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January 29, 2007

U. S. Nuclear Regulatory Commission
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Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

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"

References
1) Nuclear Regulatory Commission (NRC) Generic Letter (GL) 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power", dated February 1, 2006, Accession Number ML060180352.
2) Nuclear Management Company, LLC (NMC) letter L-HU-06-030, "Response to Generic Letter 2006-02, 'Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power'", dated July 21, 2006, Accession Number ML062050349.
3) NRC letter, "Request for Additional Information Regarding Resolution of Generic Letter (GL) 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power (TAC Nos. MD0947 through MD1050), dated December 5, 2006, Accession Number ML063380300.
4) NRC letter, "Revised Response Date for Request for Additional Information Regarding Resolution of Generic Letter (GL) 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power (TAC Nos. MD0947 through MD1050), dated December 13, 2006, Accession Number ML063460440.

In Reference 1, the NRC requested that specific information be provided for each nuclear plant. Reference 2 provided the NMC responses to the requested information for the Palisades Nuclear Plant (PNP). In Reference 3, the NRC transmitted six requests for additional information (RAIs) for resolution of GL 2006-02 and a matrix listing the applicable RAI questions for each specific plant. Reference 4 requested that the RAI responses be provided to the NRC by January 31, 2007.

Enclosure 1 provides the NMC responses to RAI 1, RAI 3 and RAI 5 for PNP as requested by the NRC in Reference 3. RAI 3 requests information about analyses, procedures, and activities concerning grid operation not controlled by NMC. In providing information responsive to RAI 3, NMC makes no representation as to its accuracy or completeness.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on January 29, 2007.

Paul A. Harden
Site Vice President, Palisades Nuclear Plant
Nuclear Management Company, LLC

Enclosure (1)

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

Enclosure 1
Palisades Nuclear Plant
Response to Request for Additional Information Regarding Resolution of Generic Letter 2006-02

Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) 1, Switchyard Minimum Voltage:

In response to question 1(g) you did not identify specific minimum switchyard voltage limits (kV) that you supplied to the local transmission entity. Please, provide the following information:

a. What is the specific minimum acceptable switchyard voltage included in your protocol agreement with your grid operator (GO) and what was the basis for this value?

b. How is this value related to your technical specification degraded voltage relay setpoints?

Nuclear Management Company (NMC) response:

The degraded voltage relays provided at the Palisades Nuclear Plant (PNP) monitor the voltage on the safety related buses. The nominal Technical Specification setting for the degraded voltage relays is 93% of rated voltage. When bus voltage decreases below the setpoint, the diesel generators are started and a timer is initiated. If voltage does not recover above the degraded voltage reset value (nominally 93.5%) within 6 seconds, load shed is actuated, the diesel generator breaker is closed, and safety related loads are sequenced onto the buses.

The primary source of power to safety related buses is through a load tap changing transformer. The load tap changer maintains the buses at or above their rated voltage of 2400 Volts during normal day-to-day fluctuations in grid voltage and changes in loads on the buses. For a normal unit trip, the loads on the buses remain relatively constant following the trip. Thus, the decrease in grid voltage (normally 358 kV) following a normal plant trip would have to approach 7% to actuate the degraded voltage protection. For LOCA conditions concurrent with a plant trip, non-safety loads are shed from the transformer and additional safety related loads are block loaded onto the bus. The end result is a significant increase in the total load on the transformer. For this condition, a grid voltage decrease of slightly over 3% would be sufficient to actuate the degraded voltage protection. Note that no credit is taken for the load tap changer during the electrical transient.

As the load tap changers on the offsite power transformers maintain a constant voltage on the safety related buses over a wide range of grid voltages, there is no direct correlation between grid voltage and the degraded voltage settings. Rather, the transmission operator, via the Real Time Contingency Analysis (RTCA) tool, monitors the expected voltage drop that would occur for a contingent trip of the PNP unit. PNP is informed if the contingent voltage drop is calculated to be equal or greater than 3%.

NMC has provided the transmission operator a minimum allowable voltage for PNP as part of the plant operating agreement. This value is 334 kV. At this value, the load tap changing transformers are capable of maintaining safety related bus voltages at or above the required minimum of 2400 Volts.

NRC RAI 3, Verification of RTCA [Real Time Contingency Analysis] 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.

a) What is the range of accuracy of your GO's [grid operator's] contingency analysis program?

b) 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?

c) What is your standard of acceptance?

NMC response:

a) The range of accuracy of the GO's contingency analysis program is within the scope of the GO, North American Electric Reliability Council (NERC), and Federal Energy Regulatory Commission (FERC). The method used by the GO to verify accuracy of application results is to compare application resultant values against actual telemetered data and values from other analysis tools (State Estimator, Powerflow Analysis, Independent System Operator Security Analysis).

b) The RTCA is a tool fully within the purview of the GO; NMC confidence for use at the PNP is based on the confidence the GO has in their equipment and the resultant values. The GO's confidence is based on many years of operating experience using this application and comparing powerflow study post contingency voltage results with actual following day RTCA results. In addition, the regional Independent System Operator (ISO) (Midwest ISO) runs an independent RTCA. The GO and ISO periodically compare the results of their analyses to further assure reasonable results. Because many of the Midwest ISO (MISO) transmission owning member companies have similar RTCA programs, there are many opportunities to compare the results. This results in a high confidence that the RTCA results are accurate. However, if the resultant voltages are outside of the criteria, when they are predicted to be within, both the GO and MISO would initiate an investigation.

c) NMC acceptance for PNP is based on the GO's acceptance. The GO's acceptance is based on their experience with using the application. If the GO suspects the Security Analysis results are inaccurate they can utilize their other analysis tools (Powerflow Analysis, Power Technologies International - Power System Simulator for Engineering loadflow) to check the Security Analysis results.

NRC RAI 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.

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

b) 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.

NMC response:

NMC adjusts the PNP base LOOP frequencies in the probabilistic risk assessment (PRA) model employed in EPRI EOOS (equipment out of service) software to determine the day to day plant risk status as required by the maintenance rule. For grid stress, the base loop frequencies are only adjusted when informed by the grid operator of generation or reserve shortages. Such shortages occur most frequently during the summer months. A generic adjustment in seasonal plant risk is not utilized based on the following:

NMC has noted that degraded grid and severe weather conditions tend to occur more often during the summer months at PNP. As a result, the LOOP adjustment factors are used more often during the summer months. Using these precursor events to anticipate when a loss of offsite power is more likely is more appropriate than making a generic adjustment for the entire summer season for several reasons:

- Although they are emergent, the precursor events are relatively slow developing, so there is time available to manage the associated risk and make adjustments to scheduled work if necessary;

- Appropriately scaled adjustment factors are put in when the risk of having a LOOP event is actually higher and taken out when the risk is lower to provide a more realistic assessment of overall plant risk;

- A generic adjustment factor based on season de-sensitizes Operators and Work Week Managers to the increase in likelihood of LOOP; and

- Application of a generic seasonal adjustment factor overstates the increase in LOOP frequency for times when the likelihood of LOOP is not increased, and understates the increase of LOOP frequency when conditions are such that the likelihood is significantly increased (severe weather is present, the grid is at or near capacity, or excess generating capability is unavailable, for example).