



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

November 26, 2013

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2: REQUEST FOR
ADDITIONAL INFORMATION REGARDING FUKUSHIMA LESSONS
LEARNED – FLOODING HAZARD REEVALUATION REPORT (TAC NOS.
MF1106 AND MF1107)

Dear Mr. Heacock:

By letter dated March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a request for additional information (RAI) pursuant to Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (hereafter referred to as the 50.54(f) letter). The request was issued as a 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 perform a flood hazard reevaluation using present-day methodologies and guidance.

By letter dated March 11, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13074A925), Virginia Electric and Power Company (Licensee) submitted a response to Enclosure 2, Required Response 2 of the 50.54(f) letter. The NRC staff has determined that additional information is needed to complete its review.

A response to the enclosed RAI is needed before the NRC staff can complete the review. This request was discussed with Mr. Tom Shaub of your staff on November 13, 2013, and it was agreed that licensee would respond within 30 days of the issuance of the draft RAI e-mail. The e-mail was sent on November 14, 2013. Should you have any questions, please me at 301-415-2597.

Sincerely,

A handwritten signature in black ink, appearing to read "V. Sreenivas".

V. Sreenivas, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosure: Request for Additional Information

cc w/encl: Distribution via Listserv

INTERIM STAFF EVALUATION AND REQUEST FOR ADDITIONAL INFORMATION

FUKUSHIMA LESSONS LEARNED

FLOODING HAZARD REEVALUATION REPORT

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-338 AND 50-339

RAI No. 3.2-1, LIP Flooding:

The licensee is requested to provide high resolution, digital versions of Figures 2.1-1 through 2.1-4 as these figures are important in understanding the direction and boundary of subbasin flows.

RAI No. 3.2-2, LIP Flooding:

The licensee is requested to provide electronic versions of the input files used for HEC-HMS and HEC-RAS modeling in the local intense precipitation analyses.

RAI No. 3.2-3, LIP Flooding:

The licensee is requested to provide a description of the methods used to incorporate elevation measurements and the magnitude of the elevation uncertainty in the local intense precipitation analyses. Discuss the related uncertainty associated with the onsite flood level estimates.

RAI No. 3.2-4, LIP Flooding:

The licensee is requested to discuss roof drainage features (e.g., scuppers, gutter outlets, etc.) for plant buildings, and how runoff from these drainage features are incorporated into the HEC-HMS modeling in the local intense precipitation flood analyses.

RAI No. 3.2-5, LIP Flooding:

The licensee is requested to discuss how the vehicle barrier system was incorporated in the HEC-HMS modeling in the local intense precipitation analyses.

RAI No. 3.3-1, Stream and River Flooding:

The licensee is requested to provide electronic versions of the input files used for HEC-HMS modeling in the flooding of rivers and streams analyses.

RAI No. 3.4-1, Dam Failure Flooding:

Standard Review Plan Section 2.4.4 states: "If any onsite water control or storage structures exist above the site grade, failures of these from any cause should be determined and the potential for flooding of SSC important to safety and doors and openings identified." Consistent with this statement, staff requests the following information related to potential site flooding

Enclosure

caused by a failure of the service water reservoir impoundment discussed in Section 2.3.4 of the licensee's FHRR:

- A. In Section 2.3.4 of the Flooding Hazard Reevaluation Report (FHRR), the licensee states that the service water reservoir dike is a "Seismic Class I structure, and has been evaluated to preclude overtopping, piping, slide and other sources of failure." The licensee is requested to describe the evaluation(s) performed for plausible failure causes (i.e., hydrologic, seismic, and sunny-day failure modes) for the service water reservoir impoundment and, if applicable, provide an evaluation of subsequent site flooding using a hierarchical framework. Specifically, the licensee is requested to provide evaluations of failure mechanisms consistent with using present-day guidance, methods, and data, including:
1. evaluation of the potential for seismically-induced failure under site-specific seismic hazards defined using present-day guidance and methods,
 2. evaluation of the potential for hydrologically-induced failure (e.g., overtopping) under the local intense precipitation events applicable to the site, and
 3. evaluation of the potential for sunny-day failure.

If crediting existing evaluations, the licensee is requested to provide justification that existing evaluations are consistent with present-day guidance, methods, and data or bounding of flood hazards that would result from an evaluation based on present day guidance, methods, and data. The licensee is requested to: (1) describe the models and assumptions that were used in the evaluations and (2) provide an explanation of the consistency of these evaluations with present-day guidance and methods as well as current data. If the consequences (i.e., floods) from any of these failure modes is judged not to affect the site, the license is requested to provide a justification for this conclusion, including a description of pertinent evaluations, models, and assumptions.

- B. Section 2.3.4 of the FHRR describes an emergency dike and intercepting trench capable of diverting water from a failure of the service water reservoir impoundment. The licensee is requested to provide a detailed description of the site's topographic or flow division features, including maps showing their location. In addition, the licensee is requested to provide an evaluation of the effectiveness of dike/trench systems (including the potential for erosion and sedimentation) following failure of the service water reservoir impoundment under the plausible failures modes. The licensee is requested to describe the models and assumptions that were used in the evaluations.

