Entergy

Entergy Operations, Inc.
River Bend Station
5485 U. S. Highway 61N
St. Francisville, LA 70775
Tel 225 336 6225
Fax 225 635 5068
rking@entergy.com

Rick J. King
Director, Nuclear Safety Assurance

January 31, 2007

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Response to Request for Additional Information for Generic Letter 2006-02
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

References:

1. NRC letter dated February 1, 2006, *Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power*
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*
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*
4. NRC letter dated December 13, 2006, *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*

File No. : G9.5

RBF1-07-0009
RBG-46648

Dear Sir or Madam:

Per Reference 1, the NRC issued Generic Letter (GL) 2006-02 to request information for determining compliance with regulatory requirements

A123

governing electric power sources. The River Bend Station (RBS) response to the requested information in the generic letter was provided in Reference 2.

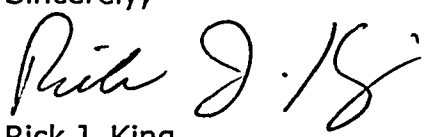
The NRC staff reviewed licensee's responses to GL 2006-02 and determined that additional information was needed to resolve the concerns discussed in the generic letter. The NRC request for additional information (RAI) on GL 2006-02 was provided to all licensees in Reference 3. The generic NRC RAIs and the plant specific applicability for each RAI were contained in Enclosures 2 and 3, respectively. Questions 1 and 5 were determined by the NRC to require a response from RBS. The responses to those questions are contained in the attachment to this letter. The requested information is being made under the requirements of 10CFR50.54(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).

No new commitments are made in this letter. If you have any questions or require additional information, please contact David N. Lorfing at 225-381-4157.

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

Sincerely,



Rick J. King
Director – Nuclear Safety Assurance

RJK/dhw

Attachment: RBS Response to NRC Request for Additional Information on Generic Letter 2006-02

cc: Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

NRC Senior Resident Inspector
P. O. Box 1050
St. Francisville, LA 70775

Attachment

RBS Response to NRC Response for Additional Information
On Generic Letter 2006-02

RAI Question No. 1
"Switchyard Minimum Voltage"

In response to Question 1(g) [of Generic Letter 2006-02], you did not identify specific minimum switchyard voltage limits (kV) that you supplied to the local transmission entity. Please, provide the following information:

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

RBS Response to RAI Question No. 1:

Generic Letter 2006-02, Question 1(g) reads as follows:

> "NRC Request 1 - Use of protocols between the NPP licensee and the TSO, ISO, or RC/RA to assist the NPP licensee in monitoring grid conditions to determine the operability of offsite power systems under plant TS.
>
> (g) Describe the low switchyard voltage conditions that would initiate operation of plant degraded voltage protection."

The response to Generic Letter 2006-02, Request 1(g), that was provided by River Bend Station indicated that the minimum switchyard voltage requirements are provided in procedure ENS-DC-199, "Offsite Power Supply Design Requirements." The response to Request 1(a) provided the following additional related information:

RBS Request 1(a) response:

> "Entergy Nuclear South (ENS) plants (i.e., Grand Gulf Nuclear Station, River Bend Station (RBS), Waterford 3, and Arkansas Nuclear One) utilize a combination of formal agreements, procedures, protocols and/or actions to have Entergy Transmission provide notification to each ENS plant if the predicted post-trip voltage does not meet the minimum value(s) specified in ENS procedure' ENS-DC-199, Offsite Power Supply Design Requirements. This is an ENS controlled procedure that is jointly reviewed by both Entergy Transmission and ENS. It contains the specifics pertaining to preferred offsite sources, including acceptable voltage, frequency, and power delivery requirements for each ENS plant. The formal agreement for RBS is referred to as the Switchyard and Transmission Interface Agreement.
>
> The formal agreements for each site provide a general framework for the establishment of procedures and processes that are deemed by each agreement to be of importance to the safe operation of the respective ENS site. Each agreement contains the requirement that the respective ENS site be provided with an assured source of offsite power in accordance with procedures to be agreed upon by the respective ENS site and the Entergy Transmission organization.
>
> The monitoring process used by Entergy Transmission..."

