FENOC

FirstEnergy Nuclear Operating Company

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January 31, 2007

BV-L-07-018
DB-Serial Number 3307
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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Beaver Valley Power Station, Unit Nos. 1 and 2
Docket Nos. 50-334 and 50-412

Davis-Besse Nuclear Power Station, Unit No. 1
Docket No. 50-346

Perry Nuclear Power Plant, Unit No. 1
Docket No. 50-440

Subject: **Response to Request for Additional Information Regarding Resolution of Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power (TAC Numbers MD0949, MD0950, MD0973, and MD1016, respectively)**

On February 2, 2006, the NRC issued Generic Letter 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power." FirstEnergy Nuclear Operating Company (FENOC) responded on April 3, 2006, via letter BV-L-06-045, DB-Serial Number 3245, PY-CEI/NRR-2951L, addressing the Generic Letter for the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS), the Davis-Besse Nuclear Power Station, Unit No. 1 (DBNPS), and the Perry Nuclear Power Plant, Unit No. 1 (PNPP).

On December 5, 2006, the NRC issued a Request for Additional Information (RAI) containing six questions to Holders of Operating Licenses for Nuclear Power Reactors. Questions 3 and 5 apply to BVPS, DBNPS, and PNPP. The response to these two questions is included as Attachment 1. In a letter dated December 13, 2006, the NRC stated that the response due date would be January 31, 2007.

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Question 3 in the RAI seeks information about analyses, procedures, and activities concerning grid reliability, about which FENOC does not have first-hand knowledge and which are beyond the control of FENOC. For this question, FENOC relied on input that was provided by third parties.

The attached response is based on currently approved procedures and agreements. These procedures and agreements may be revised in the future based on lessons learned during the preparation of the response to this RAI, including during benchmarking.

Attachment 1, Regulatory Commitments, identifies that there are no commitments contained in this letter.

If there are any questions, or if additional information is required, please contact Mr. Henry L. Hegrat, Supervisor – FENOC Fleet Licensing, at (330) 315-6944.

I declare under the penalty of perjury that the foregoing is true and correct. Executed on January 31, 2007.

Sincerely,

Attachments: 1. Response to Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power.

2. Regulatory Commitments

CC: Regional Administrator, NRC Region I
Regional Administrator, NRC Region III
NRC/NRR Project Manager – Beaver Valley
NRC Senior Resident Inspector – Beaver Valley
NRC/NRR Project Manager – Davis-Besse and Perry
NRC Senior Resident Inspector – Davis-Besse
NRC Senior Resident Inspector – Perry

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Question 3

Verification of RTCA Predicted Post-Trip Voltage

Your response to question 2(g) indicates that you have not verified by procedure the voltages predicted by the online grid analysis tool (software program) with actual real plant trip voltage values. It is important that the programs used for predicting post-trip voltage be verified to be reasonably accurate and conservative. What is the range of accuracy for your GO's contingency analysis program? Why are you confident that the post-trip voltages calculated by the GO's contingency analysis program (that you are using to determine operability of the offsite power system) are reasonably accurate and conservative? What is your standard of acceptance?

RESPONSE

What is the range of accuracy for your grid operator's contingency analysis program?

There is no established numerical range of accuracy for the Transmission System Provider's (TSP's) contingency analysis program. However, state estimation and real time contingency analysis have been used for many years to aid in evaluating and maintaining transmission system reliability and are proven tools for analyzing transmission system contingencies.

Continuous and accurate input data is critical to the proper functioning of the State Estimator (SE). An accurate representation of the configuration of the grid components that actually exist in the field is essential. The data coming in from the sensors in the field must be accurately mapped to the correct elements in the SE model.

The other key factor to ensuring accurate SE solutions is the scope and level of detail of the model. The model must contain sufficient monitoring capability of its surrounding Reliability Coordinator areas to ensure that potential, actual operating limits are not violated.

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FirstEnergy is establishing protocols to compare post-trip nuclear power plant voltages predicted by the online grid analysis tool (software program) with actual plant trip voltage values.

Why are you confident that the post-trip voltages calculated by the GO's contingency analysis program (that you are using to determine operability of the offsite power system) are reasonably accurate and conservative?

State estimation is an advanced application that is used to ensure that power system analysis that relies on complete power system models can be performed even when incomplete or conflicting data is received from the sensing devices in the field. Basically, the SE compares actual field data to an expected value based on the power system model resident in the application. If the actual data is unavailable or out of its expected range, the SE will calculate a value and substitute it into the power system model, creating a SE solution, so that other applications can provide reasonable results.

The relevance of the SE to the post-contingency voltage calculation discussion is that the SE results are used as the input to the Real Time Contingency Analysis (RTCA). The RTCA takes the SE solution and calculates post-contingency flows, voltages and voltage drops for each contingency in the contingency list. Without a valid SE solution, the RTCA is not possible.

On rare occasions, the SE is not able to provide a valid solution due to the magnitude of missing, conflicting, or inaccurate data. Normally, such events are caused by communications or equipment failure in the field. In these cases, the TSP is required to notify the Transmission Owners (TOs) that the capability to calculate the necessary nuclear plant post-contingency voltages is temporarily unavailable and that the TSP will be deferring to the TO's RTCA results. If both the TSP and the TO lose the capability to perform RTCA, the impacted nuclear power plants are notified.

