

August 11, 2006

MEMORANDUM TO: George Wilson, Branch Chief
Electrical Engineering Branch
Division of Engineering
Office of Nuclear Reactor Regulation

FROM: Paul Gill, Senior Electrical Engineer **/RA/**
Electrical Engineering Branch
Division of Engineering
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JUNE 22, 2006, CATEGORY 2 PUBLIC MEETING
REGARDING GENERIC LETTER 2006-02, "GRID RELIABILITY AND
THE IMPACT ON PLANT RISK AND THE OPERABILITY OF OFFSITE
POWER," AND TEMPORARY INSTRUCTION 2515/165,
"OPERATIONAL READINESS OF OFFSITE POWER AND IMPACT ON
PLANT RISK"

On June 22, 2006 the Nuclear Regulatory Commission (NRC) staff held a workshop with stakeholders and the public to discuss the results of the NRC's review of Generic Letter (GL) 2006-02, "Grid Reliability and the Impact on Plant Risk and the operability of Offsite Power," and Temporary Instruction (TI) 2515/165, "Operational Readiness of Offsite Power and Impact on Plant Risk." Two short presentations were conducted. George Morris of the Electrical Engineering Branch (EEEB) discussed the results of the NRC's review of TI 2515/165. The second presenter, Paul Gill of EEEB, discussed the results of the review of GL 2006-02. The presentation slides are available in ADAMS (Accession No. ML062070043).

As a result of its grid initiatives, the staff found the nuclear power plant licensees have established agreements and protocols with their grid operators, and have considered grid-risk-sensitive equipment in their maintenance rule evaluations. The staff also found that all nuclear power plants, except one, are given off-site power restoration priority. In this workshop, the NRC staff attempted to clarify the intent of the questions in light of the variation in the responses received to GL 2006-02. In addition, the staff's review of GL 2006-02 identified eight concerns that require further attention. These concerns are as follows:

1. In question 1(g) of GL 2006-02, the NRC requested licensees to provide the specific minimum switchyard voltage that was supplied to the nuclear power plant's local transmission entity. The staff's concern was that several licensees failed to provide the minimum switchyard voltage for their site.
2. In question 2(f) of the GL, the NRC requested licensees to provide the compensatory measures taken if the real time contingency analysis or similar program was unavailable. The staff believes that the responsibility falls back to the nuclear power plant operator to provide reasonable assurance that the offsite power will be adequate if

the grid contingencies program becomes unavailable. The staff's concern is that some plants did not identify follow-up actions that address the unavailability of the grid contingencies program. Two acceptable options are the availability of a backup program through another grid entity or falling back on the original static analysis that was used to license the nuclear power plant provided that it has been updated and continues to bound the present configuration of the grid.

3. In question 2(f) of the GL, the NRC asked licensees whether the predicted post-trip voltages were validated. A load flow analysis includes assumptions in the grid model, such as transmission element impedances, available flow paths, and component loadings. The staff believes that the adequacy of those assumptions and the grid model must be verified to provide reasonable assurance that the results of the analysis are accurate. One acceptable method to demonstrate confidence in the analysis tool is to compare the predicted voltage results with actual trip voltages following an inadvertent nuclear power plant trip. The staff's concern is that none of the nuclear power plants appear to have verified the voltage predicted by the program.
4. In question 3(a) of the GL, the NRC requested information pertaining to a notification of predicted inadequate switchyard voltages. The staff's concern is that several nuclear power plant licensees only consider the loss of the nuclear power plant when determining the adequacy of the offsite power supply. For some nuclear power plants, the offsite power may be more susceptible to a loss of a transmission element rather than loss of the nuclear power plant generator itself. The staff believes that each nuclear power plant licensee, with the aid of their grid operator, should identify all transmission elements, such as larger units or critical transmission lines that could potentially affect the adequacy of the nuclear power plant's offsite power and include those elements in the contingency analyses.
5. In question 3(b) of the GL, the NRC questioned if the nuclear power plants were analyzed for a double sequencing event. A coincident loss-of-offsite power/loss of coolant accident was addressed in each plant's design basis accident analysis. The staff's concern is that this may not be the worst case scenario as safety-related equipment may not be available during a loss of coolant accident with a delayed loss-of-offsite power event. Under the condition of such an event, safety-related accident mitigating loads already being powered will now be required to be load shed and re-sequenced onto the safety buses (This condition has been dubbed Double Sequencing). Given this condition, the staff believes that the resultant electrical transients would make safety-related piping and equipment susceptible to damage.

During its review of the GL, the staff found that some nuclear power plant licensees have analyzed this condition to varying levels. However, many licensees indicated that this condition is outside their design basis and have not performed the analysis. While the staff recognizes that this scenario is not part of the original licensing bases for nuclear power plants, the industry needs to be sensitive to this vulnerability.

6. In question 5(c) of the GL, the NRC questioned whether there was a significant variation in the stress on the grid in the vicinity of the nuclear power plant site caused by seasonal loads or maintenance activities associated with critical transmission elements. The

staff's concern is that nuclear power plant licensees did not account for the higher grid stress experienced in certain regions during certain times of the year. The staff's concern is based on studies from the Electrical Power Research Institute and the NRC's Office of Nuclear Regulatory Research. Based on these studies, the staff believes that regional seasonal variations need to be addressed when assessing risk for maintenance of grid-risk-sensitive equipment.

7. In question 5(g) of the GL, the NRC questioned whether the nuclear power plant operator communicates with their grid operator periodically for the duration of grid-risk sensitive maintenance activities. The staff's concern is that several nuclear power plant licensees do not appear to have plans or procedures to inform the grid operator of changes in plant maintenance activities. The staff believes that nuclear power plant operators should keep the grid operator informed of changes during any grid risk-significant maintenance at the nuclear power plant. It is especially important to keep the grid operator informed of any changes in schedules previously agreed upon with the grid operator.
8. In question 8(b) of the GL, the NRC questioned whether nuclear power plant licensees re-evaluated the station blackout analyses for those nuclear power plants that experienced a total loss-of-offsite power event caused by grid failure since the nuclear power plant's coping duration was initially determined. The staff's concern is that nuclear power plants that had a total loss-of-offsite power caused by grid failure may no longer be bounded by their original analyses or may no longer have a loss-of-offsite power frequency of greater than or equal to once in 20 site-years. The staff believes that a review of the basis for the nuclear power plant site's station blackout analysis is required whenever a nuclear power plant site experiences a grid initiated loss-of-offsite power at a rate greater than once in 20 site years.

The staff expects to issue requests for additional information on these topics to specific nuclear power plant licensees by the fall of 2006. The staff will followup with the NRC regional offices and evaluate its regulatory options for resolving the above concerns in its continued review of the GL 2006-02. Enclosure 1 contains a list of meeting attendees.

Enclosure:
As Stated

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NAME	G.Morris	M.W. McConnell	P. Gill
DATE	8/11/06	8/11/06	8/11/06

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GENERIC LETTER 2006-02 AND TEMPORARY INSTRUCTION 2515/165

JUNE 22, 2006

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