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

April 25, 2022

Mr. Bob Coffey
Executive Vice President, Nuclear
and Chief Nuclear Officer
Florida Power & Light Company
Mail Stop: EX/JB
700 Universe Boulevard
Juno Beach, FL 33408

SUBJECT: DUANE ARNOLD ENERGY CENTER - ISSUANCE OF AMENDMENT NO. 318 TO RENEWED FACILITY OPERATING LICENSE TO IMPLEMENT THE INDEPENDENT SPENT FUEL STORAGE INSTALLATION EMERGENCY PLAN (EPID L-2021-LLA-0120)

Dear Mr. Coffey:

The U.S. Nuclear Regulatory Commission (Commission, NRC) has issued the enclosed Amendment No. 318 to Renewed Facility Operating License No. DPR-49, for the Duane Arnold Energy Center (DAEC). The amendment consists of changes to the DAEC Emergency Plan in response to your application dated June 28, 2021 (Agencywide Documents Access and Management System (ADAMS) ML21179A286), as supplemented by letter dated December 16, 2021 (ADAMS Accession No. ML21350A097). Notice of the application was published in the *Federal Register* (FR) on September 7, 2021 (86 FR 50190); the supplemental letter dated December 16, 2021, provided additional information that clarified the application, but did not expand the scope of the application as originally noticed, or change the NRC's original proposed no significant hazards consideration determination.

The amendment revises the DAEC Emergency Plan to reflect the requirements associated with emergency preparedness necessary for the independent spent fuel storage installation (ISFSI)-only configuration, consistent with the permanent removal of all spent fuel from the DAEC spent fuel pool. Specifically, the amendment implements a revision to the DAEC Emergency Plan and an associated Emergency Action Level scheme to implement the DAEC ISFSI-Only Emergency Plan (IOEP), which reflects the movement of all spent fuel into dry storage within the onsite ISFSI, an action that was completed on April 10, 2022 (see ADAMS Accession No. ML22101A252).

As discussed in the enclosed safety evaluation, the NRC staff has reviewed the proposed changes to the DAEC IOEP, and concluded that the proposed changes meet the standards of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.47, "Emergency plans," and the requirements of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, as exempted, and continue to provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the DAEC site. Therefore, the proposed changes, as outlined in the letters referenced above, are considered acceptable. The basis for the NRC staff's conclusion is contained in the attached safety evaluation.

The amendment is provided as Enclosure 1. This license amendment is effective upon issuance and shall be implemented within 90 days of the effective date. A copy of the related safety evaluation is also enclosed as Enclosure 2. A Notice of Issuance will be included in the Commission's monthly *Federal Register* notice.

Pursuant to paragraph (c)(10) of 10 CFR 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," the Commission has determined that the issuance of this amendment is categorically excluded and pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's ADAMS. ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html.

If you or your staff have any questions regarding the above, please contact me at 301-415-3178 or via email at marlayna.doell@nrc.gov

Sincerely,

Signed by Doell, Marlayna
on 04/25/22

Marlayna V. Doell, Project Manager
Reactor Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket Nos. 50-331 and 72-32

Enclosures:
1. Amendment No. 318 to
   Renewed License No. DPR-49
2. Safety Evaluation

cc: Duane Arnold Listserv

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

NEXTERA ENERGY DUANE ARNOLD, LLC

DUANE ARNOLD ENERGY CENTER

DOCKET NOS. 50-331 AND 72-32

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 318
Renewed License No. DPR-49

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by NextEra Energy Duane Arnold, LLC dated June 28, 2021, as supplemented by letter dated December 16, 2021, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in Title 10 of the Code of Federal Regulations (10 CFR), Chapter I, and all required notifications to other agencies or bodies have been duly made;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's rules and regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 318, Renewed Facility License No. DPR-49 is hereby amended to authorize the revision to the Duane Arnold Energy Center Emergency Plan to implement an Independent Spent Fuel Storage Installation (ISFSI)-Only Emergency Plan, as set forth in the application dated June 28, 2021, as supplemented by letter dated December 16, 2021, and as evaluated in the NRC staff's safety evaluation issued with this amendment.

