient population within the EAB of the nuclear station consists only of station personnel, contracted workers, visitors, and NRC inspectors.

The transient population in the vicinity of the station outside the EAB comprises workers employed by the various industries in the area and visitors to the many recreational facilities available.

The other closest residences are widely separated in several directions from the station. A single residence is located approximately 0.6 miles southeast of the station on the east shore of the Kankakee River. To the northwest, approximately 0.8 miles from the station, are a temporary construction office trailer and two permanent residences for engineers at the Dresden Island Lock and Dam. At the confluence of the Des Plaines and Kankakee rivers there is a new residential development that includes six houses from 0.8 to 1.0 miles from the station. Three individual

residences are located along the Kankakee Bluffs on the north shore of the Des Plaines and Illinois rivers approximately 0.8 miles to the north-northwest, northeast, and east of the station, respectively.

There is one school located within two-miles of the facility – Minooka High School South Campus. There are several recreational areas (i.e., the Dresden Island Lock and Dam, Autobahn Country Club, and the McKinley Woods County Forest Preserve). There is some seasonal shift in population within a 5-mile radius of Dresden since there are summer cabins on the river islands within the area. Additional transients participate in boating activities in the vicinity of Dresden.

Local Industry and Military Facilities

Portions of the 953-acre tract outside the area occupied by the station are leased to a neighboring farmer for grazing cattle and growing field crops. Approximately 150 acres are used for grazing with appropriate fencing provided to control the approximately 75 head of cattle that may be present during the pasturage season. Field crop cultivation generally occupies about 300 acres. Hunting is permitted on the site outside of the security fenced areas during legally prescribed seasons. A summary of land use is presented in the DSAR.

Adjacent to the site on the southwest side is the GE Morris Operations Facility (NRC Docket 50- 268). It was originally planned as a spent fuel reprocessing facility but is now used for spent fuel storage.

The nearest boundary of the large Joliet Ammunition Plant (36,000 acres) is located approximately 2 miles east of the site and adjacent to a recreational area of about 2500 acres owned by the State of Illinois.

There are additional private recreational facilities such as gun clubs and picnic grounds scattered throughout the strip-mined areas south of the station. A small unnamed public park is also located 1.5 miles east of the station on the Des Plaines River. Public access is available to the Dresden Lock and Dam, and a public path parallels the Illinois and Michigan Canal which is 0.7 miles north of the station at its closest point. The recreational facilities are apparently being actively expanded and improved, and data on daily use indicate a substantial increase in recreationists in recent years. South of the site are some agricultural operations and a large abandoned strip mine.

