



November 21, 2019

NG-19-0105
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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Duane Arnold Energy Center
Docket No. 50-331
Renewed Facility Operating License No. DPR-49

NextEra Energy Duane Arnold, LLC's Request for Rescission of Commission Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Beyond-Design-Basis External Events"

- References:
1. Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Beyond-Design-Basis External Events," dated March 12, 2012 (ML12054A735)
 2. NextEra Energy Duane Arnold, LLC, "Certification of Permanent Cessation of Power Operations," dated January 18, 2019 (ML19023A196)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (Reference 1) to NextEra Energy Duane Arnold, LLC (NEDA). A discussion of NEDA's implementation of the Order is included in the Enclosure.

By letter dated January 18, 2019 (Reference 2), NEDA provided formal notification to the NRC pursuant to 10 CFR 50.82(a)(1)(i) and 10 CFR 50.4(b)(8) of the intention to permanently cease power operations at the DAEC in the fourth quarter of 2020.

The purpose of this letter is to request relief from certain provisions of Order EA-12-049 upon docketing of the 10 CFR 50.82(a)(1) certifications of permanent cessations of operation and permanent removal of fuel from the reactor vessel, and to request rescission of the Order effective at the end of a 90-day period following permanent shutdown. The enclosure to this letter provides the good cause justification for this request.

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This letter contains no new regulatory commitments. If you have any questions regarding this submittal, please contact Michael Davis, Licensing Manager at 319-851-7032.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on November 21, 2019.

A handwritten signature in black ink, appearing to read "Dean Curtland". The signature is fluid and cursive, with a large loop at the end.

Dean Curtland
Site Director, Duane Arnold Energy Center
NextEra Energy Duane Arnold, LLC

Enclosure

cc: Director, Office of Nuclear Reactor Regulation
USNRC Regional Administrator Region III
USNRC Project Manager, Duane Arnold Energy Center
USNRC Resident Inspector, Duane Arnold Energy Center

Enclosure to NG-19-0105

NextEra Energy Duane Arnold, LLC's Request for Rescission of Commission Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Beyond-Design-Basis External Events"

4 pages follow

1 Request for Order Rescission

NextEra Energy Duane Arnold, LLC (NEDA) hereby submits a request for relief from certain provisions of U.S. Nuclear Regulatory Commission (NRC) Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Beyond-Design-Basis External Events," upon docketing of the Title 10 Code of Federal Regulations (CFR) 50.82(a)(1) certifications for permanent cessation of operation and permanent removal of fuel from the reactor vessel. NEDA also hereby requests rescission of Order EA-12-049 effective at the end of a 90-day period following docketing of the certifications described above.

2 Background

On March 12, 2012, the NRC issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Beyond-Design-Basis External Events," (Reference 1) to all licensees that operate boiling-water reactors with Mark I or Mark II containment designs. The Order was effective immediately and is applicable to the Duane Arnold Energy Center (DAEC). The Order required NEDA to install hardened containment venting systems that can be maintained functional during severe accident conditions (i.e., following significant core damage) and included two separate implementation phases. Phase 1 included modifications to wetwell venting systems, while Phase 2 included modifications to drywell venting systems or implementation of a reliable containment strategy that met regulatory approval.

By letter dated December 7, 2016 (Reference 2), NEDA notified the NRC, as required by Item IV.C.3 of Order EA-12-049, that full compliance with the requirements of the Order, for Phases 1 and 2, had been achieved for the DAEC. 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 Beyond-Design-Basis External Event (BDBEE) at DAEC and concluded that the design adequately addressed the requirements of Order EA-12-049.

By letter dated January 18, 2019 (Reference 4), NEDA provided formal notification to the NRC pursuant to 10 CFR 50.82(a)(1)(i) and 10 CFR 50.4(b)(8) of the intention to permanently cease power operations at the DAEC in the fourth quarter of 2020. Consequently, NEDA requests relief from the requirements of NRC Order EA-12-049 for strategies and equipment provided to maintain or restore core cooling and containment following a BDBEE upon docketing of the Title 10 Code of Federal Regulations (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 90-day period following permanent shutdown.