3. This license amendment is effective upon issuance and shall be implemented within 90 days of the effective date.

FOR THE NUCLEAR REGULATORY COMMISSION

Snyder, Amy signing on behalf
of Watson, Bruce
on 04/25/22

Bruce A. Watson, CHP, Chief
Reactor Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Date of Issuance: April 25, 2022

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

SAFETY EVALUATION BY

THE OFFICE OF NUCLEAR SECURITY AND INCIDENT RESPONSE

RELATED TO AMENDMENT NO. 318 TO

RENEWED FACILITY OPERATING LICENSE NO. DPR-49

DUANE ARNOLD ENERGY CENTER

DOCKET NOS. 50-331 AND 72-32

1.0 INTRODUCTION

The Duane Arnold Energy Center (DAEC) is located on the western side of a north-south reach of the Cedar River, approximately 2.5 miles north-northeast of the village of Palo, Iowa. The closest city is Cedar Rapids, Iowa with its outer boundary being 8 miles to the southeast. The site is approximately 500 acres owned by NextEra Energy Duane Arnold, LLC (NEDA, the licensee) and all site activities are under the control of NEDA. The Independent Spent Fuel Storage Installation (ISFSI) is located within a protected area on the site. NEDA is the holder of the Renewed Facility Operating License No. DPR-49, issued pursuant to the Atomic Energy Act of 1954, as amended, and Part 50, "Domestic Licensing of Production and Utilization Facilities," of Title 10 of the *Code of Federal Regulations* (10 CFR).

By letter dated January 18, 2019 (Reference 1), pursuant to 10 CFR 50.82(a)(1)(i), NEDA certified to the U.S. Nuclear Regulatory Commission (NRC) that it would permanently cease power operations at DAEC in the fourth quarter of 2020. By letter dated March 2, 2020 (Reference 2), pursuant to 10 CFR 50.82(a)(1)(i), NEDA updated its timeline and certified to the NRC that it would permanently cease power operations at DAEC on October 30, 2020. Subsequently, DAEC ceased power operations on August 10, 2020. By letter dated August 27, 2020 (Reference 3), NEDA certified, pursuant to 10 CFR 50.82(a)(1)(i), that DAEC had permanently ceased power operations. By letter dated October 12, 2020 (Reference 4), pursuant to 10 CFR 50.82(a)(1)(i) and 10 CFR 50.82(a)(1)(ii), NEDA certified that fuel had been permanently removed from the DAEC reactor vessel. Upon docketing of these certifications, the DAEC operating license no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel.

By application dated June 28, 2021 (Reference 5), as supplemented by letter dated December 16, 2021 (Reference 6), NEDA requested prior approval by the NRC of the proposed DAEC ISFSI-Only Emergency Plan (IOEP) and associated permanently defueled Emergency Action Levels (EALs), to support the planned transfer of the spent fuel from the DAEC spent fuel pool (SFP) to the onsite ISFSI. Those proposed changes reflected the decommissioning status of the facility, as well as the reduced scope of potential radiological accidents after the spent fuel had been moved from the SFP to dry storage within the onsite ISFSI. By letter dated

April 11, 2022, NEDA notified the NRC that, as of April 10, 2022, all spent nuclear fuel assemblies at DAEC had been transferred out of the DAEC SFP and had been placed in dry storage within the DAEC ISFSI (Reference 7).

The supplement, dated December 16, 2021, provided additional information that clarified the application, but did not expand the scope of the application as originally noticed and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on September 7, 2021 (86 FR 50190).

2.0 REGULATORY EVALUATION

This safety evaluation addresses the acceptability of the proposed DAEC IOEP and associated EAL scheme. This plan would replace the existing DAEC Permanently Defueled Emergency Plan (PDEP) and associated permanently defueled EALs as all spent fuel has been transferred from the DAEC SFP to dry cask storage within the onsite ISFSI.

NEDA states that the proposed DAEC IOEP addresses 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” (as previously exempted by the NRC in a letter dated April 13, 2021 (Reference 8)), and is consistent with the regulations in 10 CFR 72.32 and 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 Plants” (Reference 9).

The major changes from the PDEP and associated permanently defueled EALs contained in the proposed DAEC IOEP and associated EAL scheme were reviewed to the following regulations, as exempted:

- 10 CFR 50.47(b)(1), as exempted, states, in part: “... each principal response organization has staff to respond and to augment its initial response on a continuous basis.”

