



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

December 22, 2015

Mr. Louis Cortopassi  
Site Vice President and Chief  
Nuclear Officer  
Omaha Public Power District  
Fort Calhoun Station  
Mail Stop FC-2-4  
9610 Power Lane  
Blair, NE 68008

SUBJECT: FORT CALHOUN STATION, UNIT 1– INTERIM STAFF RESPONSE TO  
REEVALUATED FLOOD HAZARDS SUBMITTED IN RESPONSE TO  
10 CFR 50.54(f) INFORMATION REQUEST – FLOOD-CAUSING MECHANISM  
REEVALUATION (TAC NO. MF4711)

Dear Mr. Cortopassi:

The purpose of this letter is to provide a summary of the U.S. Nuclear Regulatory Commission (NRC) staff's assessment of the reevaluated flood-causing mechanisms described in the February 4, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15042A127), flood hazard reevaluation report (FHRR) submitted by Omaha Public Power District (the licensee) for Fort Calhoun Station, Unit 1 (Fort Calhoun), 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 reevaluate 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.

**Enclosure two transmitted herewith contains Security-Related Information. When separated from the Enclosure, this document is decontrolled.**

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- 2 -

The NRC staff has reviewed the information submitted by the licensee and has summarized the results of the review in the tables provided as Enclosure 1 to this letter. Table 1 provides the current design-basis flood hazard mechanisms. Table 2 provides reevaluated flood hazard mechanisms; however, reevaluated hazard mechanisms bounded by the current design-basis (Table 1) are not included. Because Table 2 includes security-related information, Enclosure 1 contains the redacted version of Table 2. Enclosure 2 is withheld from public disclosure and restores the security-related information to Table 2.

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 guidance documents currently being finalized by the industry and NRC staff) for Fort Calhoun. 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.

In addition, Nuclear Energy Institute (NEI) guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" is currently being revised. This revision will include a methodology to perform a Mitigating Strategies Assessment (MSA) with respect to the reevaluated flood hazards. Once this methodology is endorsed by the NRC, flood event duration parameters and applicable flood associated effects should be considered as part of the Fort Calhoun 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).

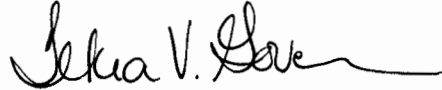
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- 3 -

If you have any questions, please contact me at (301) 415-6197 or e-mail at [tekia.govan@nrc.gov](mailto:tekia.govan@nrc.gov).

Sincerely,



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

Docket No. 50-285

Enclosures:

1. Summary of Results of Flooding Hazard  
Re-Evaluation Report (Redacted Version)
2. Summary of Results of Flooding Hazard  
Re-Evaluation Report (Non-Public Version)

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ENCLOSURE 1:  
SUMMARY TABLES OF  
REEVALUATED FLOOD HAZARD LEVELS

**Table 1. Current Design Basis Flood Hazards for Use in the MSA<sup>1</sup>**

<b>Mechanism</b>	<b>Stillwater Elevation</b>	<b>Waves/Runup</b>	<b>Design Basis Hazard Elevation</b>	<b>Reference</b>
<b>Local Intense Precipitation</b>	Not included in DB	Not included in DB	Not included in DB	FHRR Table 3.14-1
<b>Streams and Rivers</b> Missouri River	1,014.5 ft NAVD88	Not applicable	1,014.5 ft NAVD88	FHRR Table 3.14-1
<b>Failure of Dams and Onsite Water Control/Storage Structures</b> [Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
<b>Storm Surge</b>	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Table 3.14-1
<b>Seiche</b>	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Table 3.14-1
<b>Tsunami</b>	No Impact on the Site Identified	No Impact on the Site Identified	No Impact on the Site Identified	FHRR Table 3.14-1
<b>Ice-Induced Flooding</b>	Not included in DB	Not included in DB	Not included in DB	FHRR Table 3.14-1
<b>Channel Migrations/Diversions</b>	Not included in DB	Not included in DB	Not included in DB	FHRR Table 3.14-1

