



Order No. EA-12-049

RA-18-059

May 30, 2018

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

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

Subject: Request for Relief and Rescission of Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)

References:

1. NRC Order EA-12-049, Issuance of Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, dated March 12, 2012
2. Letter from Exelon Generation Company, LLC, Report of Full Compliance with March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order No. EA-12-049), dated December 6, 2016
3. NRC Letter to Exelon Generation Company, LLC, Oyster Creek Nuclear Generating Station – Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051, dated April 19, 2017
4. NRC Letter to Exelon Generation Company, LLC, Oyster Creek Nuclear Generating Station – Temporary Instruction 2515/191 Inspection Report 05000219/2017009, dated November 30, 2017
5. Letter from Exelon Generation Company, LLC, Certification of Permanent Cessation of Power Operations for Oyster Creek Nuclear Generating Station, dated February 14, 2018

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (Reference 1) to all power reactor licensees. Reference 1 was immediately effective and directed Exelon Generation Company, LLC (EGC) to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event at Oyster Creek Nuclear Generating Station (Oyster Creek). Specific requirements are outlined in Attachment 2 of Reference 1.

In accordance with the Order implementation schedule specified in Reference 1, Oyster Creek achieved full compliance with the Order on October 9, 2016. In Reference 2, EGC provided the required report of full compliance with Order EA-12-049 and the associated Final Integrated Plan describing the strategies capable of mitigating a simultaneous loss of all alternating current (AC) power and loss of normal access to the ultimate heat sink resulting from a Beyond-Design-Basis External Event (BDBEE) by providing adequate capability to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling capabilities at Oyster Creek. In Reference 3, the NRC provided the results of their review of the strategies and equipment provided to maintain or restore core cooling, SFP cooling, and containment following a BDBEE at Oyster Creek and concluded that the design adequately addressed the requirements of Order EA-12-049.

In Reference 4, the NRC verified that Oyster Creek had adequately implemented the mitigation strategies as described in the licensee's Final Integrated Plan, and determined that EGC was in compliance with NRC Order EA-12-049.

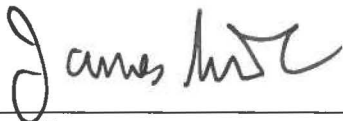
In Reference 5, EGC notified the NRC of EGC's revised plans to permanently shut down Oyster Creek and cease operation no later than October 31, 2018.

The purpose of this letter is to request relief from certain provisions of the Order (Reference 1) upon docketing of the 10CFR50.82(a)(1) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, and to request rescission of the Order effective at the end of the 376-day period following permanent shutdown. The enclosure to this letter provides the good cause justification for this request.

This letter contains no new regulatory commitments. If you have any questions regarding this request, then please contact David J. Distel at 610-765-5517.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30th day of May 2018.

Respectfully submitted,



James Barstow
Director – Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosure: Request for Relief and Rescission of Commission Order Modifying Licenses With Regard To Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)

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cc: Director, Office of Nuclear Reactor Regulation
NRC Regional Administrator – Region I
NRC Senior Resident Inspector – Oyster Creek Nuclear Generating Station
NRC Project Manager, NRR – Oyster Creek Nuclear Generating Station
Mr. John P. Boska, NRR/JLD/JOMB, NRC
Mr. Peter J. Bamford, NRR/JLD/JOMB, NRC
Manager, Bureau of Nuclear Engineering – New Jersey Department of Environmental
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Request for Relief and Rescission of Commission Order Modifying Licenses With Regard To Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)

I. Request for Order Relief and Order Rescission

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (Reference 1) to Exelon Generation Company, LLC (EGC) for Oyster Creek Nuclear Generating Station (Oyster Creek). In accordance with the Order implementation schedule specified in Reference 1, Oyster Creek achieved full compliance with the Order on October 9, 2016. In Reference 2, EGC provided the required report of full compliance with Order EA-12-049 and the associated Final Integrated Plan describing the strategies capable of mitigating a simultaneous loss of all alternating current (AC) power and loss of normal access to the ultimate heat sink resulting from a Beyond-Design-Basis External Event (BDBEE) by providing adequate capability to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling capabilities at Oyster Creek. In Reference 3, the NRC provided the results of their review of the strategies and equipment provided to maintain or restore core cooling, SFP cooling, and containment following a BDBEE at Oyster Creek and concluded that the design adequately addressed the requirements of Order EA-12-049. In Reference 4, the NRC verified that Oyster Creek had adequately implemented the mitigation strategies as described in the licensee's Final Integrated Plan, and determined that EGC was in compliance with NRC Order EA-12-049.

