

GNRO-2007/00001

January 31, 2007

U.S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Document Control Desk

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

Grand Gulf Nuclear Station
Docket No. 50-416
License No. NPF-29

- REFERENCES:
1. NRC letter dated February 1, 2006, *Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power* (GNRI-2006/00005)
 2. Entergy letter dated April 3, 2006, *Response to Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power* (GNRO-2006/00014)
 3. NRC letter dated December 5, 2006, *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* (GNRI-2006/00118)
 4. NRC E-Mail dated December 8, 2006 from Bhalchandra Vaidya to D. N. Lorfing, *Revised Response Date for 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*

Dear Sir or Madam:

Per Reference 1, the NRC issued Generic Letter (GL) 2006-02 to request information for determining compliance with regulatory requirements governing electric power sources. The Grand Gulf Nuclear Station (GGNS) response to the requested information in the generic letter was provided in Reference 2.

The NRC staff reviewed licensee's responses to GL 2006-02 and determined that additional information was needed to resolve the concerns discussed in the generic letter. The NRC request for additional information (RAI) on GL 2006-02 was provided to all licensees in Reference 3. The generic NRC RAIs and the plant applicability for each RAI were contained in Enclosures 2 and 3, respectively. Questions 3 & 5 were determined to require a response for GGNS. The response to these questions for GGNS is contained in the attachment to this letter. The requested information is being made under the requirements of 10 CFR 50.54(f).

The NRC requested that the additional information be provided within 30 days of receipt of the subject NRC RAIs. However, based on feedback from the nuclear industry and NEI, the NRC response date was extended to January 31, 2007 (Reference 4).

There are no commitments made in this letter. If you have any questions or require additional information, please contact W. B. Abraham at 601-437-2319.

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

Executed on January 31, 2007.

Sincerely,

A handwritten signature in black ink, appearing to read "Edward D. Harris". The signature is fluid and cursive, with a large initial "E" and "H".

Edward D. Harris
Acting Director, Nuclear Safety Assurance
/CAB:wba

Attachment: Response to Request for Additional Information for Generic Letter
2006-02 for GGNS

cc: (See Next Page)

GNRO-2007/00001

Page 3

cc: NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

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Attachment to

GNRO-2007/00001

**Response to NRC Request for Additional Information for
Generic Letter 2006-02 for GGNS**

Response to NRC Request for Additional Information (RAI) for Generic Letter 2006-02 for GGNS

NRC RAI 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?

GGNS Response

The ENS plant responses to Generic Letter 2006-02, Request 2(g), including that for Grand Gulf, all indicated, that, following an unscheduled, inadvertent unit trip, the affected unit's Engineering department is required by procedure to contact Entergy Transmission and request Entergy Transmission to compare the actual pre/post trip voltage observed for the trip and the pre/post trip voltage projected for the event, to assess the accuracy of the analysis under known system conditions. The procedure identified in the response to Request 2(g) as the one requiring these actions was ENS procedure ENS-DC-201. Therefore, all ENS plants, including Grand Gulf do have a procedural tie to confirm the adequacy of the analysis tools following an inadvertent, unscheduled trip of an ENS unit.

The confidence level for use of the contingency analysis tools for ENS purposes is provided, in part, in at least three ways:

- 1) The tools were in successful production use by Entergy Transmission for grid operations purposes prior to adaptation for ENS purposes.
- 2) The aforementioned comparisons performed by Entergy Transmission for actual versus projected cases have not revealed any significant deficiencies in the projection methodology to date.
- 3) The contingency studies that Entergy Transmission provides for ENS plants, when compared to the projections from the analysis tools, provide additional reference points for use in assessing the adequacy of the near real-time analysis tools.

GGNS knows of no stated range of accuracy or standard of acceptance for the contingency analysis tools.

Response to NRC Request for Additional Information (RAI) for Generic Letter 2006-02 for GGNS

NRC RAI 5 (Maintenance Rule)

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.

GGNS Response

NRC Information Notice (IN) 2006-06, *Loss of Offsite Power and Station Blackout Are More Probable during Summer Period*, was issued to alert the industry of the recent findings provided in NUREG/CR-6890 during seasonal summer variations. Entergy reviewed this IN as well as NUREG/CR-6890 to determine whether any changes need to be made to the Maintenance Rule (MR) (a)(4) risk assessment process to reflect concerns about increased loss of offsite power (LOOP) risk during the months of May through September (i.e., summer months). Based on our review of these documents for the Entergy Nuclear South (ENS) grid, Entergy's approach to this concern is more broadly addressed in our MR (a)(4) risk assessment than just the seasonal risk increase.