- 10 CFR 50.47(b)(2) states, in part: “... adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available....”

- 10 CFR 50.47(b)(4), as exempted, states, in part: “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….”

- 10 CFR Part 50, Appendix E, Section IV.A states, in part: “The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee’s emergency organization.…”

- 10 CFR Part 50, Appendix E, Section IV.C.1, as exempted, states, in part: “The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described.”

The associated guidance documents on which the NRC based its evaluation and acceptance of the proposed DAEC IOEP and associated EAL scheme are as follows:

- Revision 1 to NUREG-0654/FEMA-REP-1, which provides a common reference and guidance source for nuclear facility operators to develop radiological emergency response plans.

- Office of Nuclear Security and Incident Response / Division of Preparedness and Response (NSIR/DPR) Interim Staff Guidance (ISG) – 2, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants" (Reference 10), which provides guidance for the review of permanently defueled emergency plans for power reactor sites undergoing decommissioning.

- NUREG-2215, "Standard Review Plan for Spent Fuel Dry Storage Systems and Facilities" (Reference 11), which provides emergency plan review guidance applicable to facilities licensed pursuant to the regulatory requirements found in 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste."

- Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors" (Reference 12), which was endorsed by the NRC in a letter dated March 28, 2013 (Reference 13), as generic (non-plant-specific) EAL scheme development guidance.

3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the licensee's regulatory and technical analyses in support of its proposed emergency plan changes, as described in the application dated June 28, 2021, as supplemented by letter dated December 16, 2021. The technical evaluation is detailed below.

3.1 Background

By letter dated April 28, 2021 (Reference 14), the NRC issued Amendment No. 313 to Renewed Facility Operating License No. DPR-49 approving the DAEC PDEP and Permanently Defueled EAL scheme. By email dated June 10, 2021 (Reference 15), NEDA informed the NRC that the PDEP and Permanently Defueled EAL scheme would be fully implemented on June 11, 2021.

3.2 Proposed Changes

In its application dated June 28, 2021, as supplemented by letter dated December 16, 2021, NEDA requested that the NRC review and approve a proposed DAEC IOEP, which included an ISFSI-Only EAL scheme based on the applicable guidance in NEI 99-01, Revision 6. The proposed amendment would replace the existing DAEC PDEP and associated Permanently Defueled EAL scheme. Specifically, the proposed changes would modify the scope of onsite emergency preparedness measures to reflect the reduced potential for radiological accidents with all spent fuel in dry cask storage within the onsite ISFSI. The off-normal events and accidents addressed in the DAEC IOEP are related to the dry cask storage of spent nuclear fuel at the ISFSI and include only off-normal, accident, natural phenomena, and hypothetical events and consequences affecting the DAEC ISFSI.

The major changes that NEDA is requesting are: (1) removal of the various emergency actions related to the SFP; (2) removal of non-ISFSI related emergency event types; (3) clarifying definitions for security EALs; (4) revision of the Emergency Response Organization (ERO); and (5) identification of the "ISFSI Shift Supervisor" title as the position that assumes the Emergency Director responsibilities following an emergency declaration.

Under the DAEC PDEP with spent fuel stored within the SFP, the most severe postulated beyond-design-basis accident involved a highly unlikely sequence of events that causes a heat-up of the spent fuel, postulated to occur without heat transfer, such that the zirconium alloy fuel cladding reaches ignition temperature. While this scenario was shown to be highly improbable based on NEDA's calculations in support of the PDEP, as verified by the NRC staff, the resultant zirconium alloy fire could potentially lead to the release of fission products to the atmosphere. However, after removal of the spent fuel from the DAEC SFP, the accident scenarios and analyses demonstrate that the age and configuration of spent fuel stored in dry cask storage precludes the possibility of such a zirconium alloy fire scenario. As such, because the spent fuel has been transferred to dry cask storage within the onsite DAEC ISFSI, the number and severity of potential radiological accidents is now significantly less than when spent fuel was stored in the SFP. For these reasons, the potential radiological consequences of accidents possible at DAEC are further reduced.