In Reference 5, EGC notified the NRC of EGC's revised plans to permanently shut down Oyster Creek and cease operation no later than October 31, 2018.

In accordance with Section IV of the Order, EGC hereby requests that the NRC grant relief from the requirements of Order EA-12-049 for strategies and equipment provided to maintain or restore core cooling and containment following a BDBEE upon docketing of the 10CFR50.82(a)(1) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, and that the NRC rescind Order EA-12-049 in its entirety effective at the end of the 376-day period following permanent shutdown. Good cause for this request is provided below.

II. Basis for Relief and Rescission Request

Section IV of the Order provides the NRC's Director of the Office of Nuclear Reactor Regulation the authority to relax or rescind any or all of the conditions of the Order upon demonstration by the licensee of good cause.

By letter dated February 14, 2018 (Reference 5) EGC notified the NRC of EGC's revised plans to permanently shut down Oyster Creek and cease operation no later than October 31, 2018.

Section III of the Order states that the Commission determined that all power reactor licensees and construction permit holders must develop, implement and maintain guidance and strategies to restore or maintain core cooling, containment, and Spent Fuel Pool (SFP) cooling capabilities in the event of a beyond-design-basis external event (BDBEE). This statement forms the basis

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of the Order and reflects the need to effectively deploy limited resources to mitigate very low frequency events with the potential to challenge both the reactor and SFP.

Oyster Creek will permanently cease operations no later than October 31, 2018 and it is estimated that all fuel in the reactor will be relocated to the SFP within approximately 12 days of the permanent shutdown date. The lack of fuel in the reactor vessel and the resulting absence of challenges to the primary containment render the development of guidance and strategies to maintain or restore core cooling and primary containment capabilities unnecessary.

With respect to a loss of Fuel Pool Cooling with no makeup, the total time to boil in the SFP and to reduce SFP water inventory to a point 10 ft. above the top of the highest point of any spent fuel rack would be 168 hours (7 days) total. The 7-day period is based on the expected decay heat load following a 376-day period following reactor permanent shutdown. This result is based on a full core offload into the fuel pool and only credits the fuel pool water inventory. The decay heat load required to heat up and boil off the fuel pool water inventory is conservatively demonstrated via formal calculation and retained by EGC (Reference 6). As such, reliance on SFP inventory for passive cooling provides an equivalent level of protection as that which would be provided by the initial phase of the guidance and strategies for maintaining or restoring SFP cooling per the Order. Further, the low decay heat and long time to boil off the inventory to a point at which makeup would be necessary for radiation shielding purposes obviate the need for transition phase guidance and strategies using onsite portable equipment per the Order. Lastly, the low decay heat and long time to boil off the inventory also provides sufficient time for EGC to obtain offsite resources on an ad hoc basis to sustain the SFP cooling function indefinitely, obviating the need for the final phase of guidance and strategies per Order EA-12-049. Additionally, memorandums of understanding are in place with the Forked River, Bayville, and Lanoka Harbor Fire Departments with capabilities to support providing makeup cooling water to the SFP in addition to fire suppression and medical response.

Since Oyster Creek has informed the NRC of the decision to permanently cease power operations and will become a permanently shutdown and defueled facility at the end of the current operating cycle, the safety of the fuel in the SFP becomes the primary safety function for site personnel. In the event of a challenge to the safety of fuel stored in the SFP, decision-makers would not have to prioritize actions and the focus of the staff would be the SFP condition. Thus, the basis for the Order will no longer apply to the configuration of Oyster Creek at the end of the current operating cycle.

III. Spent Fuel Pool Cooling

During Oyster Creek decommissioning, the Spent Fuel Pool Cooling system will be maintained to provide SFP cooling until all spent fuel has been transferred to dry storage containers at the onsite Independent Spent Fuel Storage Installation (ISFSI). The seismically qualified Spent Fuel Pool Cooling system consists of a 2-train redundant system, and a seismically qualified Augmented Spent Fuel Pool Cooling system, providing a total of three (3) trains for SFP cooling. In the unlikely event resulting in the loss of this system, existing Oyster Creek design features

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and capabilities are available for mitigation until the system can be restored, alternate means of cooling established, or offsite resources obtained.

