



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

May 20, 2020

Vice President, Operations
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 – WITHDRAWAL OF ORDER EA-12-049, “ORDER MODIFYING LICENSES WITH REGARD TO REQUIREMENTS FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS” (EPID NO. L-2019-JLD-0015)

Dear Sir or Madam:

This letter documents the withdrawal of Order EA-12-049, “Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” at Indian Point Nuclear Generating Unit No. 2 (Indian Point Unit 2), in accordance with the timing and technical considerations described below.

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12054A735), the U.S. Nuclear Regulatory Commission (NRC, the Commission) issued Order EA-12-049 to Entergy Nuclear Operations, Inc. (Entergy, the licensee). This order requires certain actions at Indian Point Unit 2 associated with the Fukushima Near-Term Task Force recommendations. Specifically, Order EA-12-049 directed all power reactor licensees, and holders of construction permits in active or deferred status, to develop and implement 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).

Section IV of Order EA-12-049 (the order) required that Entergy submit to the Commission for review an overall integrated plan by February 28, 2013, describing how the licensee will achieve compliance with the requirements of the order at the Indian Point site. The licensee responded to the order by letter dated February 28, 2013 (ADAMS Accession No. ML13079A348). By letter dated August 12, 2016 (ADAMS Accession No. ML16235A292), the licensee notified the NRC that full compliance with the order had been achieved at Indian Point Unit 2. The NRC staff issued a safety evaluation describing its review of the order compliance plan on March 27, 2017 (ADAMS Accession No. ML17065A171), and documented a compliance inspection at the Indian Point site by letter dated January 31, 2018 (ADAMS Accession No. ML18031A358).

Section IV of the order also stipulates that the NRC’s Director of the Office of Nuclear Reactor Regulation may, in writing, relax or rescind any of the conditions of the order upon demonstration by the licensee of good cause.

By letter dated February 8, 2017 (ADAMS Accession No. ML17044A004), Entergy submitted a written certification that it has determined to permanently cease operations at Indian Point in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.82(a)(1)(i). In this letter, Entergy provided notification to the NRC of its intent to permanently cease operations at Indian Point Unit 2 no later than April 30, 2020. By letter dated May 12, 2020 (ADAMS Accession No. ML20133J902), Entergy certified to the NRC that it had permanently ceased operations at Indian Point Unit No. 2 on April 30, 2020. In this letter, the licensee also provided notification to the NRC under 10 CFR 50.82(a)(1)(ii) that, as of May 12, 2020, all fuel has been permanently removed from the Indian Point Unit 2 reactor vessel and placed in the SFP. Further, Entergy confirmed its understanding that, under 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for Indian Point Unit 2 no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel.

By letter dated October 22, 2019 (ADAMS Accession No. ML19295G015), Entergy requested, relief from the provisions of Order EA-12-049 for Indian Point Unit 2 applicable to the core cooling and containment capability safety functions, to be effective upon the docketing of the 10 CFR 50.82(a)(1)(i) and (ii) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel. By letter dated November 20, 2019 (ADAMS Accession No. ML19324G061), Entergy also requested rescission of Order EA-12-049 for Indian Point Unit 2, effective at the end of a 244-day period following the permanent cessation of operations. Entergy states that, after 244 days, the decay heat load in the Unit 2 SFP will have sufficiently decreased to a point where the Order requirements for maintaining the Unit 2 SFP cooling safety function after a BDBEE are not necessary.

According to the licensee's letter dated October 22, 2019, the development, implementation, and maintenance of guidance and strategies to maintain or restore core cooling and primary containment capabilities are now unnecessary at Indian Point Unit 2. This is based on the lack of fuel in the reactor vessel and the resulting absence of challenges to the primary containment. The licensee also noted that the basis for the proposed relaxation of the core cooling and containment capability requirements is consistent with the Statements of Consideration published in the *Federal Register* for the "Mitigation of Beyond-Design-Basis Events, Final Rule [10 CFR 50.155]" on August 9, 2019 (84 FR 36984).

The NRC staff concludes that Entergy has demonstrated good cause for the withdrawal of the core cooling and containment capability safety function requirements specified in Order EA-12-049 with respect to Indian Point Unit 2 based on:

- Entergy's certification provided under 10 CFR 50.82(a)(1) that all fuel has been removed from the Indian Point Unit 2 reactor vessel;
- the regulatory prohibition of 10 CFR 50.82(a)(2) that the 10 CFR Part 50 license for Indian Point Unit 2 no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel; and
- the licensee's acknowledgement that the 10 CFR Part 50 license for Indian Point Unit 2 no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel.

