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February 23, 2001

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

Subject: River Bend Station - Unit 1
Docket No. 50-458
License No. NPF-47
Preliminary Information Regarding A Possible Amendment Request

File Nos.: G9.5, G9.42
RBF1-01-0049

Gentlemen:

On February 23, 2001, members of the Entergy Operations, Inc. (EOI) staff at River Bend Station (RBS) discussed contingency alternatives being considered internally regarding a possible amendment request involving the Main Steam – Positive Leakage Control System (MS-PLCS), with members of the NRC staff. Currently, RBS is in a 30 day shutdown LCO under Technical Specification 3.6.1.9 due to a packing leak on main steam line shutoff valve B21-MOV-F098A which causes the Division 2 MS-PLCS subsystem for main steam line "A" to be inoperable. The 30 day LCO expires on March 13, 2001.

EOI is planning to repair the packing leak while on-line using three sequential maintenance options. The amendment consideration is the fourth possible contingency in the event that repair of the main steam shutoff valve B21-MOV-F098A is not successful. Attached is a copy of a preliminary approach for an amendment request for your information and pre-application review. This letter does not constitute a request to amend the River Bend Station Operating License. If the primary three maintenance options prove to be unsuccessful, EOI may formally request an amendment to the license by separate correspondence.

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We will continue to keep the NRC staff informed on the plant status and planned maintenance activities. Please direct any questions you may have concerning this correspondence to Mr. Joe Leavines at 225-381-4642.

Very truly yours,

RJK/JWL
Attachment

cc: U. S. Nuclear Regulatory Commission
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ATTACHMENT 1

To

Letter No. RBF1-01-0049

Preliminary Information Regarding A Possible Amendment Request

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DESCRIPTION OF PROPOSED CHANGES

EOI proposes to change Condition 2. C. (2) of the Operating License to read as follows (proposed changes are in bold):

> Technical Specifications and Environmental Protection Plan
> The Technical Specifications contained in Appendix A, as revised through Amendment No. 70 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated In the license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan **with the following exception:**
>
> > **The Division 2 subsystem of Main Steam Positive Leakage Control System (MS-PLCS) associated with Main Steam Line A may be inoperable from the date of Amendment ____ until the next plant shutdown.**

The proposed amendment would allow the outboard MS-PLCS subsystem (Division 2) on MSL "A" to be inoperable until the next shutdown. Should the redundant Division 1 MS-PLCS subsystem on MSL "A" become inoperable, the Technical Specifications allow continued operation for 7 days. Should the emergency diesel generator supporting the OPERABLE Division 1 MS-PLCS subsystem become inoperable, the TS allow continued operation for only 72 hours. These requirements are unchanged and will be complied with during the time that the requested change is in effect.

BACKGROUND

RBS utilizes four main steam lines from the reactor to supply steam to the main turbine. Each line is provided with redundant Main Steam Isolation Valves (MSIVs) at each containment penetration.

As described in USAR Section 6.7, the MS-PLCS supplements the isolation function of the MSIVs by limiting the fission products that could leak through the closed MSIVs after a Design Basis Accident (DBA) loss of coolant accident (LOCA).

The MS-PLCS consists of two independent subsystems: an inboard subsystem (Division 1), which is connected between the inboard and outboard MSIVs; and an outboard subsystem (Division 2), which is connected to the main steamline shutoff valves (B21-MOVF098A,B,C,and D) and the valve stem packing glands of the outboard MSIVs. The MS-PLCS provides a positive air pressure with respect to reactor vessel pressure following system actuation. The MS-PLCS is

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supplied with compressed air by two separate and redundant compressed air supply subsystems. Each subsystem receives power from a separate division of the emergency power supply.

The MS-PLCS inboard and outboard systems are remote-manually initiated approximately 20 minutes following a DBA LOCA, and are designed to control and minimize leakage through the MSIVs for up to 30 days. Operation of both systems is initiated after it has been ascertained that a design-basis LOCA has occurred (as evidenced by high drywell pressure and low reactor water level indications in the main control room). Either one of the two systems is sufficient to establish the necessary barrier between the containment and the environs. As a prerequisite to the operator's action in actuating the system, the motor-operated valves within the main steam system scope, considered as an integral part of a successful MS-PLCS operation, must be cycled to the closed position using their respective remote manual switches.

With the packing leak on B21-MOVF098A, the MS-PLCS Division 2 subsystem is not able to maintain adequate positive pressure between the two disks of the flex wedge gate in the valve. The condition has no affect on the operability of the MS-PLCS associated with the other main steam lines, since the MS-PLCS air supply to B21-MOVF098A is isolated.

BASIS FOR PROPOSED CHANGE

EOI has performed an engineering analysis which shows that continued operation is justified until the next plant shutdown with the Division 2 MS-PLCS on MSL A inoperable because adequate defense-in-depth is maintained to limit leakage to within the dose limits of 10 CFR 100 and GDC 19. EOI has also included a risk assessment associated with the proposed change. The details of the analysis and risk assessment are discussed below.