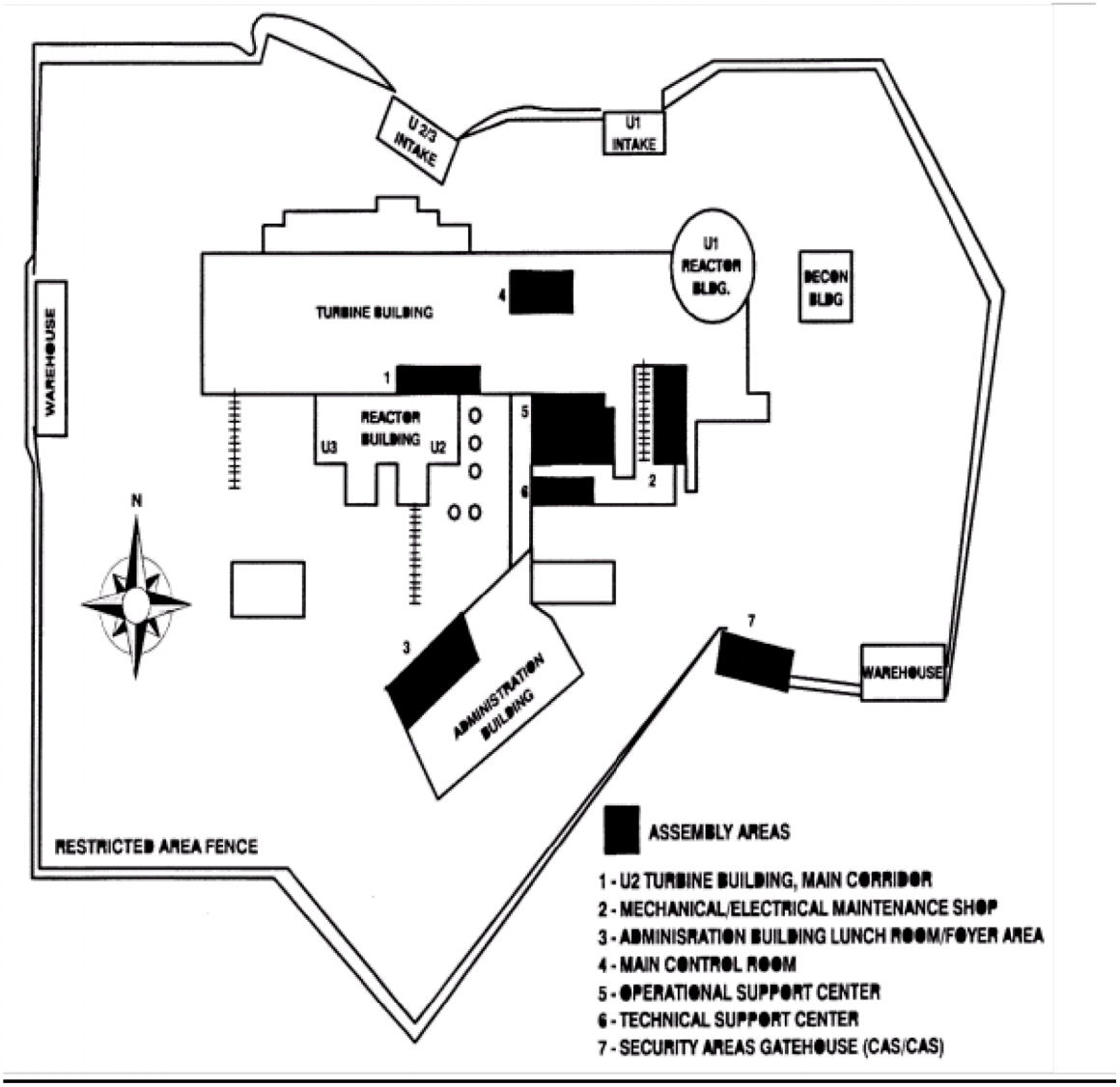
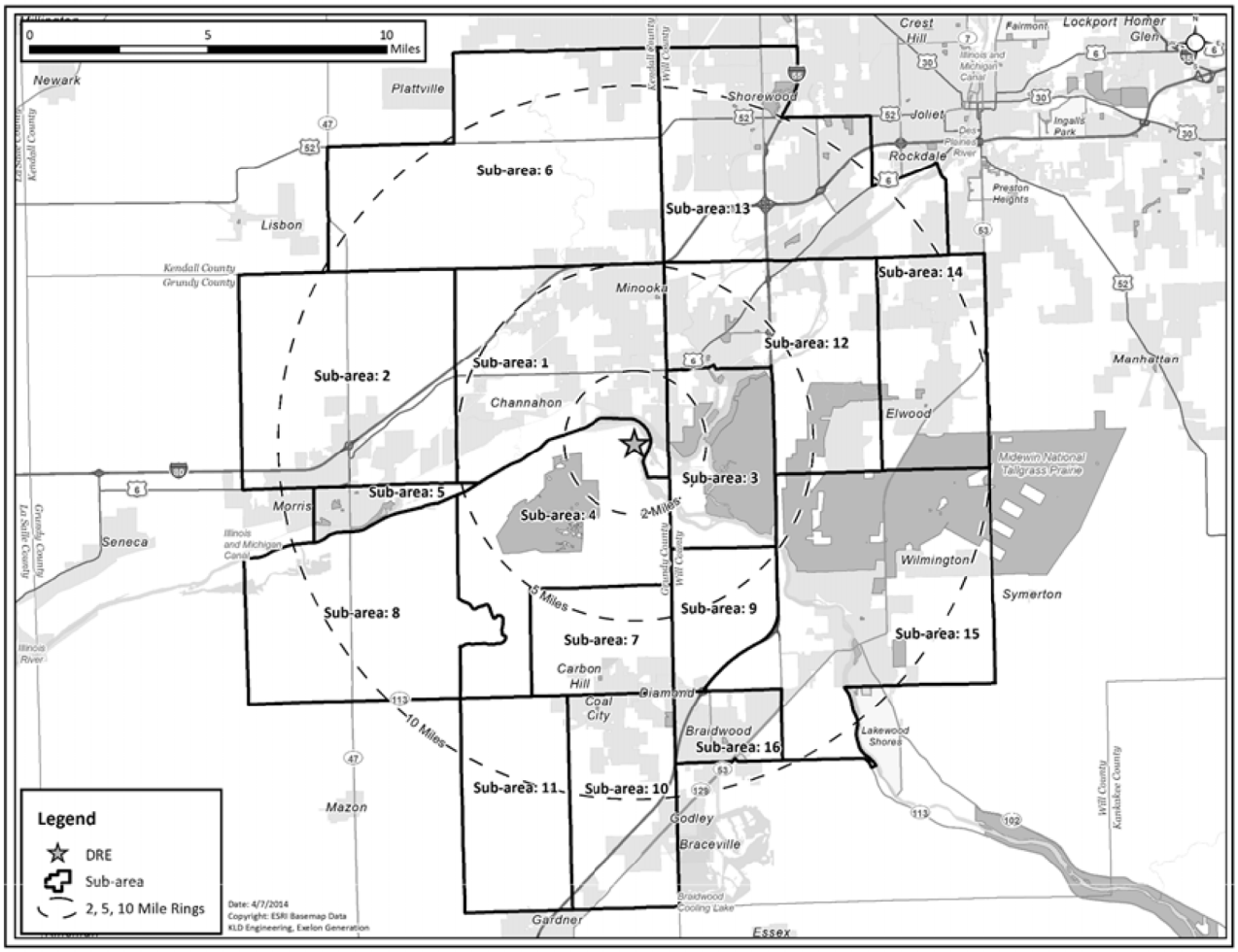