That response indicated that ENS plants have a procedurally controlled minimum acceptable voltage specified for each site; that this voltage range is communicated by ENS to the Entergy Transmission organization and used to provide ENS sites with offsite power sources that meet ENS site requirements; and thereby satisfy the intent of the indicated protocol document for each site and the Entergy Transmission organization. The response indicated that these sites do have degraded voltage protection schemes that are described in existing license basis documents, including the Site Technical Specifications and UFSAR.

The site-specific minimum acceptable switchyard voltage value for RBS, as communicated to the grid operator in accordance with procedure ENS-DC-199, is 220 KV (0.9565 per unit, on a 230 KV nominal basis). This minimum voltage value is also reflected in the RBS Updated Safety Analysis Report.

The plant degraded voltage protection scheme assures the ability to power the required loads in response to a postulated design basis accident. Power will be provided from the preferred offsite service when the minimum acceptable voltage values are met. The Technical Specification setpoints for the bus degraded voltage relays were selected to allow the relays to reset after any motor starting transients with automatically started accident loads running and the grid at or above the switchyard voltage of 220 KV.

RAI 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 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.

RBS Response to RAI Question 5:

NRC Information Notice (IN) 2006-06 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 (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 grid, Entergy more broadly addresses the conditions which would bound the seasonal risk increase. The Entergy Nuclear South sites have chosen to address this in the (a)(4) risk assessment.

The conditions 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 ENS-DC-201, ENS Transmission Grid Monitoring, the SOC has communications channels established 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 ENS site control room if critical parameter levels are outside of prescribed operating range. The ENS control room will then evaluate the grid degradation reported by SOC and take appropriate actions.

As discussed in the initial response to GL 2006-02, RBS procedure OSP-0063, "Grid Monitoring," provides the actions that the main control room crew will take when notified by the SOC of a degraded grid condition. RBS procedure ADM-0096, "Risk Management Program Implementation and On-Line Maintenance Risk Assessment," provide for on-line risk assessments to satisfy the maintenance rule. Within that procedure there are instructions to calculate the elevated risk due to an increased likelihood of loss of offsite power due to grid instability. Operators can calculate the elevated risk by adjusting the Grid Instability bar in EOOS and quantifying the PRA model. Adjusting the Grid Instability bar will increase the loss of offsite power frequency.

In summary, Entergy Transmission Operations recognizes when grid instability is present. Communication lines are in place to promptly notify the site's main control room of unstable grid conditions. When the main control room is notified of the unstable condition, personnel have procedures in place to evaluate the condition. Once the evaluation is made, they have the means to calculate the risk.

Switchyard Work

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. Work inside the ENS switchyards requires communication between the TOC and the ENS Operations personnel. Work by ENS maintenance crews is controlled by the ENS work control group and is also communicated to the TOC.

RBS procedure ADM-0096 provides the actions that the onsite control room personnel will take when notified by the TOC that there will be maintenance work in the local switchyard. Within that procedure there are instructions to calculate the elevated risk due to an increased likelihood of loss of offsite power due to switchyard work. Operators 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.

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.

RBS uses procedure AOP-0029, "Severe Weather Operation," in such cases. The entry conditions for that procedure are either a warning issued by the National Weather Service or local indications (high wind instruments or tornado spotted locally). That procedure instructs the operators to increase the LOOP risk per the on-line maintenance procedure. Within that procedure there are instructions to calculate the elevated risk due to an increased likelihood of loss of offsite power due to severe weather.

Conclusions

RBS does not specifically increase the LOOP frequency for overall seasonal changes. However, the ENS sites address the conditions that bound the seasonal risk increase. Specific conditions that would be projected by the TOC increase the LOOP frequency by a larger amount than that denoted in IN 2006-06 and NUREG/CR-6890. The actions described above more accurately estimate the impact to the frequency of LOOP risk for incremental and instantaneous risk assessments. Therefore, the current procedural guidance is considered by Entergy to be acceptable to address conditions that impact the frequency of LOOP plant risk for River Bend Station.