Entergy

Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61
P. O. Box 220
St. Francisville, LA 70775
Tel 225 336 6225
Fax 225 635 5068

Rick J. King
Director
Nuclear Safety Assurance

March 29, 2001

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

Subject: River Bend Station - Unit 1
Docket No. 50-458
License No. NPF-47
Response to Request For Additional Information On River Bend Individual Plant Examination Of External Events (IPEEE) Submittal (TAC No. M83667)

References: See Enclosure

File Nos.: G9.5

RBF1-01-0073
RBG-45697

Ladies and Gentlemen:

By letter dated June 30, 1995, Entergy Operations, Inc., submitted the Individual Plant Examination of External Events (IPEEE) for River Bend Station (RBS). Based on your ongoing review of the submittal, a request for additional information (RAI), Reference 3, was issued. Question 1 asked that the EOI reevaluate the impact of a cabinet fire based on the new EPRI report entitled "Guidance for Development of Response to Generic Request for Additional Information on Fire Individual Plant Examination for External Events (IPEEE)," dated May 1999. Question 2 requested that EOI provide an analysis of previously screened areas that would be retained under screening performed in accordance with the NRC approved version of the fire-induced vulnerability evaluation (FIVE) methodology dated September 1993.

This letter is to inform you that the study has been completed. The response to Question 1 was contained in Reference 6. The response to Question 2 is provided in the enclosure to this letter. In summary, the study determined that two additional fire areas would not have screened based on our evaluation as described in the enclosure. As a result, the overall fire core damage frequency (CDF) increased from 2.25E-5/year to 2.51E-5/year. This indicates that no changes to the plant are warranted.

A011

There are no commitments in this letter. This submittal has been discussed with the Project Manager. If you have any additional questions or comments, please contact Mr. B. M. Burmeister at (225) 381-4148.

Sincerely,

RJK/BMB
Enclosure

cc: Mr. Robert Moody, NRR Project Manager
U. S. Nuclear Regulatory Commission
M/S OWFN 07D01
Washington, D. C. 20555

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

U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

Enclosure

References

1) Supplemental Response to Generic Letter 88-20, Dated June 30, 1995 (RBG-41646)

2) Response to Request For Additional Information On River Bend Individual Plant Examination Of External Events (IPEEE) Submittal, Dated February 26, 1998 (RBG-44407)

3) River Bend Station, Unit 1 – Request For Additional Information – Individual Plant Examination Of External Events Submittal, Dated August 11, 1999 (TAC No. M83667)

4) Response to Request For Additional Information On River Bend Individual Plant Examination Of External Events (IPEEE) Submittal, Dated October 18, 1999 (RBG-45145)

5) Supplemental Response to Request For Additional Information On River Bend Individual Plant Examination Of External Events (IPEEE) Submittal, Dated May 9, 2000 (RBG-45338)

6) Supplemental Response to Request For Additional Information On River Bend Individual Plant Examination Of External Events (IPEEE) Submittal, Dated July 31, 2000 (RBG-45444)

NRC RAI question two; Zone with No SSA Equipment

The response to the previous RAI Question 4 relating to the basis for qualitative screening, cites a reference to the fire-induced vulnerability evaluation (FIVE) methodology, which is incorrect and inconsistent with that approved for IPEEE submittals. The figure cited, Figure 5.1, provides the cited guidance but was taken from the April 1992 draft of the FIVE methodology. The September 1993 version was approved for IPEEE submittals by the NRC and shows, in the same figure as that cited, that fire-initiated events leading to plant trips are to be considered in qualitative screening. With the inclusion of such criteria it is unlikely that typically important areas, such as those in the turbine building, would be qualitatively screened.

Please provide an analysis of those previously screened areas that would be retained under screening performed in accordance with the approved methodology.

River Bend Station Response

The NRC requested that River Bend perform a more detailed evaluation of each of the fire areas that screened based on the presence of no safe shutdown analysis (SSA) equipment in the area.

River Bend qualitatively screened these areas based on Figure 5-1 of EPRI FIVE (EPRI TR-100370). Note that this figure was changed in September 1993 because of discussions with the NRC. Fire zones can only be screened qualitatively if there is no SSA equipment in the area and no fire-induced initiating event occurs.

In a December 9, 1999, phone conversation between the NRC and EOI personnel, concerning the scope and schedule for the response to the request for additional information, EOI proposed that only the non-SSA zones with offsite power cables routed through the zone be evaluated to satisfy this request. The non-SSA zones without offsite power cables are bounded by one of the other scram initiators (turbine trip, loss of condenser heat sink, loss of feedwater, etc.) evaluated in the PSA. The fire frequencies for these initiators are generally much lower than the associated initiating event frequencies in the PSA based on a comparison of the fire ignition frequencies in IPEEE Table 4-5 and the generic initiating event frequencies in NUREG/CR-5750. In addition, IPEEE analyses for other plants show that the non-SSA areas with offsite power cables generally have a larger impact on calculated fire risk when compared to non-SSA areas without offsite power cables. Sixty-one zones were screened per IPEEE Table 4-6 based on no SSA equipment in the area.

The process used for this study was very similar to that used in the IPEEE. The study is summarized below:

First, the offsite power cables that run through the non-SSA zones were identified and the associated fire zones and cable trays determined. This information was then screened to determine which of the Fire Areas were already evaluated in the IPEEE. In essence, any Fire Areas with safety-related equipment were previously evaluated. Table 1 shows the remaining fire areas.