Figure 3.1: Dresden Site Arrangement

Figure 3.2: Dresden Site Relative Location



4.0 EMERGENCY CLASSIFICATION SYSTEM

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

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

Emergency classifications are to be made as soon as conditions are present and recognizable for the classification in accordance with the applicable EALs; but, in all cases, 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. An event will be terminated as described in Section 8.3, "Emergency Termination Criteria."

EALs and EAL bases were derived from NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Rev. 6, for classifying emergencies. Specifically, Appendix C of NEI 99-01, Rev. 6 contains a set of Initiating Conditions / EALs for permanently defueled nuclear power plants that had previously operated under a 10 CFR50 license and have permanently ceased operations, and Section 8 of NEI 99-01, Rev.6 for the Independent Spent Fuel Storage Installation (ISFSI). The classification system referenced in NEI 99-01, Rev. 6 has been endorsed by the NRC and provides a standard method for classifying emergencies.

4.1. Unusual Event

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

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

1) provide for an increased awareness of abnormal conditions;
2) ensure that the first step in any response later found to be necessary has been carried out;

3) bring the on-shift ERO staff to a state of readiness;
4) provide for systematic handling of information and decision-making, and
5) augment on-shift personnel, if deemed necessary by the Emergency Director.

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

4.2. Alert

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

The purpose of the Alert declaration is to:

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

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

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

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

4.3. Emergency Classification System Review by State and Local Authorities

The emergency classification system specified above and the EALs presented in Addendum 1, are reviewed with the applicable State of Illinois and Grundy County authorities annually.

5.0 EMERGENCY RESPONSE FACILITIES AND EQUIPMENT

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

5.1. Control Room

The Control Room is where facility systems and equipment parameters are monitored and is continuously occupied in accordance with Technical Specifications. Control Room personnel assess facility conditions, evaluate the magnitude and potential consequences of abnormal conditions, initiate preventative, mitigating, and corrective actions, and perform notifications. The Control Room is the onsite center for emergency command and control.

The Control Room staff coordinates all phases of emergency response and corrective actions required to restore the facility to a safe condition. Classification and subsequent declaration of the appropriate emergency condition by the Shift Manager may result in activation of the ERO. The Control Room staff's attention focuses on mitigating the emergency as the ERO reports to their designated locations and is delegated emergency functions.

