



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

March 31, 2016

Mr. Thomas A. Vehec
Site Vice President
Next Era Energy
Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324-9785

SUBJECT: DUANE ARNOLD ENERGY CENTER – INTERIM STAFF RESPONSE TO
REEVALUATED FLOOD HAZARDS SUBMITTED IN RESPONSE TO
10 CFR 50.54(f) INFORMATION REQUEST – FLOOD-CAUSING MECHANISM
REEVALUATION (CAC NO. MF3683)

Dear Mr. Vehec:

The purpose of this letter is to provide a summary of the U.S. Nuclear Regulatory Commission (NRC) staff's assessment of the re-evaluated flood-causing mechanisms described in the March 10, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14072A017), flood hazard reevaluation report (FHRR) submitted by NextEra Energy Duane Arnold, LLC (the licensee) for Duane Arnold Energy Center (Duane Arnold), as well as supplemental information resulting from requests for additional information and audits.

By letter dated March 12, 2012, the NRC issued a request for information pursuant to Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (hereafter referred to as the 50.54(f) letter) (ADAMS Accession No. ML12053A340). The request was issued as part of implementing lessons-learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 2 to the 50.54(f) letter requested licensees to re-evaluate flood-causing mechanisms using present-day methodologies and guidance. Concurrently with the reevaluation of flooding hazards, licensees were required to develop and implement mitigating strategies in accordance with NRC Order EA-12-049, "Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12054A735). On March 30, 2015, the Commission provided Staff Requirements Memoranda (SRM) (ADAMS Accession No. ML15089A236) to COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards," dated November 21, 2014 (ADAMS Accession No. ML14309A256), affirming that licensees need to address the reevaluated flooding hazards within their mitigating strategies for beyond-design-basis external events.

The NRC staff has reviewed the information submitted by the licensee and has summarized the results of the review in the tables provided as an Enclosure to this letter. Table 1 provides the current design-basis flood hazard mechanisms. Table 2 provides the reevaluated flood hazard mechanisms; however, the reevaluated flood hazard mechanisms bounded by the current design-basis (Table 1) are not included.

The NRC staff has concluded that the licensee's reevaluated flood hazards information, as summarized in the Enclosure, is suitable for the assessment of mitigating strategies developed in response to Order EA-12-049 (i.e., defines the mitigating strategies flood hazard information described in Nuclear Energy Institute (NEI) guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide") for Duane Arnold. Further, the NRC staff has concluded that the licensee's reevaluated flood hazard information is a suitable input for other assessments associated with Near-Term Task Force Recommendation 2.1 "Flooding". The NRC staff plans to issue a staff assessment documenting the basis for these conclusions at a later time.

Revision 2 of NEI 12-06 includes a methodology to perform a Mitigating Strategies Assessment (MSA) with respect to the reevaluated flood hazards. On February 29, 2016, the NRC staff published Japan Lessons-Learned Division Interim Staff Guidance (ISG) JLD-ISG-2012-01, Revision 1, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (ADAMS Accession No. ML15357A142) in the *Federal Register* (81 FR 10283). This ISG endorses Revision 2 of NEI 12-06 (ADAMS Accession No. ML16005A625), dated December 2015. Based on the guidance provided in Revision 2 of the NEI 12-06 guidance document, flood event duration parameters and applicable flood associated effects should be considered as part of the Duane Arnold MSA. The NRC staff will evaluate the flood event duration parameters (including warning time and period of inundation) and flood-related associated effects developed by the licensee during the NRC staff's review of the MSA.

As stated above, Table 2 of the enclosure to this letter describes the reevaluated flood hazards that exceed the current design-basis. In order to complete its response to the information requested by Enclosure 2 to the 50.54(f) letter, the licensee is expected to submit an integrated assessment or a focused evaluation, as appropriate, to address these reevaluated flood hazards, as described in the NRC letter, "Coordination of Request for Information Regarding Flooding Hazard Reevaluation and Mitigating Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15174A257). This letter describes the changes in the NRC's approach to the flood hazard reevaluations that were approved by the Commission in its SRM to COMSECY-15-0019, "Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants" (ADAMS Accession No. ML15209A682).

