



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

September 26, 2011

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

SUBJECT: NORTH ANNA POWER STATION, UNIT NOS. 1 AND 2, REQUEST FOR
INFORMATION REGARDING THE EARTHQUAKE OF AUGUST 23, 2011
(TAC NOS. ME7050 AND ME7051)

Dear Mr. Heacock:

A public meeting was held between the Virginia Electric and Power Company and the Nuclear Regulatory Commission (NRC) staff on September 8, 2011, to discuss the earthquake that occurred near the North Anna Power Station (NAPS) on August 23, 2011, and an NRC request for information was issued on September 14, 2011, on that topic. On September 17, 2011, you submitted the report, "Virginia Electric and Power Company (Dominion) North Anna Power Station, Units 1 and 2, North Anna Independent Spent Fuel Storage Installation Summary Report of August 23, 2011, Earthquake Response and Restart Readiness Determination Plan" (Agencywide Documents Access and Management System Accession No. ML11262A151). This letter forwards the staff's request for information on additional topics. Your most expeditious response is requested to enable the staff to continue its review of your proposed plans for restarting the NAPS.

Sincerely,

A handwritten signature in black ink, appearing to read "Meena Khanna", is located below the "Sincerely," text.

Meena Khanna
Lead of North Anna Restart Team
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosure:
Request for Information

cc w/encl: Distribution via Listserv

REQUEST FOR INFORMATION

VIRGINIA ELECTRIC AND POWER COMPANY (VEPCO)

NORTH ANNA POWER STATION, UNIT NOS. 1 AND 2 (NAPS)

DOCKET NOS. 50-338 AND 50-339

The following requests for information are related to the earthquake of August 23, 2011, that occurred in the vicinity of the North Anna Power Station, Unit Nos. 1 and 2 (NAPS), as discussed in the public meeting held by the Nuclear Regulatory Commission (NRC) staff on September 8, 2011 and communicated to the NRC in a letter dated September 17, 2011, (ADAMS Accession No. ML11262A151).

Heating, Ventilation and Air Conditioning

1. Provide the basis for concluding that the bypass leakage of the safety-related charcoal filters meets technical specifications.
2. Provide the basis for concluding that the control room in-leakage remains less than assumed in the control room habitability dose analysis.

Containment

1. Explain how VEPCO has re-established operability of the containment.
2. Explain whether VEPCO has performed analyses of the stresses, specifically of the containment structures.
3. What were the results? If analyses were not performed, discuss why such analyses are not needed prior to restart.
4. Confirm whether VEPCO performed inservice testing on containment isolation valves during the shutdown. List the valves tested and provide the results.
5. Confirm whether VEPCO performed a general visual inspection of the containment consistent with Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix J and industry guidance in Nuclear Energy Institute document NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," and American National Standards Institute/American Nuclear Society document ANSI/ANS 56.8, "Containment System Leakage Testing Requirements" as referenced in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program"? If performed, provide the results. If not performed, list the containment inspections performed and provide the results.

Enclosure

Electrical

1. Explain how VEPCO has determined that all electrical equipment, including electrical equipment that was commercially dedicated by the licensee, as well as the safety-related batteries, required to function during and following a seismic event (operating basis earthquake and safe shutdown earthquake (OBE/SSE)), remains qualified to perform their required safety-functions during all design basis events.
2. Explain how VEPCO has determined that electrical connections (i.e., electrical bus bars (power and control cable and wiring connections at all voltage levels), battery, contactors, etc.) maintained their electrical connection integrity to perform their required safety-functions under both normal and accident conditions and also during and following another seismic event (OBE or SSE).
3. Explain how VEPCO has determined that support features associated with bus bars, battery racks, switchgear, cable raceways, containment electrical penetration assemblies, etc., are adequate to enable electrical equipment to perform their required safety-functions under both normal and accident conditions and also during and following another seismic event (OBE or SSE).
4. Explain how VEPCO has evaluated the emergency diesel generator and the support systems (cooling water, starting air and fuel oil) to ensure maintenance of their required safety-functions during all design-basis events.
5. Explain how electrical systems were declared operable including any integrated tests performed. Was any maintenance or operator action required following the seismic event to restore the integrity of any equipment required for plant safe shutdown?
6. Explain how VEPCO has determined that the neutron flux instrumentation functioned in accordance with the design requirement and that the trip was valid.
7. Regarding the NAPS dual-unit trips, how did VEPCO determine that the offsite power system has adequate capacity and capability to mitigate all design-basis events and that the degraded voltage setpoints are adequate.