There continues to be no need for formal offsite radiological emergency preparedness plans under 44 CFR Part 350, "Review and Approval of State and Local Radiological Emergency Plans and Preparedness," at DAEC because no design-basis accident or reasonably credible beyond-design-basis accident can result in radioactive releases that exceed the U.S. Environmental Protection Agency (EPA) early phase protective action guides (PAGs) (Reference 16) beyond the exclusion area boundary.

3.3 Evaluation

The NRC staff reviewed the changes from the current DAEC PDEP and associated Permanently Defueled EAL scheme to the proposed IOEP and EAL scheme, including the licensee's evaluation of the changes, to verify that the proposed IOEP and EAL scheme continue to meet the standards contained in 10 CFR 50.47(b), as well as the requirements of Appendix E to 10 CFR Part 50, as exempted, for the long-term defueled condition at DAEC.

The NRC staff also performed a review to ensure that the proposed IOEP would be consistent with the requirements of 10 CFR 72.32(a). Although the requirements of 10 CFR 72.32(a) do not apply to a 10 CFR Part 50 licensee, such as DAEC, the NRC examined these regulations to promote consistency in the emergency planning requirements between a specific license (Part 72) ISFSI and general license (Part 50) ISFSI. These requirements, and their applicability to facilities licensed under 10 CFR Part 72, are further described in NUREG-2215.

3.3.1 *Elimination of SFP Initiation Conditions and EALs*

Because the spent fuel is removed from the DAEC SFP, there is no longer any potential for the accidents previously described in the PDEP associated with SFP operations that would increase risk to the health and safety of the public. These accidents included events specifically related to the storage of the fuel in the SFP. In its application, as supplemented, NEDA provided that the off-normal events and accidents addressed in the IOEP are related to the dry cask storage of spent nuclear fuel within the onsite ISFSI and include only the off-normal, accident, natural phenomena, and hypothetical events and consequences presented in the NUHOMS Updated

Final Safety Analysis Report (Reference 17). Because the spent fuel from the DAEC SFP has been transferred to dry cask storage within the onsite ISFSI, the spent fuel storage and handling systems associated with the SFP will be removed from operation. Therefore, accident conditions associated with the DAEC SFP are no longer applicable.

The initiating conditions (ICs) and EALs associated with the emergency classification levels in the current PDEP are based on Appendix C, "Permanently Defueled Station ICs/EALs," to NEI 99-01, Revision 6, which addresses a nuclear power reactor that has permanently ceased operations and transferred spent fuel from the reactor vessel to the SFP (permanently defueled). Because the spent fuel has been removed from the SFP and placed in dry cask storage within the onsite ISFSI, the ICs and EALs in Appendix C to NEI 99-01, Revision 6, which are associated with the SFP at a decommissioning facility, are no longer required. Additionally, certain ICs and EALs, whose primary function is not associated with the SFP, are no longer required when administrative controls are established to limit source term accumulation and the offsite consequences of uncontrolled effluent releases.

Examples of administrative controls for radiological source term accumulation limits and methods to control the accidental dispersal of the radiological source are:

- radioactive materials collected on filter media and resins (dose rate limit)
- contaminated materials collected in shipping containers (dose rate limit)
- surface or fixed contamination on work areas that may create airborne radioactive material (activity limits)
- radioactive liquid storage tank(s) (activity concentration limits)

Examples of potential methods to control accidental dispersal of the radiological source term include limits on dispersal mechanisms that may cause a fire (e.g., limits on combustible material loading, use of a fire watch to preclude fires, etc.) or placement of a berm around a radioactive liquid storage tank. If the dispersal control fails, the limits on source term would preclude exceeding the site boundary source term limit.

Other ICs proposed for deletion include those associated with the SFP mitigative strategies contained in certain NEDA license conditions, as well as response procedures for potential or actual aircraft attacks. The NRC staff has previously maintained EALs for potential or actual aircraft threats for facilities transitioning into decommissioning with spent fuel stored in an SFP, as well as maintaining the mitigative strategies license conditions. These will be eliminated now that the spent fuel was removed from the SFP and is in dry cask storage within the onsite ISFSI.