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<sup>1,2,3</sup>**

Mechanism	Stillwater Elevation	Waves/Runup	Reevaluated Hazard Elevation	Reference
<b>Local Intense Precipitation</b>				
Zone A	1,006.0 ft NAVD88	Minimal	1,006.0 ft NAVD88	FHRR Table 3.14-1
<b>Streams and Rivers</b>				
Main Building Complex 1	1,010.4 ft NAVD88	8.1 ft	1,018.5 ft NAVD88	FHRR Table 2.2-13
Main Building Complex 2	1,010.3 ft NAVD88	7.9 ft	1,018.2 ft NAVD88	FHRR Table 2.2-13
Main Building Complex 3	1,010.4 ft NAVD88	9.0 ft	1,019.4 ft NAVD88	FHRR Table 2.2-13
Main Building Complex 4	1,010.6 ft NAVD88	4.3 ft	1,014.9 ft NAVD88	FHRR Table 2.2-13
ISFSI	1,010.6 ft NAVD88	3.4 ft	1,014.0 ft NAVD88	FHRR Table 2.2-13
<b>Failure of Dams and Onsite Water Control/Storage Structures<sup>3</sup></b>				
[Redacted] <sup>4</sup>	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	----- Note 5 -----			
[Redacted]	----- Note 5 -----			
[Redacted]	----- Note 5 -----			

**Table 2. Reevaluated Flood Hazards for Flood-Causing Mechanisms for Use in the MSA<sup>1,2,3</sup>**

Mechanism	Stillwater Elevation	Waves/ Runup	Reevaluated Hazard Elevation	Reference
[Redacted]	----- Note 5 -----			
[Redacted]	----- Note 5 -----			
[Redacted]	----- Note 5 -----			
<b>Ice-Induced Flooding</b>	1,006.1 ft NAVD88	Not applicable	1,006.1 ft NAVD88	FHRR Table 3.14-1
<b>Channel Migration/Diversion</b>	----- Note 6 -----			FHRR Sections 2.8 and 3.8

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

Note 2: Reported values are rounded to the nearest one-tenth of a foot.

Note 3: 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 4: Flood height informed by use of 2-D model.

Note 5: The licensee is expected to update and submit these scenarios to the NRC by September 30, 2016, because evaluations of these scenarios using the 2-D model are not available. Reevaluated flood elevations using the 2-D model are expected to be bounded by the elevation from the [Redacted] Failure. However, the associated effects and flood event durations will differ from the [Redacted] Failure scenario and should be separately evaluated and provided in the September 30, 2016 submittal.

Note 6: Channel Migration/Diversion is dependent on the results of Streams and Rivers, Failure of Dams, and Onsite Water Control/Storage Structures scenarios in Table 2. It is expected that the water elevations for Channel Migration/Diversion would be bounded by these associated scenarios, however the associated effects may be different. The licensee is expected to complete the evaluation for Channel Migration/Diversion, including the associated effects, and provided the results in the September 30, 2016 submittal.

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- 3 -

If you have any questions, please contact me at (301) 415-6197 or e-mail at tekia.govan@nrc.gov.

Sincerely,

/RA/

Tekia Govan, Project Manager  
Hazards Management Branch  
Japan Lessons-Learned Division  
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Docket No. 50-285

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1. Summary of Results of Flooding Hazard Re-Evaluation Report (Redacted Version)
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ADAMS Accession Nos.: PKG ML15355A099; LTR: ML15355A087; ENCL 1: ML15349A931 (PUBLIC); ENCL 2: ML15349A926 (NON-PUBLIC) \*via email

OFFICE	NRR/JLD/JHMB/PM	NRR/JLD/LA	NRO/DSEA/RHM1/TR*	NRO/DSEA/RHM1/TL*
NAME	TGovan	SLent	KSee	KErwin
DATE	12/21/2015	12/21/2015	12/17/2015	12/17/2015
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NAME	MShams	TGovan		
DATE	12/21/2015	12/22/2015		

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