T. Vehec

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If you have any questions, please contact me at (301) 415-6185 or e-mail at anthony.minarik@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Anthony Minarik", with a stylized flourish at the end.

Anthony Minarik, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-331

Enclosure:
Summary of Results of Flooding
Hazard Re-Evaluation Report

ENCLOSURE:

SUMMARY TABLES OF
REEVALUATED FLOOD HAZARD LEVELS

Table 1. Current Design Basis Flood Hazards for Use in the MSA

Mechanism	Stillwater Elevation	Waves/ Runup	Design Basis Hazard Elevation	Reference
Local Intense Precipitation	Not included in DB	Not included in DB	Not included in DB	FHRR Section 3.1
Streams and Rivers	764.1 ft MSL	2.9 ft	767.0 ft MSL	FSAR Section 2.4.3 & FHRR Section 3.9
Failure of Dams and Onsite Water Control/Storage Structures	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Section 3.3
Storm Surge	Not included in DB	Not included in DB	Not included in DB	FHRR Section 3.4
Seiche	Not included in DB	Not included in DB	Not included in DB	FHRR Section 3.5
Tsunami	Not included in DB	Not included in DB	Not included in DB	FHRR Section 3.6
Ice-Induced Flooding	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Section 3.7
Channel Migrations/Diversions	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Section 3.8

Note 1: Reported values are rounded to the nearest one-tenth of a foot.

Table 2. Reevaluated Flood Hazards for Flood-Causing Mechanisms for Use in the MSA

Mechanism	Stillwater Elevation	Waves/Runup	Reevaluated Hazard Elevation	Reference
Local Intense Precipitation				
Turbine Building - Door Location #124	758.0 ft MSL	Minimal	758.0 ft MSL	Email from Nextera Energy (ML16089A396)
Turbine Building - Door Location #136	758.2 ft MSL	Minimal	758.2 ft MSL	Email from Nextera Energy (ML16089A396)
Turbine Building - Door Location #137	758.2 ft MSL	Minimal	758.2 ft MSL	Email from Nextera Energy (ML16089A396)
Turbine Building - Door Location #154	758.0 ft MSL	Minimal	758.0 ft MSL	Email from Nextera Energy (ML16089A396)
Streams and Rivers				
Cool Season Flood	765.2 ft MSL	2.6 ft	767.8 ft MSL	Email from Nextera Energy (ML16089A396)

Note 1: The licensee is expected to develop flood event duration parameters and applicable flood associated effects to conduct the MSA. The staff will evaluate the flood event duration parameters (including warning time and period of inundation) and flood associated effects during its review of the MSA.

Note 2: Reevaluated hazard mechanisms bounded by the current design basis (see Table 1) are not included in this table

Note 3: Reported values are rounded to the nearest one-tenth of a foot.

If you have any questions, please contact me at (301) 415-6185 or e-mail at anthony.minarik@nrc.gov.

Sincerely,

/RA by Tekia Govan for/

Anthony Minarik, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-331

Enclosure:
Summary of Results of Flooding
Hazard Re-Evaluation Report

DISTRIBUTION:

PUBLIC	JLD R/F	RidsNRRJLD Resource
AMinarik, NRR	LQuinn-Willingham, NRO	RidsNroDsea Resource
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RidsRgn3MailCenter Resource	RidsNrrLASLent	RidsOgcMailCenter Resource
RidsOpaMail Resource	RidsAcrsAcnw_MailCtr Resource	CCook, NRO
ARivera-Varona, NRO	KErwin, NRO	ACampbell, NRO
MWillingham, NRO	MLee, NRO	BHarvey, NRO
MShams, NRR	RRivera-Lugo, NRO	

ADAMS Accession Nos.: PKG ML16084A767; LTR: ML16084A788; ENCL: ML16XXXXXXX *via email

OFFICE	NRR/JLD/JHMB/PM	NRR/JLD/LA	NRO/DSEA/RHM2/TR*	NRO/DSEA/RHM2/TM*
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DATE	3 /21/16	3 /24/16	3 /25/16	3 /30/16
OFFICE	NRO/DSEA/RHM2/BC*	NRR/JLD/JHMB/BC	NRR/JLD/JHMB/PM	
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DATE	3 /25/16	3 /30/16	3 /31/16	

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