The proposed deletions of ICs from the ISFSI-only EAL scheme for DAEC are shown in strikeout in the table below. The deletions are appropriate because either (1) the ICs are associated solely with DAEC SFP operations, or (2) for those ICs whose primary function is not associated with the SFP, sufficient administrative controls to limit possible effluent releases have been established. The ICs and EALs being deleted in their entirety include all ICs and EALs associated with the categories of abnormal radioactivity release and system malfunction, as these two categories apply only to SFP operation.

Emergency Plan Initiating Conditions Being Deleted

UNUSUAL EVENT	ALERT
~~**PD-RU1** Release of gaseous or liquid radioactivity greater than 2 times the ODCM [offsite dose calculation manual] limits for 60 minutes or longer.~~	~~**PD-RA1** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRem TEDE [Total Effective Dose Equivalent] or 50 mRem thyroid CDE [committed dose equivalent].~~
~~**PD-RU2** UNPLANNED rise in plant radiation levels.~~	~~**PD-RA2** UNPLANNED rise in plant radiation levels that impedes facility access required to maintain spent fuel integrity.~~
PD-HU1 Confirmed SECURITY CONDITION or threat at the ISFSI.	**PD-HA1** HOSTILE ACTION within the OWNER CONTROLLED AREA ~~or airborne attack threat within 30 minutes.~~
~~PD-HU2 Hazardous Events affecting equipment necessary for spent fuel cooling.~~ [1]	
~~PD-SU1 UNPLANNED SFP temperature rise~~	

[1] ~~For a facility in which all spent fuel is stored in the ISFSI, the conditions addressed in PD-HU2 remain fully addressed by IC E-HU1.~~

The ICs listed in the table below will be retained since they remain appropriate to address an event related to an ISFSI-only facility (i.e., no spent fuel stored in the SFP).

ISFSI-Only Emergency Plan Initiating Conditions

UNUSUAL EVENT	ALERT
ISFSI	
E-HU1 Damage to a loaded cask CONFINEMENT BOUNDARY.	
Hazards and Other Conditions	
PD-HU1 Confirmed SECURITY CONDITION or threat at the ISFSI.	**PD-HA1** HOSTILE ACTION within the OWNER CONTROLLED AREA.
PD-HU3 Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT.	**PD-HA3** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT.

The most severe beyond-design-basis accident postulated for DAEC with spent fuel stored within the SFP involved a highly unlikely sequence of events that cause heat-up of the spent fuel, postulated to occur without heat transfer, such that the zirconium alloy fuel cladding reaches ignition temperature. Because this limiting, beyond-design-basis scenario is no longer possible now that the transfer of spent fuel from the DAEC SFP to dry cask storage in the onsite ISFSI has been completed, NEDA's assessment focused on the following design-basis accidents associated with the performance of decommissioning activities with all irradiated fuel stored in the DAEC ISFSI: (1) cask drop event (fuel related event); (2) radioactive waste handling event (resin liner drop); and (3) accidents initiated by external events.

As discussed in the April 13, 2021, exemptions from certain emergency planning requirements for DAEC, an analysis of the potential radiological impact of a design-basis accident at DAEC in a permanently defueled condition indicated that any releases beyond the exclusion area boundary were below the EPA early phase PAGs. The basis for these exemptions has not changed and remains in effect for the proposed ISFSI-only emergency plan changes.

For design-basis accidents (1) and (2) cited in the paragraph above, the results of the licensee's assessment indicate that the projected radiological doses at the exclusion area boundary continue to be less than the EPA early phase PAGs. The effects of accidents initiated by external events (3) cited above, such as fires, flood, wind (including tornadoes), earthquakes, lightning, and physical security breaches of the DAEC ISFSI that could affect the confinement boundary of the ISFSI, remain unchanged from the effects that were considered under the DAEC PDEP. The NRC staff examined the assumptions used in the licensee's IOEP analyses and verified that inputs were more conservative than those used in the approved PDEP, and therefore, determined that the associated accident analyses are sufficient to conclude that any releases beyond the exclusion area boundary will be below EPA early phase PAGs.