The Oyster Creek spent fuel pool has a large capacity for heat absorption. The normal SFP water level at the event initiation provides for a minimum of 22 ft. of water inventory above the top of the spent fuel racks. Normal SFP temperature is maintained below 115°F by procedure and installed alarms. The Technical Specification maximum allowed temperature of 125°F was conservatively assumed in the analysis as the SFP starting temperature. Using the expected maximum heat load for the permanently defueled condition in which all fuel has been transferred to the pool after permanent shutdown of the reactor, and after 376 days, the decay heat will have reduced to the point where the SFP water inventory, with gates installed, will heat up from 125°F to 212°F and boil down to 10 ft. above the top of the highest point of any spent fuel rack over a period of 168 hours (7 days) without makeup. Existing 10CFR50.54(hh)(2) equipment and procedures will be available to provide makeup to the pool and can be deployed prior to the onset of pool boiling. Even without crediting the 10CFR50.54(hh)(2) equipment, there is sufficient time to obtain offsite resources on an ad hoc basis to sustain SFP cooling indefinitely.

IV. Conclusion

Upon docketing of the 10CFR50.82(a)(1) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, the 10CFR50 license will no longer authorize operation of the reactor or emplacement or retention of fuel into the reactor vessel. Since Oyster Creek is permanently shutting down and defueling, all fuel in the reactor will be relocated to the SFP. Therefore, all nuclear fuel at Oyster Creek will be permanently removed from the reactor vessel and primary containment. The lack of fuel in the reactor vessel and the resulting absence of challenges to the primary containment render the development of guidance and strategies to maintain or restore core cooling and primary containment capabilities unnecessary. SFP cooling guidance and strategies will be maintained until decay heat load from spent fuel has sufficiently decreased as described below.

Spent nuclear fuel at Oyster Creek will be stored either in the SFP or in dry storage at the onsite ISFSI. Since Oyster Creek is permanently shutting down and defueling, no additional fission products will be generated from the plant after shutdown and defueling and the decay heat load on the spent fuel will continue to decline. Loss of SFP level due to lack of cooling would occur slowly due to low decay heat load from spent fuel in the SFP. It has been determined that if SFP cooling is lost at the end of the 376-day period following permanent shutdown then the time to reach boiling and the time to boil off to 10 ft. above the top of the highest point of any spent fuel rack would be 168 hours (7 days) total if no makeup were available. After the 376-day period following permanent shut down, and permanent reactor defueling, all requirements of the Order including SFP cooling guidance and strategies are unnecessary. In the event of a challenge to the safety of fuel stored in the SFP, decision-makers would not have to prioritize event mitigation and recovery actions; the focus of the staff would be the SFP condition, and there is sufficient time to obtain offsite resources on an ad hoc basis to sustain SFP cooling indefinitely. Thus, the basis for the Order will no longer apply to the configuration of Oyster

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Creek. The evaluation that Oyster Creek has performed demonstrates good cause to support EGC's request for relief from the Order requirements for guidance and strategies to maintain or restore core cooling and primary containment capabilities upon docketing of the 10CFR50.82(a)(1) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, and to support EGC's request that the Order be rescinded in its entirety effective at the end of the 376-day period following permanent shutdown.

Based on the above, the Director, Office of Nuclear Reactor Regulation is requested to grant relief from the requirements of Order EA-12-049 for strategies and equipment provided to maintain or restore core cooling and containment following a BDBEE upon docketing of the 10CFR50.82(a)(1) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, and to rescind Order EA-12-049 in its entirety effective at the end of the 376-day period following permanent shutdown.

V. References

1. NRC Order EA-12-049, Issuance of Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, dated March 12, 2012
2. Letter from Exelon Generation Company, LLC, Report of Full Compliance with March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order No. EA-12-049), dated December 6, 2016
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4. NRC Letter to Exelon Generation Company, LLC, Oyster Creek Nuclear Generating Station – Temporary Instruction 2515/191 Inspection Report 05000219/2017009, dated November 30, 2017
5. Letter from Exelon Generation Company, LLC, Certification of Permanent Cessation of Power Operations for Oyster Creek Nuclear Generating Station, dated February 14, 2018
6. Calculation C-1302-226-E540-461, Rev. 0, "Heat Required to Lower Fuel Pool Level to 10 feet Above Fuel"