When activated, the ERO reports to the Emergency Director to assist the on-shift staff in the assessment, mitigation, and response to an emergency and to support the dispatch of emergency teams. The composition of the ERO is addressed in Section 7.2.

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

The Control Room contains communications equipment, emergency radiation monitoring equipment, and emergency respiratory devices. Radiation protection clothing and other emergency supplies are readily available in the Unit 2 Trackway on the 517 foot elevation near the main entrance to the plant and radiologically controlled area. The ERO has access to up-to-date technical documentation, including drawings, system information and procedures to enable mitigation planning and support of Control Room staff.

The Control Room is the general assembly area for emergency mitigation and radiation protection personnel.

5.2. Assessment Capability

The activation of the Emergency Plan and the continued assessment of accident conditions require monitoring and assessment capabilities. Dresden maintains and operates on-site monitoring systems needed to provide data that is essential for initiating emergency measures and performing accident assessment, including dose assessment

and assessing the magnitude of a release. This includes monitoring systems for plant processes, radiological conditions, meteorological conditions, and fire hazards. The essential monitoring systems needed are incorporated in the EALs specified in Addendum 1. This section briefly describes monitoring systems as well as other assessment capabilities.

5.2.1. Process Monitors

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

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

5.2.2. Radiological Monitors

A number of radiation monitors and monitoring systems are provided on process and effluent liquid and gaseous lines that serve directly or indirectly as discharge route for radioactive materials. These monitors, which include Control Room readout and alarm functions, exist in order that appropriate action can be initiated to limit fuel damage and/or contain radioactive material.

The Area Radiation Monitoring (ARM) System has monitors that are credited to supporting personnel protection, equipment monitoring, data gathering, and accident assessment. These monitors provide indication and alarms in the Main Control Room to support initiation of required emergency actions when radiation levels or radionuclide concentrations exceed predetermined levels. Area, liquid, and atmospheric monitoring subsystems are required to perform these functions.

The general description of the radiation monitors is provided below, specific details on these monitoring systems such as location, monitoring channels, type, etc., are contained in the DSAR.

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

5.2.2.1. Area Radiation Monitors

The Dresden area radiation monitoring subsystem is comprised of channels, which utilize an ion chamber detector housed in a weatherproof container.

5.2.2.2. Liquid Radiation Monitoring

The liquid radiatioactive waste discharge monitoring system is comprised of detectors, alarms, and Control Room indication. This applies to the Radwaste system for river discharge batch releases and to the Service Water system for continuous releases. Liquid effluent monitoring does not apply to the Waste Water Treatment Facility (WWTF) or Sewage Treatment Plant (STP).

5.2.2.3. Atmospheric Radiation Monitoring

Each installed atmospheric monitor is comprised of a particulate measuring channel, a gaseous measuring channel and may include an iodine measuring channel. The atmospheric radiation monitor system is comprised of monitors with fixed and movable particulate filters, and fixed radioiodine filters. Representative samples are obtained by means of a sampling head placed in a ventilation duct.

Movable airborne monitors are typically used in the spent fuel handling area during fuel handling operations and in the radiochemical laboratory during laboratory sample preparation operations. These monitors are supplemented with various other portable radiation monitors. Each monitor contains three channels for particulate, iodine, and gaseous monitoring, respectively.

5.2.3. Meteorological and Seismic

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

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

Meteorological data can be remotely interrogated by telephone by NRC and State of Illinois.

5.2.4. Fire Detection and Suppression Equipment

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

5.2.5. Assessment Facilities and Equipment

The offsite fire department listed in Appendix 4 notifies the facility of any fire which might have an impact on the facility. Local Law Enforcement Agencies notify Facility Security of any situation in the area which might have an impact on the facility.

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

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

6.0 COMMUNICATIONS

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

This section describes the provisions utilized for prompt communications among principal emergency response organizations, communications with the ERO and communications with the general public. Figure 6.1 depicts the notification paths and the organizational titles from the Exelon Emergency Response Facility (ERF) to Federal, State and local emergency response organizations, and industry support agencies.