Because of the very low risk of consequences to public health and safety resulting from the postulated accidents related to the DAEC ISFSI, potential emergencies continue to be classified no higher than the Alert level in accordance with the requirements of Section IV.C.1 to Appendix E of 10 CFR Part 50, as exempted. Classification of emergencies at no higher than an Alert level also maintains consistency with the regulations in 10 CFR 72.32(a)(3), "Classification of accidents."

Based on the NRC staff's review of the proposed DAEC IOEP and associated EAL scheme, as described above, the NRC staff concludes that the planning standard at 10 CFR 50.47(b)(4), as well as the requirements of 10 CFR Part 50, Appendix E, Section IV.C.1, as exempted, pertaining to a standard emergency classification and action level scheme, are addressed in an acceptable manner in the IOEP, considering the permanently shut down and defueled status of the facility and the licensee's transfer of all remaining spent fuel from the DAEC SFP to dry cask storage within the onsite ISFSI.

3.3.2 *Emergency Response Organization Revision*

The existing DAEC PDEP provides for two ERO augmented positions: the Technical and Engineering Supervisor, and the Site Radiation Protection Coordinator. The proposed DAEC IOEP would replace these positions with two other positions: a Resource Manager, and an individual trained in radiological monitoring and assessment. The Resource Manager:

- will assist in assessing the event and obtaining needed resources
- will be in contact with the Emergency Director within two hours of declaration of an Unusual Event or an Alert classification level
- does not need to physically report to DAEC to perform the assigned responsibilities
- augments the Emergency Director by assisting in assessing the emergency condition and coordinating the required resources, including serving as the public information interface

Services provided to the Emergency Director by the Resource Manager can be provided remotely and do not necessitate an onsite response by the Resource Manager. By responding remotely, the actual response time is decreased (as compared to the ERO response required by

the DAEC PDEP) with no negative impact to services and functional responsibilities provided by the Resource Manager. The Resource Manager's functional responsibilities may be performed in a timely manner either by reporting to the site or performing the function remotely in the specified timeframe. In addition, NEDA proposes that, for a declared emergency involving radiological consequences, a minimum of one person trained in radiological monitoring and assessment will report to the DAEC ISFSI within four hours of the emergency declaration.

In its evaluation of the proposed changes to the DAEC ERO, the NRC staff considered the accident analysis referenced above, related to the deletion of EALs, either partially or in their entirety, as indicated, as they relate to SFP operation. Specifically, the NRC staff considered the postulated accidents that could occur with all spent fuel moved into dry cask storage within the onsite ISFSI, which pose a very low risk to public health and safety. The NRC staff notes that NEDA also continues to commit to maintain the appropriate level of augmented response to an emergency, including an event involving radiological consequences.

In the Statement of Considerations for the Final Rule for Emergency Planning Licensing Requirements for Independent Spent Fuel Storage Facilities and Monitored Retrievable Storage Facilities (MRS) (60 FR 32430; June 22, 1995), the Commission stated, in part:

> For there to be a significant environmental impact resulting from an accident involving the dry storage of spent nuclear fuel, a significant amount of the radioactive material contained within a cask must escape its packaging and enter the biosphere. There are two primary factors that protect the public health and safety from this event. The first is the design requirements for the cask that are imposed by regulation.
>
> These general design criteria place an upper bound on the energy a cask can absorb before the fuel is damaged. No credible dynamic events have been identified that could impart such significant amounts of energy to a storage cask after that cask is placed at the ISFSI.
>
> Additionally, there is a second factor which does not rely upon the cask itself but considers the age of the spent fuel and the lack of dispersal mechanisms. There exists no significant dispersal mechanism for the radioactive material contained within a storage cask.
>
> Based on the design limitations, the majority of spent fuel is cooled greater than 5 years. At this age, spent fuel has a heat generation rate that is too low to cause significant particulate dispersal in the unlikely event of a cask confinement boundary failure.

Although the NEDA's spent fuel analysis for DAEC has not been able to identify any design-basis accident that would result in a failure of the confinement barrier for the dry storage casks or the irradiated fuel itself, the IOEP nonetheless requires augmentation of one person trained in radiological monitoring and assessment, who will report to the site within four hours of the emergency declaration for an event involving radiological consequences.

