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LR-N07-0006

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Salem Generating Station, Units 1 and 2
Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: Response to the Request for Additional Information Regarding Resolution of NRC Generic Letter 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power"

References:
1) Letter from Christopher Grimes (U.S. NRC) to Addressees, "NRC Generic Letter 2006-02: Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated February 1, 2006

2) Letter from Thomas P. Joyce (PSEG Nuclear, LLC) to U.S. NRC, "Response to NRC Generic Letter 2006-02: "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated March 31, 2006

3) Letter from C. Haney (U.S. NRC) to Addressees, "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," dated December 5, 2006

On February 1, 2006 the NRC issued Generic Letter (GL) 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," (Reference 1). The GL requested that all holders of operating licenses submit a written response within 60 days in accordance with 10 CFR 50.54, "Conditions of licenses," paragraph (f). The GL requested information in the following four areas in order to determine if regulatory compliance is being maintained:

(1) use of protocols between the nuclear power plant (NPP) and the transmission system operator (TSO), independent system operator (ISO), or reliability

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coordinator/authority (RC/RA) and the use of transmission load flow analysis tools (analysis tools) by TSOs to assist NPPs in monitoring grid conditions to determine the operability of offsite power systems under plant technical specifications (TSs). (The TSO, ISO, or RA/RC is responsible for preserving the reliability of the local transmission system. In this GL the term TSO is used to denote these entities);

(2) use of NPP/TSO protocols and analysis tools by TSOs to assist NPPs in monitoring grid conditions for consideration in maintenance risk assessments;

(3) offsite power restoration procedures in accordance with Section 2 of NRC Regulatory Guide (RG) 1.155, "Station Blackout," and

(4) losses of offsite power caused by grid failures at a frequency equal to or greater than once in 20 site-years in accordance with RG 1.155.

Reference 2 provided the PSEG Nuclear, LLC (PSEG) 60-day response to the requested information for Salem Generating Station.

In Reference 3, the NRC requested additional information to complete its review of the GL. Attachment 1 provides the PSEG responses to the request for the Salem Generating Station.

Some of the questions in this request seek information about analyses, procedures, and activities concerning grid reliability. This information was provided by a third party and is outside the control of PSEG. As such, the accuracy and completeness of this information cannot be validated by PSEG.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mr. Paul Duke at (856) 339-1466.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 1/26/07
(date)

Respectfully,

Thomas P. Joyce
Site Vice President
Salem Generating Station

Attachment (1)

cc: Regional Administrator - NRC Region I
NRC Project Manager, NRR - Salem Generating Station
NRC Senior Resident Inspector - Salem Generating Station
K. Tosch, Manager IV, NJBNE

Response to Request for Additional Information
Related to GL 2006-02

Salem Generating Station, Units 1 and 2

Facility Operating License Nos. DPR-70 and DPR-75

As stated in Reference 2, Salem Generating Station is located in the service territory of PJM Interconnection, LLC (PJM). PJM is the Transmission System Operator (TSO) for Salem Generating Station (SGS). The Transmission Owner (TO) providing interconnection services for SGS is Public Service Electric and Gas Company (PSE&G). PSE&G is a member of PJM. As requested in Reference 3, questions 5 and 6 apply to SGS.

Maintenance Rule

Question No. 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 indicated in Electrical 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

The SGS base probabilistic risk assessment (PRA) represents an annual estimate of core damage frequency (CDF). As such, there is no seasonal variation included in the base PRA. The annual average Loss of Offsite Power (LOOP) frequency is the appropriate parameter to use for the base PRA calculation of an annual average CDF.

As stated in the response to Question 5(c) submitted in Reference 2, PJM provided the following information to PSEG Nuclear, LLC (PSEG) regarding stress on the grid in a letter from PJM to all PJM nuclear owners (i.e., Reference 4).

"Stress on the grid is manifested in a number of ways. Stress can represent the loading levels on individual facilities, overall demand levels, the degree of facilities out of service for maintenance, occurrence of severe weather, etc. Each aspect creates a level of stress on the grid and challenges for the system operators."

SGS has an on-line risk management program consistent with 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," (i.e., the Maintenance Rule) and focused on the risk impact of the plant configuration, the grid integrity, and environmental conditions at the time of the on-line work window. Assessment of risk on the basis of current, rather than average, or adjusted average, plant configuration, weather, and grid conditions is judged to be the most appropriate input to safe, risk-informed work control and is therefore the most appropriate technical approach for managing risk.

The PSEG method of on-line maintenance risk management uses a blended approach of quantitative and qualitative analyses. Due to substantial uncertainties in the factors that contribute to grid stress and their impacts at any given time, a seasonal quantitative adjustment in the LOOP frequency is not used. Rather, to account for the configuration specific effects of degraded grid conditions or adverse environmental conditions, a qualitative "high risk evolution" override process is included that both provides awareness of the condition and triggers compensatory measures or procedural limitations on the on-line work as appropriate. One of the noted strengths of the PSEG approach to configuration risk management is that it does not require a set "number" to trigger actions. It is a risk-informed approach that considers risk calculations, defense-in-depth, and other qualitative inputs such as grid conditions.

The seasonal LOOP frequency adjustment approach, as suggested in EPRI technical report TR1011759, "Frequency Determination Method for Cascading Grid Events," (i.e., Reference 5) has been reviewed by PSEG; however, the particular implementation and conclusions in Reference 5 are not considered appropriate because of the following:

- The approach may actually underestimate the specific conditions that exist during the work-week for non-peak seasons (e.g., low grid margin or severe weather).