RAI No. 4.0-1, Integrated Assessment:

The March 12, 2012, 50.54(f) letter, Enclosure 2, requests the licensee to perform an integrated assessment of the plant's response to the reevaluated hazard if the reevaluated floods hazard is not bounded by the current design basis. The licensee is requested to provide the applicable

flood event duration parameters (see definition and Figure 6 of the Guidance for Performing an Integrated Assessment, JLD-ISG-2012-05) associated with mechanisms that trigger an Integrated Assessment. This includes (as applicable) the warning time the site will have to prepare for the event, the period of time the site is inundated, and the period of time necessary for water to recede off the site for the mechanisms that are not bounded by the current design basis. The licensee is also requested to provide a basis for the flood event duration parameters. The basis for warning time may include information from relevant forecasting methods (e.g., products from local, regional, or national weather forecasting centers).

November 26, 2013

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2: REQUEST FOR ADDITIONAL INFORMATION REGARDING FUKUSHIMA LESSONS LEARNED – FLOODING HAZARD REEVALUATION REPORT (TAC NOS. MF1106 AND MF1107)

Dear Mr. Heacock:

By letter dated March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a request for additional information (RAI) pursuant to Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (hereafter referred to as the 50.54(f) letter). The request was issued as a 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 perform a flood hazard reevaluation using present-day methodologies and guidance.

By letter dated March 11, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13074A925), Virginia Electric and Power Company (Licensee) submitted a response to Enclosure 2, Required Response 2 of the 50.54(f) letter. The NRC staff has determined that additional information is needed to complete its review.

A response to the enclosed RAI is needed before the NRC staff can complete the review. This request was discussed with Mr. Tom Shaub of your staff on November 13, 2013, and it was agreed that licensee would respond within 30 days of the issuance of the draft RAI e-mail. The e-mail was sent on November 14, 2013. Should you have any questions, please me at 301-415-2597.

Sincerely,
/RA/
V. Sreenivas, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339
Enclosure: Request for Additional Information
cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC
LPL2-1 Reading
RidsAcrsAcnw_MailCTR Resource
RidsNrrDorLpl2 Resource
RidsNrrDssSbpb Resource
RidsNrrLASFiguroa Resource

RidsNrrPMNorthAnna Resource
RidsRgn2MailCenter Resource
RKuntz, NRO
CCook, NRO
EMiller, NRR

ADAMS Accession No.: ML13325B122

***via email**

OFFICE	NRR/DORL/LPL2-1/PM	NRR/DORL/LPL2-1/LA	NRO/DSEA/RHMB/BC*
NAME	VSreenivas	SFiguroa	CCook
DATE	11/20/13	11/25/13	11/13/13
OFFICE	NRR/DORL/LPL2-1/BC	NRR/DORL/LPL2-1/PM	
NAME	RPascarelli	VSreenivas	
DATE	11/26/13	11/26/13	

OFFICIAL RECORD COPY

Mr. David A. Heacock
 President and Chief Nuclear Officer
 Virginia Electric and Power Company
 5000 Dominion Boulevard
 Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2: REQUEST FOR ADDITIONAL INFORMATION REGARDING FUKUSHIMA LESSONS LEARNED – FLOODING HAZARD REEVALUATION REPORT (TAC NOS. MF1106 AND MF1107)

Dear Mr. Heacock:

By letter dated March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a request for additional information (RAI) pursuant to Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (hereafter referred to as the 50.54(f) letter). The request was issued as a 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 perform a flood hazard reevaluation using present-day methodologies and guidance.

By letter dated March 11, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13074A925), Virginia Electric and Power Company (Licensee) submitted a response to Enclosure 2, Required Response 2 of the 50.54(f) letter. The NRC staff has determined that additional information is needed to complete its review.

A response to the enclosed RAI is needed before the NRC staff can complete the review. This request was discussed with Mr. Tom Shaub of your staff on November 13, 2013, and it was agreed that licensee would respond within 30 days of the issuance of the draft RAI e-mail. The e-mail was sent on November 14, 2013. Should you have any questions, please me at 301-415-2597.

Sincerely,

V. Sreenivas, Project Manager
 Plant Licensing Branch II-1
 Division of Operating Reactor Licensing
 Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339
 Enclosure: Request for Additional Information
 cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC
 LPL2-1 Reading
 RidsAcrsAcnw_MailCTR Resource
 RidsNrrDorLpl2 Resource
 RidsNrrDssSbpb Resource
 RidsNrrLASFiguroa Resource

RidsNrrPMNorthAnna Resource
 RidsRgn2MailCenter Resource
 RKuntz, NRO
 CCook, NRO
 EMiller, NRR

ADAMS Accession No.: ML13325B122

*via email

OFFICE	NRR/DORL/LPL2-1/PM	NRR/DORL/LPL2-1/LA	NRO/DSEA/RHMB/BC*
NAME	VSreenivas	SFiguroa SF	CCook
DATE	11/20/13	11/25/13	11/13/13
OFFICE	NRR/DORL/LPL2-1/BC	NRR/DORL/LPL2-1/PM "	
NAME	RPascarelli RSP	VSreenivas VJ	
DATE	11/26/13		11/26/13