The proposed DAEC IOEP also provides that additional personnel resources may be directed to report to DAEC to provide additional support, as needed, to assess radiological conditions, support maintenance and repair activities, develop and implement corrective action plans, and

assist with recovery actions. NEDA states that augmentation personnel are available from existing DAEC staff and can be requested from various contractors.

Based on the NRC staff's review of the DAEC IOEP and associated EAL scheme, as described above, the NRC staff concludes that planning standards 10 CFR 50.47(b)(1) and (b)(2), and the requirements of 10 CFR Part 50, Appendix E, Section IV.A, as exempted, pertaining to timely augmentation of response capabilities and coping with radiological emergencies, are addressed in an acceptable manner in the DAEC IOEP, considering the permanently shut down and defueled status of the facility and the transfer of all remaining spent fuel from the DAEC SFP to dry cask storage within the onsite ISFSI.

3.3.3 *Replacement of the "Shift Manager" with the "ISFSI Shift Supervisor"*

In Section 6.1, "On-Shift Positions," of the proposed DAEC IOEP, NEDA has reassigned several Emergency Director responsibilities from the Shift Manager to the ISFSI Shift Supervisor.

The non-delegable responsibilities of the ISFSI Shift Supervisor/Emergency Director include the following:

- classification of an event
- emergency notification approval (task of making the notifications may be delegated)
- authorization of radiation exposures in excess of 10 CFR Part 20 limits

Key delegable responsibilities of the ISFSI Shift Supervisor/Emergency Director include the following:

- notification of the emergency classification to the NRC, State, and County
- management of resources available to the facility
- coordination of mitigation actions
- coordination of corrective actions
- coordination of onsite protective actions
- decision to call for offsite assistance
- coordination of security activities
- termination of the emergency condition when appropriate
- performance of initial radiological assessment(s)
- maintenance of records of event activities

Section O, "Radiological Emergency Response Training," of the proposed DAEC IOEP provides the requirements for emergency preparedness training and identifies the level and the depth to which individuals are to be trained. The ISFSI Shift Supervisor/Emergency Director, Resource Managers, and augmented responders shall have training conducted on an annual basis such that proficiency is maintained on the topics listed below:

- Emergency Action Level classification
- radioactive release assessment
- Federal, State, and local notification procedures
- ERO augmentation
- emergency exposure control
- recovery

The NRC staff's evaluation verified the retitled position of the ISFSI Shift Supervisor is on-shift at the DAEC site 24 hours a day, 7 days a week, and serves as the senior management position during off-hours. This position assumes overall command and control of event response as the Emergency Director, and is responsible for monitoring conditions and approving all onsite activities. The proposed DAEC IOEP clearly identifies non-delegable responsibilities, along with other designated tasks, for the ISFSI Shift Supervisor/Emergency Director. The NRC staff considers this retitling activity to be an administrative change that will not impact the timing or performance of existing emergency response duties.

Based on the NRC staff's review of the DAEC IOEP, as described above, the NRC staff concludes that planning standards 10 CFR 50.47(b)(1) and (b)(2), pertaining to adequate staffing to provide initial facility accident response, are addressed in an acceptable manner in the IOEP. In addition, the requirements of 10 CFR Part 50, Appendix E, Section IV.A, as exempted, pertaining to the organization for coping with radiological emergencies being described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization, are addressed in an acceptable manner in the IOEP, considering the permanently shut down and defueled status of the facility and the transfer of all remaining spent fuel from the SFP to dry cask storage within the onsite ISFSI.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes reporting and administrative procedures or requirements. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding, which was published in the *Federal Register* on September 7, 2021 (86 FR 50190). The amendment meets the eligibility criteria for the categorical exclusion set forth in 10 CFR 51.22(c)(10)(ii). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Iowa State official was notified of the proposed issuance of the amendment on February 28, 2022. The State official had no comments.

6.0 CONCLUSION

Based on its review of the proposed DAEC IOEP and associated EAL scheme, the NRC staff finds that the proposed changes would continue to meet the applicable emergency planning standards in 10 CFR 50.47(b) and the requirements in Appendix E of 10 CFR Part 50, as exempted. The NRC staff finds continued reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the DAEC facility. In addition, the NRC staff concludes that the DAEC IOEP will be consistent with the emergency planning requirements for a specific license ISFSI under 10 CFR Part 72. Therefore, the NRC staff concludes that the licensee's proposed IOEP and associated EAL scheme in the letter dated June 28, 2021, as supplemented by letter dated December 16, 2021, are acceptable.