- The approach is not risk-informed in that it may result in the unnecessary deferral of some work that could have been performed during the "higher LOOP frequency season" but for the arbitrary global assignment of higher risk of LOOP.

The concept that the grid is "seasonal" in susceptibility to stress is in essence a different form of averaging over a shorter time interval. Even during the summer months, when there are periods of time when the grid is highly stressed there are also long periods where it is less stressed. Given this, the actual likelihood of high grid stress could vary substantially, even within a season. Attempting to reflect this concept through a quantitative "seasonal-average" approach could actually over-estimate risk during lower stress periods, or underestimate it during high stress periods.

To address factors that could affect the likelihood of a LOOP, at any time during the year, the PSEG work management procedure, WC-AA-101, "On-Line Work Control Process," (i.e., Reference 6) incorporates such measures as:

- Evaluation of maintenance activities based upon conditions, such as current power grid stability information from the system operator, the weather forecast (including information obtained from day ahead forecasts), and the current plant system, structure and component (SSC) status. If severe weather (e.g., high wind, severe thunderstorm warning, tornado watch/warning) or conditions that are potential high risk evolutions (HREs) for loss of offsite power are expected, then planned unavailability of electrical power sources is deferred.

- Declaring an HRE, and appropriately managing the plant configuration, when such conditions as the following exist or are predicted to occur:

    - Unexpected repeated station power line trips due to area environmental conditions such as icing, wind, or storms.
    - Sustained winds above the site sustained high winds procedure entry level.
    - Declaration by the TSO of a maximum emergency generation action.
    - Actual switchyard voltage alarms or notifications indicating voltage below that required for offsite source Technical Specification operability limits.
    - Predicted unit trip contingency switchyard voltage below minimum required switchyard voltage.
    - Notification that at the current time a condition exists such that if a transmission line or other transmission facility were to trip, then the site would be below voltage operability limits.

- Restoring availability, as soon as possible, of systems required to mitigate the loss of offsite power if an offsite power source becomes unavailable or degraded, or if the risk of losing offsite power significantly increases due to severe weather.

The PSEG on-line risk management program focuses on identifying compensatory measures to cope with potential grid stress conditions, regardless of season, to support effective risk management given the current conditions within a work week window. In addition, PSEG augments the on-line risk management process with guidelines that specify the planning of switchyard on-line maintenance to avoid scheduling such activities during the summer period, when peak generation periods normally occur.

The above risk-informed process ensures that potential impacts of variations in factors affecting grid reliability are evaluated on a continuing basis throughout the year and that appropriate risk management actions are taken when necessary.

Question No. 6

Interface With Transmission System Operator During Extended Plant Maintenance

How do you interface with your GO [grid operator] when on-going maintenance at the nuclear power plant, that has been previously coordinated with your GO for a definite time frame, gets extended past that planned time frame?

Response

As stated in the response to Question 6(e) in Reference 2, planned transmission outages are coordinated in accordance with a process detailed in PJM Manual 03, "Transmission Operations," Section 4 (i.e., Reference 7). This process requires advanced notice and subsequent PJM approval for all outages to ensure grid reliability. Once the equipment is switched out of service, grid status is continually monitored and evaluated by both the TO and the TSO.

The nuclear power plant (NPP) (i.e., SGS) coordinates maintenance activities that can have an impact on the transmission system with the TSO/TO. PSEG procedure SH.OP-DD.ZZ-0001, "Electric System Emergency Operations and Electric System Operator Interface," (Reference 8) provides guidelines to ensure the required communication protocol is maintained between PSEG Nuclear, the Electrical Systems Operations Center (ESOC) and PSEG Energy Resources & Trade (ER&T). SH.OP-ZZ.DD-0001 provides examples of generation status information that should be communicated to the ESOC, including delays in performing system switching.

PSEG will clarify and enhance procedure(s) (e.g., SH.OP-DD.ZZ-0001) to state that extensions to maintenance activities previously coordinated with the ESOC should be communicated to the ESOC. These actions have been entered into PSEG's Corrective Action Program.

References

1. Letter from Christopher Grimes (U.S. NRC) to Addressees, "NRC Generic Letter 2006-02: Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated February 1, 2006

2. Letter from Thomas P. Joyce (PSEG Nuclear, LLC) to U.S. NRC, "Response to NRC Generic Letter 2006-02: "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated March 31, 2006

3. Letter from C. Haney (U.S. NRC) to Addressees, "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," dated December 5, 2006

4. Letter from F. J. Koza (PJM Interconnection, LLC) to PJM nuclear owners, "PJM Information to Support Utilities Response to Generic Letter 2006-02, 'Grid Reliability and the Impact on Plant Risk and Operability of Offsite Power, dated February 1, 2006,'" dated February 23, 2006

5. EPRI Report 1011759, "Frequency Determination Method for Cascading Grid Events," dated December, 2005

6. PSEG procedure WC-AA-101, "On-Line Work Control Process," Revision 13

7. PJM Manual 03, "Transmission Operations," Revision 22, effective October 25, 2006

8. PSEG procedure SH.OP-DD.ZZ-0001, "Electric System Emergency Operations and Electric System Operator Interface," Revision 4