Order EA-13-109, Section IV, states that the Director, Office of Nuclear Reactor Regulation may, in writing, relax or rescind any of the above conditions upon demonstration by the Licensee of good cause.

3 Basis for Rescission Request

Section III of Order EA-12-049 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 for 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.

Core Cooling and Containment Requirements

As noted in Reference 4, the DAEC will permanently cease operations in the fourth quarter of 2020; all fuel in the DAEC reactor will be relocated to the SFP shortly thereafter. The lack of fuel in the reactor vessel and the resulting absence of challenges to the primary containment render the need to maintain and restore core cooling and primary containment capabilities unnecessary. Upon permanent shutdown and defueling, primary containment will have no design function regarding protection of the fuel in the SFP or mitigation of SFP accident scenarios. This forms the basis for NEDA's request for relief from the requirements of Order EA-12-049 related to core cooling and containment strategies docketing of the 10 CFR 50.82(a)(1) certifications.

Spent Fuel Pool Requirements

The SFP cooling requirements of Order EA-12-049 will continue to apply to DAEC until such time the fuel has sufficiently decayed, as discussed below.

NEDA has determined that for a loss of SFP cooling with no makeup capabilities, the total time to boil the SFP and to reduce SFP water inventory to a point 10 feet above the top of the highest point of the fuel assembly is calculated to be 67.2 hours (2.8 days) total. The 2.8-day period is based on the expected decay heat load following a 90-day period following reactor 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 DAEC. 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 DAEC to sustain the SFP cooling function indefinitely, obviating the need for the final phase of guidance and strategies per Order EA-12-049.

Once NEDA has docketed the 10 CFR 50.82(a)(1) certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, the safety of the fuel in the SFP becomes the primary safety function for facility personnel. In the event of a challenge to the safety of fuel stored in the SFP, facility personnel 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 permanently shut down and defueled DAEC facility.

NEDA has performed an evaluation demonstrating that, 90 days after permanent shutdown, adequate time and water resources will be available to restore spent fuel pool cooling to maintain spent fuel pool water level 10 feet above the top of the spent fuel and the low decay heat and long time to boil off inventory provides sufficient time for DAEC to sustain the SFP cooling function indefinitely. Specifically, DAEC's standard portable fire pumps deliver adequate head and flow to provide the minimum required makeup to the SFP. The evaluation indicates this equipment can be installed in approximately 6 hours to deliver SFP makeup. The required equipment and installation procedures are required to be maintained per DAEC Operating License section 2.C.(9), "Mitigation Strategy License Condition," item (b)(7).

Based on the above, the requirements of Order EA-12-049 should be rescinded 90 days after 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 proposed request is similar to those approved by the NRC for the permanently shut down and defueled Kewaunee Power Stations (ML14059A411), Vermont Yankee Nuclear Power Station (ML14321A685), Fort Calhoun Station Unit 1 (ML17124A114), and Pilgrim Nuclear Power Station (ML19094A632).

4 Conclusion

Upon docketing of the 10 CFR 50.82(a)(1) certifications of 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 in the reactor vessel. Consequently, all fuel in the reactor will be relocated to the SFP. 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 DAEC. NEDA has demonstrated good cause to support the 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

NEDA's request that the Order be rescinded, in its entirety, effective at the end of the 90-day period following permanent shutdown.

Based on the above, the Director, Office of Nuclear Reactor Regulation (NRR) is requested to grant relief from the requirements of Order EA-12-049, for strategies and equipment provided to maintain and 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 90-day period following permanent shutdown.

5 References

1. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigating Strategies for Beyond-Design-Basis External Events," dated March 12, 2012 (ML12054A735)
2. NextEra Energy Duane Arnold, LLC, "Notification of Full Compliance with Order EA-12-049 Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events and Submittal of Final Integrated Plan," dated December 7, 2016 (ML16347A010)
3. NRC letter, "Duane Arnold Energy Center – Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051," dated May 26, 2017 (ML17129A037)
4. NextEra Energy Duane Arnold, LLC, "Certification of Permanent Cessation of Power Operations," dated January 18, 2019 (ML19023A196).