Exelon has extensive and reliable communication systems installed at Dresden. Examples of the communications systems may include telephone lines, Voice Over Internet Protocol (VOIP) communication systems, fiber-optic voice channels, cell phones, satellite phones, mobile radio units, and computer peripherals. Communication systems provide:

1) Local Commercial Telephone System

   The commercial telephone system provides for emergency notification system between Dresden and State and local agencies (see Section 2.6). It will be used to provide initial and follow-up notifications and for general information flow between these agencies.

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

2) ERO Notification

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

3) NRC Communications - Emergency Notification System (ENS)

   Communications with the NRC Operations Center will be performed via the NRC ENS circuit or commercial telephone line. This line will be used for event notification and status updates. The ENS is a dedicated telephone system in place between the Control Room and the NRC. Installation and

use of these NRC telephones is under the direction of the NRC.

4) Radio Communications

Radio communication equipment used during normal facility operations will be used in an emergency to communicate with mobile units and to provide backup to the telephone system.

At Dresden, radio capabilities include a ten-channel system that can be utilized from the Control Room, CAS/SAS and mobile vehicle / portable units, as applicable.

5) Facility-Wide Notification Systems

In addition, facility communication links exist to ensure appropriate information transfer capabilities during an emergency. Dresden has the following warning systems / alarms in place to alert facility staff in the event of an emergency:

1) Alarms: Audible alarms are a quick and effective means of communicating emergency warnings on the site. Alarms currently installed at Dresden include:
   - Facility Evacuation Alarm (Siren)
   - Fire Alarm / Fire Detection System

   Each alarm provides a distinctive sound that all site personnel and contractors are trained to recognize and respond to. Dresden has a siren system to warn personnel of an accountability through evacuation during emergency conditions. Upon hearing a continuous two (2) minute siren, all personnel not having emergency assignments will have been instructed to evacuate the facility.

   The Fire Detection System is designed to quickly detect visible or invisible smoke (or other products of combustion) and/or heat in designated areas of the plant. The fire alarm communication systems and subsystems are located at strategic points throughout the plant to warn personnel of a nuclear incident or other emergency conditions.

   Plant alarm systems are sufficient to alert personnel in the event of a fire or need for accountability. These alarm communication systems consist of warning sirens and lights (in high noise areas) and the PA system. Refer to the Dresden DSAR for further description of the facility's fire protection system.

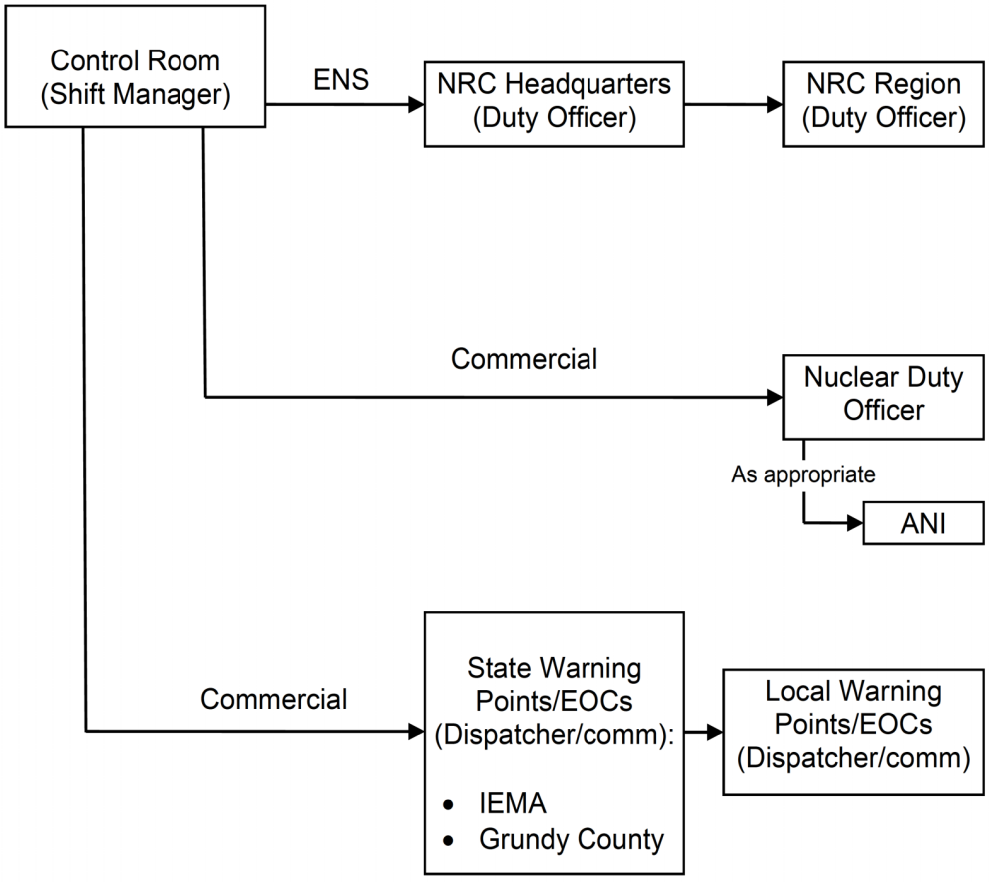
   The Control Room alarm systems consist of overhead annunciators, panel annunciators, and computer alarms. The overhead and panel annunciators consist of flashing translucent tiles and audible indicators (i.e., buzzer or horn). The computer alarms use annunciators and also