The factors that impact the frequency of LOOP are grid instability, severe weather and maintenance activities in the plant switchyard.

Grid stability

Grid stability is one of the factors cited in NUREG/CR-6890 as increasing the LOOP risk during the summer months. Grid stability is impacted by several factors, such as plant outages, available capacity, and peak electricity usage.

The Transmission Operations Center (TOC) and the System Operations Center (SOC) are centers within Entergy Transmission Operations. These centers are responsible for the operation and monitoring of the grid system. In accordance with Entergy Corporate Procedure ENS-DC-201, *ENS Transmission Grid Monitoring*, the SOC has established communication channels with ENS nuclear sites to ensure that a process exists to notify the station when the local transmission system parameters indicate a potential degraded condition or abnormal situation such that appropriate actions can be taken to maintain defense in depth. Specific alert notifications are provided to ensure grid reliability is maintained and degraded grid off-site power supply conditions are communicated. The SOC will notify the GGNS control room if critical parameter levels are outside of prescribed operating range. The GGNS control room will evaluate the grid degradation reported by SOC and take appropriate actions.

GGNS procedure [05-1-02-I-4, Loss of AC Power] provides the actions that the site's control room personnel will take when notified by the TOC/SOC that there is grid degradation. Another site specific procedure [01-S-18-6, Risk Assessment of Maintenance Activities] provides for on-line risk assessments to satisfy the maintenance rule. This procedure requires that a risk

assessment of emergent conditions be performed as soon as practical. This can be done for grid degradation within the EOOS tool by using the Switchyard Work slider bar. Adjusting the Switchyard Work slider bar to its farthest right position will increase the loss of offsite power frequency to account for the condition.

Switchyard Maintenance

Maintenance work in the plant switchyard could also impact the frequency of a loss of offsite power due to inadvertent action that would interrupt transmission of power to the nuclear plant. Scheduled switchyard maintenance is normally performed during periods exclusive of the peak summer months.

Transmission work inside the GGNS-switchyard requires communication between the Transmission Maintenance and ENS Operations personnel. Work by GGNS maintenance crews is controlled by the GGNS work control group and work performed inside the GGNS switchyard is also communicated to the TOC.

GGNS administrative procedures [01-S-18-6] and management standards [Management Standard 21, Switchyard/Offsite Power Interface] provide the actions that the onsite control room personnel will take when notified by the TOC that there is ongoing maintenance work in the local switchyard. Since this type of work is typically planned, the on-line risk assessment procedure requires an assessment of the risk prior to performing the work to satisfy the maintenance rule. The EOOS tool provides the capability of adjusting the loss of offsite power frequency for various categories of switchyard work. If the work is emergent, Operations personnel can determine the elevated risk by adjusting the Switchyard Work bar in EOOS and quantifying the PRA model. Adjusting the Switchyard Work bar will increase the loss of offsite power frequency by different factors, depending on the type of work being performed.

Severe Weather

Severe weather could also impact the frequency of a loss of offsite power. Some of the severe weather impact could be seasonal, although not always associated with the summer months. Severe weather impacts of particular interest are tornados, high winds and possibly severe thunderstorms.

Since severe weather is typically an emergent condition, Operations personnel can determine the elevated risk by adjusting the appropriate slider bar within EOOS. The GGNS EOOS model includes a slider bar for severe weather warning and a slide bar with positions for tornado watch and tornado warning. Depending on the slider bar and bar position selected, the increase in the loss of offsite power frequency is more significant (i.e., tornado warning increase factor is the highest).

Conclusions

GGNS does not specifically increase the LOOP frequency for seasonal changes. However, the factors that are cited as the reasons for the seasonal risk increase can be addressed by the use of GGNS risk management procedures and tools. These factors increase the LOOP frequency by a larger amount but for a shorter time frame and more accurately estimate the impact to plant risk for incremental and instantaneous risk assessments. Therefore, no additional actions are considered necessary by Entergy to address seasonal variations for GGNS.

However, GGNS is planning to review the related procedures and the EOOS tool to determine if the issue of grid degradation should be addressed more explicitly. Depending on the outcome of that review, minor enhancements may be made to the related procedures and the EOOS tool.