Table 1 – Fire Areas Requiring Walkdown

Fire Areas
AX-1, AX-2, AX-3,
ET-3, ET-4, ET-6,
NS-1, NS-3, NS-4,
T-2/Z-1, T-2/Z-2, T-3/Z-7, T-3/Z-13

In four of the thirteen fire areas walked down (Fire Areas AX-3, ET-3, ET-4, and NS-1), the cables of interest would not be damaged. This determination is based on the physical configuration of the equipment in the areas. A fifth area, AX-1, is simply a cable spreading area beneath the floor of the Auxiliary Control Room. AX-1 sees no traffic (one must pull up floor panels in the Auxiliary Control Room to gain access) and it contains no equipment. The area is also protected by halon. Thus, the likelihood of a fire in AX-1 is considered insignificantly small and the area was screened from further investigation.

It is of interest, instead of calculating the specific credited core damage probabilities (CCDP's) for these Fire Areas, to compare the fire frequency to the frequency of other PSA initiating events. For the purposes of this comparison, the lowest applicable initiating event frequency is the most bounding, i.e., the Loss of Feedwater Transient (T3B) initiating event frequency of 0.236/year. A comparison of the highest fire ignition frequency (NS-1, 7.47E-04/year) with the lowest initiating event frequency (T3B, 0.236/year) indicates that the initiating event frequency easily bounds the frequency of an event of a similar type as a result of a fire in any of these Fire Areas. This confirms the adequacy of the Screen 4 screening of these Fire Areas where the cable would not be damaged by fire.

Table 2 - Fire Areas Eliminated by Screen 4

Screen 4	**Fire Areas**
Screen 4: CDF < 1E-06/year; Equipment Damage Determined By Fire Modeling	AX-1, AX-3, ET-3, ET-4, NS-1

Each of the remaining fire areas was further analyzed. For each fire area-specific scenario identified, the existing fire ignition frequency was modified to better represent the scenario at hand. Since the topic of this evaluation is the vulnerability of cables providing offsite power, each scenario resulted in one of three general accidents: Loss of Division I Power, Loss of Division II Power, or Total Loss of Offsite Power. The modified fire ignition frequency for each scenario was then multiplied by the Conditional Core Damage Probability of the resulting accident. The resulting Core Damage Probabilities for the scenarios in each fire area were then summed and compared to the screening criteria of 1.00E-06/year (Screen 5). Those fire areas with Core Damage Probabilities below 1.00E-06/year were screened from further analysis. Those fire zones with Core Damage Probabilities above 1.00E-06 were retained and reviewed for insights. Table 3 lists the fire areas eliminated by Screen 5.

Table 3 - Fire Areas Eliminated by Screen 5

Screen 5	**Fire Areas**
CDF < 1E-06/year; Ignition Frequencies Specific to Scenarios	AX-2, ET-6, NS-3, NS-4, T-2/Z-1, T-3/Z-7, T-3/Z-13

Only two fire areas, Fire Areas T-2/Z-2 and NS-4, were found to have a core damage frequency above the 1.00E-06/year screening criteria (see Table 4). As explained in the IPEEE, the criteria for identifying a vulnerability at RBS is that if the total core damage frequency or the core damage frequency of any functional accident sequence exceeds 1.0E-04 per year, a vulnerability associated with the overall plant or sequence is assumed to exist. Based on that criteria, no additional fire vulnerabilities were identified. However, significant insight was gained regarding Fire Areas NS-4 and T-2/Z-2. Note that these core damage probabilities are conservative and could possibly be reduced through additional evaluation, for example, crediting non-SSA systems.

Table 4 - Fire Areas Surviving the Screening Process

Fire Area	Core Damage Probability
NS-4	1.10E-06/year
T-2/Z-2	1.52E-06/year

Fire Area NS-4 is defined as the Normal Switchgear Room 1A and consists of only one zone. This area is located on the southern third of elevation 98'-0" of the Normal Switchgear Building. Fire Area NS-4 contains two normal switchgear cabinets into which enter offsite power cables that feed Division I power equipment. These two cabinets, 1NNS-SWG1A and 1NPS-SWG1A, are two of five cabinets in the fire zone. A cabinet fire in either cabinet would potentially damage the associated offsite power cables.

Fire Area T-2 is defined as the Turbine Building General Area elevation 67'-6" and consists of six zones. Zone T-2/Z-2 is the General Area on elevation 67'-6" of the Turbine Building. The north east corner of Fire Area T-2/Z-2 has a horizontal run of non-divisional cable (cable tray 1TC352N) that provides power to Division I components and resides about six inches away from cabinets MCC 1NHS-MCC1E and -MCC1F. Additionally, cable tray 1TC350N, which provides power to Division II components, intersects 1TC352N at a 90 degree angle in close proximity to the same cabinets. A cabinet fire would potentially damage both the Division I and Division II offsite power cables.

It should be noted that while the fire areas in question have core damage probabilities too high to screen, these values are still very close to the screening value of 1.00E-06/yr. As explained in the IPEEE (p. 151), the criteria for identifying a vulnerability at RBS is that if the total core damage frequency or the core damage frequency of any functional accident sequence exceeds 1.0E-04 per year, a vulnerability associated with the overall plant or sequence is assumed to exist. Based on those criteria, no additional fire vulnerabilities were identified. Also, when compared to the seven fire areas which did not screen in the IPEEE (see Table 4-13), these fire areas result in a small contribution to the overall calculated Fire CDF, increasing it from 2.25E-5/year to 2.51E-5/year. This indicates that no changes to the plant configuration are warranted.

Due to conservatism in the analysis, the CDF's for internal fires are <u>not</u>, and should <u>not</u> be directly compared to, the CDF's calculated in the internal events IPE. The conservatism and uncertainties associated with a Fire PRA are much greater than those associated with an internal events IPE, thus making a direct comparison impractical. Such a comparison could mask true risk importance because of the different natures of internal events versus external event PRAs.