Instrumentation and Controls (I&C)

1. The staff understands that VEPCO has been examining all unusual spurious change-of-states of I&C and electrical equipment that impacted the sequence-of-events recorders and other post-trip review logs from the August 23, 2011, event, and that the NRC staff Augmented Inspection Team members are evaluating the licensee's actions in thoroughly investigating the root causes of unexpected equipment performance in this area. Describe how these unexpected instrumentation issues were resolved.
2. The licensee's presentation to the NRC staff on September 8, 2011, identified that "comprehensive surveillance testing to validate SSC [structures, systems, and components] operability/performance" (448 surveillance tests) will be performed. The staff would like to understand the basis for selection of the particular I&C-related surveillance tests that are scheduled to be performed (or were performed) and whether the licensee has identified any

additional acceptance criteria for such testing that may require additional field confirmations or additional test steps to be performed during such surveillance testing.

For example, some reactor trip system and engineered safety feature periodic functional testing is performed without including the local transmitter in the loop, and some locally mounted instrumentation devices have flexible conduit connections. Should these connections be subjected to seismic acceleration in key natural frequencies of the flexible section that are in excess of design-basis conditions, the additional stress put on the instrument terminals could weaken the electrical connections at the terminal strips of the devices, which could result in momentary disruption of the signal, but not permanent disruption that would manifest itself under the static conditions normally present during a periodic surveillance test.

- a. Describe how potentially loose electrical and/or mechanical connections were addressed.
 - b. Describe how the verification of the safety related instrumentation (especially mechanical instrumentation) calibration remained within the specification limits was performed.
 - c. Describe how verification that safety related instrumentation channel response times remained within the specification limits was performed (especially the settings of mechanically-based instrumentation devices and relays, e.g., Agastat time delay relays, resulting in a total channel response time that could exceed analyzed event response time requirements)
3. The staff requests the licensee to confirm that the plans for start-up testing of each unit include confirmation of proper operation of non-safety, but important to safety control systems, such as would be performed as elements of the pre-operational and power ascension testing described within Appendix A to Revision 3 of 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants," to verify proper operability of the normal (nonsafety related) plant control systems (e.g., feedwater control, rod control, pressurizer level and pressure controls, secondary system steam pressure control system, main turbine and feedwater pump turbine control systems, in-core instrumentation, plant annunciator and process computer systems, seismic instrumentation system, plant instrumentation grounding system, etc.).
- a. Confirm which nonsafety but important-to-safety plant systems were identified by the licensee as critical to the safe operation of the plant.
 - b. Confirm what pre-operational testing has been selected to confirm proper operability of these systems prior to startup.
 - c. Identify the sequence of testing and administrative controls that will be utilized during the planned power ascension during restart to ensure that such systems are properly operating before increasing to the next power level.

Fire Protection

1. Describe how VEPCO has verified or confirmed the functionality following the earthquake of the fire protection SSCs, both passive and active, that are credited in the NAPS approved fire protection program or are relied upon to ensure safe shutdown in the event of a fire.
2. Describe plant staff activities that have been conducted (testing, etc.) subsequent to the earthquake. Identify any discrepancies found as a result of these activities that may have affected functionality or indicated a need for repairs.
3. Include plant staff activities related to assuring functionality of automatic and manual fire protection systems and fire-fighting equipment.
4. Also indicate if there were fire protection system actuations, detection system signals or other fire protection related indications due to the earthquake.

Probabilistic Risk Assessment

Was the functionality of any nonsafety related equipment, credited in a risk-informed license amendment for NAPS, considered as part of the restart plan? If not, what is VEPCO's approach to ensure the continued adequacy of such risk-informed license amendments?

Steam Generators

Describe the evaluations, inspections, and analyses (if any) of the steam generators (SGs) to ensure the SG supports, tubes, and other internals (tube support structures, steam separation equipment, j-nozzles, wrapper and wrapper supports, blowdown piping, etc.) will function as designed. If a sample inspection were performed, please provide justification for limiting the scope of the inspections. Please discuss the results of the inspections highlighting any differences observed since the last inspections.

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/RA/

Meena Khanna
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Division of Operating Reactor Licensing
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