Advanced applications, like the SE and the RTCA, are critical to executing the TO's tasks as a Reliability Coordinator. All Reliability Coordinators are required to have such tools to be in compliance with NERC Standard IRO-002, Reliability Coordination--Facilities. Requirements addressing the accuracy and capability of field sensors and communications systems that feed the SE are necessary to be compliant with NERC Standard TOP-006, Monitoring System Conditions.

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Continuous and accurate input data is critical to the proper functioning of the SE. An accurate representation of the configuration of the grid components that actually exist in the field is essential. The data coming in from the sensors in the field must be accurately mapped to the correct elements in the SE model.

The other key factor to ensuring accurate SE solutions is the scope and level of detail of the model. The model must contain sufficient monitoring capability of its surrounding Reliability Coordinator areas to ensure that potential, actual operating limits are not violated.

In addition to the TSP, the TOs have their own SEs running in parallel with the TSP's SE. The respective models are different from a scope and level of detail standpoint, but the results obtained are generally close. If discrepancies between the two SEs are identified, the TSP and the TO work together to correct the problem. During the interim period, the more conservative limit becomes the operational limit.

The TSP works with the TOs and the generation owners to ensure the accuracy of the data model. The TSP builds the updated model and verifies its accuracy in a test environment before installing the updated model in the production system.

Prior to switching transmission equipment out of service, the TSP operator is required to calculate the post-switching system parameters in the vicinity of the switching using RTCA. This step is taken to ensure that the switching will not result in a reliability problem. Once the switching has been done, the operator monitors the post-switching parameters, providing a near real time comparison to what RTCA predicted. Seldom does that comparison yield an unexpected result, attesting to the accuracy of the SE and RTCA solution. Any case that does yield an unexpected result is investigated and understood. Corrective actions are taken as appropriate.

Due to the factors described above, FENOC is confident that the post-trip voltages calculated by the GO's contingency analysis program are reasonably accurate and conservative.

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What is your standard of acceptance?

FENOC relies on the TSP to operate a state estimator and a RTCA program to evaluate the nuclear power plant contingency voltages. The state estimator and contingency analysis program are utilized by the TSP as tools for evaluating and maintaining the reliability of the transmission system. The TSP utilizes these tools as a means to satisfy their responsibilities as a North American Electric Reliability Council (NERC) Reliability Coordinator as delineated in NERC Standards IRO-002 and TOP-006.

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Question 5

Seasonal Variation in Grid Stress (Reliability and Loss-of-offsite Power (LOOP) Probability)

Certain regions during certain times of the year (seasonal variations) experience higher grid stress as is indicated in Electric Power Research Institute (EPRI) Report 1011759, Table 4-7, Grid LOOP Adjustment Factor, and NRC NUREG/CR-6890. Do you adjust the base LOOP frequency in your probabilistic risk assessment (PRA) and Maintenance Rule evaluations for various seasons? If you do not consider seasonal variations in base LOOP frequency in your PRA and Maintenance Rule evaluations, explain why it is acceptable not to do so.

RESPONSE

Do you adjust the base LOOP frequency in your probabilistic risk assessment (PRA) and Maintenance Rule evaluations for various seasons?

BVPS, DBNPS, and PNPP do not adjust the base LOOP frequency in the Probabilistic Risk Assessment (PRA) and Maintenance Rule evaluations for various seasons.

If you do not consider seasonal variations in base LOOP frequency in your PRA and Maintenance Rule evaluations, explain why it is acceptable not to do so.

Although Electric Power Research Institute (EPRI) Report 1011759, Table 4-7, Grid LOOP Adjustment Factor, indicates that the likelihood of exceeding the average is greater in the summer than at other times of the year, factors other than the season also impact the LOOP frequency. Generally, major outages are scheduled in the spring and fall to avoid the summer seasonal challenges. Daily challenges are considered resulting in adjustments to maintenance practices and risk management actions. As a result, work may be delayed, suspended, or completed in an expedited manner.

The activities that heighten the possibility of a loss of offsite power are typically planned activities such as transmission line and switchyard maintenance. The

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current process provides sufficient guidance to avoid scheduling such activities concurrently with equipment (e.g., Emergency Diesel Generators) that would be required to mitigate a LOOP event.

Adjustments for bad weather and grid instability already account for seasonal effects. Therefore, there is no need to adjust the LOOP frequency in PRA and Maintenance Rule Evaluations based solely on calendar time (i.e., summer versus non-summer). Rather, activities or conditions that increase the probability of a LOOP such as switchyard work and grid/weather conditions will continue to be addressed qualitatively.

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Regulatory Commitments

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for the Beaver Valley Power Station, Unit Nos. 1 and 2, the Davis-Besse Nuclear Power Station, Unit 1, and the Perry Nuclear Power Plant, Unit 1. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not regulatory commitments. Please notify Mr. Henry L. Hegrat, Supervisor – FENOC Fleet Licensing, at (330) 315-6944 of any questions regarding this document or associated regulatory commitments.

Commitment	Due Date
None	N/A

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