



Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360

Brian R. Sullivan
Site Vice President

2.18.077

December 14, 2018

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

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

Pilgrim Nuclear Power Station
Docket No. 50-293
Renewed License No. DPR-35

- REFERENCES:**
1. NRC Order Number EA-12-049, Order Modifying Licenses with Regard to Requirements for Beyond-Design-Basis External Events, dated March 12, 2012 (ML12054A735)
 2. Entergy Letter to NRC (Pilgrim Letter 2.15.050) Pilgrim Nuclear Power Station's Notification of Full Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" dated, July 17, 2015 (ML15202A415)
 3. Entergy Letter to NRC (Pilgrim Letter 2.15.080) Notification of Permanent Cessation of Power Operations, dated November 10, 2015 (ML15328A053)

Dear Sir or Madam:

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued order EA-12-049 (Reference 1) to Pilgrim Nuclear Power Station (PNPS). Reference 1 was immediately effective and directed Entergy Nuclear Operations, Inc. (Entergy) to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling capabilities in the event of a beyond-design-basis external event (BDBEE) at PNPS. Specific requirements are outlined in Reference 1.

In accordance with the Order implementation schedule specified in Reference 1, PNPS achieved full compliance with the Order on May 20, 2015. In Reference 2, Entergy provided the required report of full compliance with Order EA-12-049 and the associated Final Integrated Plan describing strategies capable of mitigating a simultaneous loss of all alternating current power and loss of normal access to the ultimate heat sink resulting from a BDBEE by providing

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adequate capability to maintain or restore core cooling, containment, and SFP cooling capabilities at PNPS.

In Reference 3, Entergy notified the NRC of plans to permanently shut down PNPS and cease operation no later than June 1, 2019. The purpose of this letter is to request relief from certain provisions of the Order upon docketing of the Title 10 Code of Federal Regulations, 50.82(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 10-month period following permanent shutdown. The attachment to this letter provides the good cause justification for this request.

This letter contains no new regulatory commitments.

If you have any questions or require additional information, please contact Mr. Peter J. Miner at (508) 830-7127.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 14, 2018.

Sincerely,



Brian R. Sullivan

BRS/rmc

Attachments:

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

cc: Mr. David C. Lew
Regional Administrator, Region I
U. S. Nuclear Regulatory Commission
2100 Renaissance Boulevard, Suite 100
King of Prussia, PA 19406-2713

Mr. John Lamb, Senior Project Manager
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 0-9D12
Washington, DC 20555-0001

NRC Senior Resident Inspector
Pilgrim Nuclear Power Station

Mr. John Giarrusso, Jr.
Planning, Preparedness and Nuclear Section Chief
Mass. Emergency Management Agency
400 Worcester Road
Framingham, MA 01702

Mr. John Priest, Director
Massachusetts Department of Public Health
Radiation Control Program
Commonwealth of Massachusetts
529 Main Street, Suite M2A
Charlestown, MA 02129-1121

Attachment 1

Letter Number 2.18.077

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

(3 Pages)

I. Request for Order Relief and Order Rescission

On March 12, 2012, the U.S. 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 Entergy Nuclear Operations, Inc. (Entergy) for Pilgrim Nuclear Power Station (PNPS). In accordance with the Order implementation schedule specified in Reference 1, PNPS achieved full compliance with the Order on May 20, 2015. In Reference 2, PNPS 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 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 PNPS. 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 PNPS and concluded that the design adequately addressed the requirements of Order EA-12-049.

In Reference 4, Entergy notified the NRC of plans to permanently shut down PNPS and cease operation no later than June 1, 2019. Based on this, Entergy requests 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 10 CFR 50.82(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 10-month period following permanent shutdown. Good cause for this request is provided below.

II. Basis for 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.

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 SFP cooling capabilities in the event of a BDBEE. This statement forms the basis 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.

As noted in Reference 4 PNPS will permanently cease operations no later than June 1, 2019, and it is estimated that all fuel in the PNPS reactor will be relocated to the SFP within approximately 30 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 need to maintain or restore core cooling and primary containment capabilities unnecessary.

With respect to a loss of SFP cooling with no makeup, the total time to boil in the SFP and to reduce SFP water inventory to a point 10 feet above the top of the highest point of any spent fuel rack is estimated to be 211.9 hours (8.83 days) total. The 8.83-day period is based on the expected decay heat load following a 10-month period following reactor permanent shutdown.

This result is based on a full core offload into the SFP and only credits the SFP water inventory. The decay heat load required to heat up and boil off the SFP water inventory is conservatively demonstrated via formal calculation and retained by PNPS. As such, reliance on SFP inventory for passive cooling provides an equivalent level of protection as 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 PNPS to sustain the SFP cooling function indefinitely, obviating the need for the final phase of guidance and strategies per Order EA-12-049.

Since Entergy 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, plant staff would not be required 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 PNPS at the end of the current operating cycle.

III. Spent Fuel Pool Cooling

During PNPS decommissioning, the SFP cooling system will be maintained to provide SFP cooling. The SFP cooling system includes two pumps, two heat exchangers, one back flushable filter, and one mixed bed demineralizer. In the unlikely event of the loss of this system, existing PNPS design features and capabilities are available for mitigation until the system can be restored.

The PNPS SFP has a large capacity for heat absorption. The normal SFP water level at the event initiation is a minimum of 33 feet of water inventory. Normal SFP temperature is procedurally maintained between 70°F and 125°F. The maximum bulk temperature during a normal full core offload is 136°F. The temperature of 136°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 10-months, the decay heat will have reduced to the point where the SFP water inventory, with gates installed, is estimated to heat up from 125°F to 212°F and boil down to 10 feet above the top of the highest point of any spent fuel rack over a period of 211.9 hours (8.83 days) without makeup. Existing 10 CFR 50.54(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.

IV. Conclusion

Upon docketing of the 10 CFR 50.82(a)(1) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, the 10 CFR Part 50 license will no longer authorize operation of the reactor or emplacement or retention of fuel into the reactor vessel. Since PNPS is permanently shutting down and defueling, all fuel in the reactor will be relocated to the SFP. Therefore, all nuclear fuel at PNPS 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 need 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 previously described. Thus, the basis for the Order will no longer apply to the configuration of PNPS. The evaluation that PNPS has performed demonstrates good cause to support Entergy'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 10 CFR 50.82(a)(1) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, and to support Entergy's request that the Order be rescinded in its entirety effective at the end of the 10-month 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 10 CFR 50.82(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 10-month period following permanent shutdown.

References:

1. NRC Order Number EA-12-049, Order Modifying Licenses with Regard to Requirements for Beyond-Design-Basis External Events, dated March 12, 2012 (ML12054A735)
2. Entergy Letter to NRC (Pilgrim Letter 2.15.050) Pilgrim Nuclear Power Station's Notification of Full Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, dated July 17, 2015 (ML15202A415)
3. NRC Letter to Pilgrim Nuclear Power Station – Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051 (TAC Nos. MF0777 and MF0778), dated March 3, 2016 (ML16008B077)
4. Entergy Letter to NRC (Pilgrim Letter 2.15.080) Notification of Permanent Cessation of Power Operations, dated November 10, 2015 (ML15328A053)