provide specific data using the alarm printer. At Dresden, alarm data is also provided by CRTs.

2) Facility Public Address (PA) System: The PA System provides facility-wide paging from the Control Room and all remote stations plus private communications during normal facility conditions.

   The PA system provides immediate warning and instructions to onsite personnel in the event of an emergency. Phone stations and speakers of this subsystem are located in key locations within the facility.

Figure 6.1: Exelon Notification Scheme



7.0 ORGANIZATION

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

7.1. Normal Facility Organization

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

The minimum staff required to conduct routine and immediate emergency mitigation is maintained at the facility. During normal conditions, the minimum staff on duty at the facility during all shifts consists of one (1) Shift Manager, two (2) Non-Certified Operators, one (1) Radiation Protection Technician and security personnel as indicated in Figure 7.1 and Table 7.1. Security and Fire Brigade personnel are staffed in accordance with the Site Security Plan and Fire Protection Plan. The responsibility for monitoring the status of the facility and approving all onsite activities is assigned to the Shift Manager. When an emergency situation becomes apparent, the Shift Manager shall assume the position of Emergency Director once the emergency classification has been made. Additional personnel are available on an on-call basis to respond to facility emergencies.

7.1.1. Shift Manager/Emergency Director

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

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

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

Other responsibilities assumed by the Emergency Director include:

1. Notification of the emergency classification to the State of Illinois, Grundy County, and the NRC, and

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

7.1.2. Non-Certified Operator

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

7.1.3. Radiation Protection Technician

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

7.1.4. Security

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

7.2. Emergency Response Organization

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

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

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

Designated members of the on-shift staff fulfill roles within the ERO appropriate with their

training and experience. For example, Radiation Protection personnel would be expected to undertake radiation protection activities, Security personnel would undertake security activities, engineering personnel would focus on facility assessment, provide technical support, and assist in recovery operations as designated by the Technical Coordinator, Operations personnel would focus on facility operations.

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

7.2.1. Technical Coordinator

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

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

7.2.2. Radiation Protection Coordinator

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

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

7.2.3. Extensions of the Dresden Emergency Response Organization

7.2.3.1. Local Services

Arrangements have been made for the extension of the ERO's capability to address emergencies. Arrangements are in place through letters of agreement for ambulance

services, treatment of contaminated and injured patients, fire support services, and law enforcement response as requested by the facility Evidence of agreements with participating local services is listed in Appendix 4.

7.2.3.2. Federal Government Support

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

7.2.3.3. Additional Support

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

7.2.4. Recovery Organization

The emergency measures presented in this plan are actions designated to mitigate the consequences of the accident in a manner that affords the maximum protection to facility personnel. Planning for recovery involves the development of general principles and an organizational capability that can be adapted to any emergency situation. Upon termination of an emergency, the Emergency Director assembles the recovery organization, as necessary, to address the specific emergency circumstances of the terminated event.

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

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

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

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

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

emergency organization in reducing public hazard and/or facility damage.

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

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

7.3. Coordination with State and Local Government Authorities

Section 6.0 describes the communications network between Dresden, the State of Illinois and Grundy County as a means of promptly notifying appropriate authorities under accident conditions.

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