In its letter dated November 20, 2019, the licensee also requested the rescission of Order EA-12-049, effective 244 days after the permanent cessation of operations at Indian Point Unit 2. This portion of the licensee's request relates to the Unit 2 SFP cooling safety function requirements of Order EA-12-049. In its letter, Entergy provided the following information to demonstrate good cause for the requested rescission of Order EA-12-049 for Indian Point Unit 2:

- The fuel in the Indian Point Unit 2 SFP will have had at least 244 days of radioactive decay when the requested withdrawal becomes effective.
- The calculated decay heat level at 244 days after the permanent cessation of operations shows that the time to reach boiling conditions and then reduce SFP water inventory to a level 10 feet above the top of the spent fuel rack would be approximately 75 hours (3.125 days).
- At least 3 days are available to respond to any extended loss of power impacting the normal SFP cooling system prior to water level reaching a point where it may no longer maintain substantial shielding for a person standing on the SFP operating deck.
- Existing Extensive Damage Mitigation Guideline (EDMG) equipment would still be available under the provisions of 10 CFR 50.155(b)(2) (formerly 10 CFR 50.54 (hh)(2)) for deployment to provide makeup to the SFP.
- Letters of Agreement are in place with local fire departments to provide emergency support and trained manpower with the capabilities to provide makeup cooling water for SFP cooling upon request, in addition to fire suppression and medical response.
- The basis for the proposed withdrawal is consistent with the Statements of Consideration published in the Federal Register for the "Mitigation of Beyond-Design-Basis Events, Final Rule [10 CFR 50.155]." Specifically, 10 CFR 50.155(a)(2)(ii) provides an exemption from the applicability of the SFP cooling capability requirements of the regulation once the 10 CFR 50.82(a)(1) certifications have been submitted and it is demonstrated by an analysis, retained by the licensee, that the decay heat of the fuel in the SFP can be removed solely by heating and boiling of water within the SFP and the boil-off period provides sufficient time for the licensee to obtain off-site resources to sustain the SFP cooling function indefinitely.

The NRC staff reviewed the licensee's statements and calculations with regard to decay heat levels. The staff performed a confirmatory evaluation of the licensee's calculations concerning the Unit 2 SFP. The staff considers the licensee's predicted fuel decay heat levels and the SFP thermal hydraulic estimate under loss of cooling conditions to be reasonable.

The NRC staff concludes that Entergy has demonstrated good cause for the withdrawal of the SFP cooling capability safety functions requirements specified in Order EA-12-049 with respect to Indian Point Unit 2 based on:

- Given the low decay heat levels and the slow heat up rate, the reliance on the SFP water inventory for passive cooling will provide a level of protection equivalent to that which would be provided by the initial phase of the guidance and strategies for

maintaining or restoring SFP cooling capabilities, which would otherwise be necessary for compliance with Order EA-12-049.

- The long time for boiling to reduce the SFP inventory to a point at which makeup would be necessary for radiation shielding purposes. This eliminates the need for the transition phase of the guidance and strategies for maintaining or restoring SFP cooling capabilities, which would otherwise be necessary for compliance with Order EA-12-049 through the use of onsite portable equipment.
- The NRC staff notes that the licensee is required to maintain equipment necessary for compliance with the requirements of 10 CFR 50.155(b)(2) (formerly 10 CFR 50.54(hh)(2)) that could be available for deployment to provide SFP inventory makeup, if needed.
- The low decay heat and the long boil-off period of the SFP provides sufficient time for the licensee to obtain off-site resources on an ad hoc basis to sustain the SFP cooling safety function indefinitely. This eliminates the need for the final phase of the guidance and strategies for maintaining or restoring SFP cooling capabilities, which would otherwise be necessary for compliance with Order EA-12-049.
- The request is consistent with the Statements of Consideration published in the *Federal Register* for the "Mitigation of Beyond-Design-Basis Events, Final Rule [10 CFR 50.155]" on August 9, 2019 (84 FR 36984).

The licensee for Indian Point Unit 2 has docketed the 10 CFR 50.82(a)(1)(i) and (ii) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel. In addition, the licensee has acknowledged, consistent with 10 CFR 50.82(a)(2), that the 10 CFR Part 50 license for Indian Point Unit 2 no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel. Therefore, the NRC staff has determined that the licensee has demonstrated good cause for the immediate withdrawal of the Order requirements at Indian Point Unit 2 regarding core cooling and containment capability safety functions.

In addition, the licensee's letter dated November 20, 2019, provided information regarding the calculated decay heat level effective 244 days after the permanent cessation of operations at Indian Point Unit 2, which corresponds to December 30, 2020. Information was also provided with regard to EDMG equipment and off-site resource availability. Based on this information, the NRC staff has concluded that the licensee has demonstrated good cause for the withdrawal of the Order requirements at Indian Point Unit 2 for the SFP cooling safety function effective December 30, 2020.

Based on the above, the NRC staff concludes that the licensee has demonstrated good cause for the withdrawal of Order EA-12-049 for Indian Point Unit 2. Accordingly, with respect to Indian Point Unit 2, the NRC is withdrawing the provisions of its March 12, 2012, Order EA-12-049 regarding core cooling and containment capability, effective immediately. In addition, the NRC is withdrawing, in its entirety, its March 12, 2012, Order EA-12-049, with respect to Indian Point Unit 2, effective December 30, 2020. All other regulatory requirements remain applicable and are not impacted by this withdrawal.

Sincerely,

Ho K. Nieh, Director
Office of Nuclear Reactor Regulation

Docket No. 50-247

cc: Listserv

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 – RELAXATION AND WITHDRAWAL OF ORDER EA-12-049, “ORDER MODIFYING LICENSES WITH REGARD TO REQUIREMENTS FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS” DATED: MAY 20, 2020.

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***Via email**

NRR-106

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