The NRC staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there continues to be reasonable assurance that such activities will be conducted in compliance with the 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 REFERENCES

1. Letter from NextEra Energy Duane Arnold, LLC to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations," dated January 18, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19023A196).

2. Letter from NextEra Energy Duane Arnold, LLC to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations," dated March 2, 2020 (ADAMS Accession No. ML20062E489).

3. Letter from NextEra Energy Duane Arnold, LLC to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations," dated August 27, 2020 (ADAMS Accession No. ML20240A067).

4. Letter from NextEra Energy Duane Arnold, LLC to U.S. Nuclear Regulatory Commission, "Certification of Permanent Removal of Fuel from the Reactor Vessel for Duane Arnold Energy Center," dated October 12, 2020 (ADAMS Accession No. ML20286A317).

5. Letter from NextEra Energy Duane Arnold, LLC to U.S. Nuclear Regulatory Commission, "License Amendment Request (TSCR-192): Independent Spent Fuel Storage Installation (ISFSI) Emergency Plan and Emergency Action Level Scheme," dated June 28, 2021 (ADAMS Accession No. ML21179A286).

6. Letter from NextEra Energy Duane Arnold, LLC to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information Relating to License Amendment Request (TSCR-192): Independent Spent Fuel Storage Installation (ISFSI) Emergency Plan and Emergency Action Level Scheme," dated December 16, 2021 (ADAMS Accession No. ML21350A097).

7. Letter from NextEra Energy Duane Arnold, LLC to U.S. Nuclear Regulatory Commission, "Registration of Independent Spent Fuel Installation Storage Cask and Notification of Permanent Removal of All Spent Fuel Assemblies from the Spent Fuel Pool," dated April 11, 2022 (ADAMS Accession No. ML22101A252).

8. Letter from U.S. Nuclear Regulatory Commission to NextEra Energy Duane Arnold, LLC, "Exemptions from Certain Emergency Planning Requirements and Related Safety Evaluation," dated April 13, 2021 (ADAMS Accession No. ML21097A141)

9. 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, dated November 1980 (ADAMS Accession No. ML040420012).

10. NSIR/DRP-ISG-2, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," dated May 11, 2015 (ADAMS Accession No. ML14106A057).

11. NUREG-2215, "Standard Review Plan for Spent Fuel Dry Storage Systems and Facilities," dated April 2020 (ADAMS Accession No. ML20121A190).

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

13. Letter from Mark Thaggard (U.S. Nuclear Regulatory Commission) to Susan Perkins-Grew (Nuclear Energy Institute), “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).

14. Letter from U.S. Nuclear Regulatory Commission to NextEra Energy Duane Arnold, LLC, “Issuance of Amendment No. 313 Regarding Changes to the Emergency Plan to Reflect the Permanently Defueled Condition and Make Changes to the Emergency Action Level Scheme,” dated April 28, 2021 (ADAMS Accession No. ML21098A166).

15. E-mail from Mike Davis (NextEra Energy Duane Arnold, LLC) to Marlayna Doell (U.S. Nuclear Regulatory Commission), “Notification of Implementation of Post-Defueled Emergency Plan,” dated June 10, 2021 (ADAMS Accession No. ML21165A121).

16. U.S. Environmental Protection Agency, “Protective Action Guide and Planning Guidance for Radiological Incidents,” dated January 2017 (EPA-400/R-17/001) (ADAMS Accession No. ML17044A073).

17. Letter from ORANO to U.S. Nuclear Regulatory Commission, “NUH-003, Updated Final Safety Analysis Report (UFSAR) for the Standardized NUHOMS® Horizontal Modular Storage System for Irradiated Nuclear Fuel, Revision 18,” dated January 22, 2019 (ADAMS Accession No. ML19028A061).

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Duane Arnold Energy Center - Issuance of Amendment No. 318 to Renewed Facility Operating License to Implement the Independent Spent Fuel Storage Installation Emergency Plan DATE April 25, 2022

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