Current Licensing Basis Analysis

The RBS current licensing basis (CLB) DBA LOCA analysis is that used as support for TS Amendment 113 (TAC No. MA8916). The application for amendment was submitted by Reference 1 and supplemented by Reference 2. That analysis assumes a single active failure during a DBA LOCA and concludes that there is no out-leakage through any of the main steam lines because at least one of the MS-PLCS subsystems in each main steam line is operated to provide a positive pressure seal. Any leakage through the MSIVs would be reverse flow from the MS-PLCS towards the reactor. This reverse flow has the potential to pressurize the containment during a postulated DBA LOCA by forcing air pressure upstream of the MSIVs. This potential is precluded by the MSIV in-leakage rate limits specified in the Technical Specifications. The air pressure for the Division 2 MS-PLCS associated with MSL A has been secured which further

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reduces the probability of pressurizing the containment with the MS-PLCS air supply.

The assumptions and resulting dose consequences of the CLB analysis supporting Amendment 113 was provided to the NRC by Reference 2. This information is also included in attached Table 1 to more easily compare the resulting doses from that analysis with the engineering analysis performed to justify continued operation until the next plant shutdown.

The CLB DBA LOCA analysis modeling is not conservative for the situation where one MS-PLCS subsystem is inoperable and the redundant subsystem is assumed to fail. The CLB analysis places the accident source term primarily in the containment as a conservative means of maximizing the release. This model must be modified for the situation where MSIV leakage could occur due to failure of the MS-PLCS. Therefore the engineering analysis supporting this request modifies the model to homogenize the drywell and containment atmosphere after the initial blowdown to provide a larger accident source term available for release through the MSIVs.

Engineering Analysis to Support Continued Operation

The CLB DBA LOCA analysis model was modified to account for leakage through the "A" MSL since the outboard Division 2 MS-PLCS will be inoperable for MSL A and the inboard Division 1 MS-PLCS is assumed to fail. The TS limit total leakage through the four main steam lines is 150 scfh (reference TS SR 3.6.1.3.10). The engineering analysis is only concerned with leakage through MSL "A" since the other three main steam lines have both divisions of MS-PLCS operable, therefore one division of MS-PLCS will be operable to prevent leakage through those lines. To account for the MSL leakage, a flow path was added from the drywell to the environment. The flowrate for this path was assumed to be 55 scfh. This is a reasonable assumption based on the last leakage test performed during Refueling Outage 8. The worst case leakage of any MSIV on any MSL during RF08 was 55 scfh. The leakage for the two MSIVs on MSL line "A" was 19 scfh and 36 scfh, respectively. Assuming a leakage rate of 55 scfh for the "A" MSL allows for an approximate 50% degradation from the last known condition of the MSIVs.

The model was also modified such that only the MSL doses were calculated. The doses from other contributors, such as containment leakage and ESF leakage are conservatively assumed to be the same as the CLB analysis and were added to the MSL leakage dose to determine the new DBA LOCA dose. In order to prevent an overly conservative double counting of these other dose contributions, all containment leakage (i.e. containment leakage, PVLCS leakage, etc) was directed to an inventory sink that was added to the model.

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There is no leakage from this sink to the environment, therefore, the double-counting of dose is avoided.

Since the engineering analysis is intended to only support continued operation in the current cycle, three conservatisms in the CLB DBA LOCA model were reduced in this model. First, the drywell bypass leakage was reduced from the Tech Spec as-found limit of 1.0 ft^2 $A/\sqrt{K}$ to the leak rate test as-left acceptance value of 0.1 ft^2 $A/\sqrt{K}$ (Reference TS SR 3.6.5.1.3). This assumption is still conservative since the actual bypass leakage rate from the last surveillance is approximately 0.027 ft^2 $A/\sqrt{K}$. Second, the volume between the inboard and outboard MSIVs was credited for holdup time. The CLB LOCA analysis does not credit holdup of leakage to the environment. Third, the doses presented to the NRC in LAR 2000-002 (Amendment 113) conservatively included an additional liquid leakage term based on SRP 15.6.5, Appendix B.III guidance. This term is only applicable to plants without ESF filtration systems. The RBS Standby Gas Treatment System is an ESF filtration system, therefore, the additional leakage term is not included in the results presented above.

A final modification to the model was that flow paths from the drywell to the containment and from the containment to the drywell were added to represent hydrogen mixing. Hydrogen mixing was only added to homogenize the drywell and containment atmospheres to conservatively maximize the dose rate due to MSIV leakage. The mixing of the atmospheres increases the MSL leakage dose rate since the activity initially (at t=0) released into the drywell is rapidly flushed out of the drywell during the blow-down. Mixing the drywell and containment after the blow-down replaces the inventory in the drywell while taking credit for the scrubbing of the suppression pool. The drywell and containment atmospheres are not homogenized at t=0 due to the drywell bypass. Since the drywell bypass leakage is not scrubbed by the suppression pool the inventory available for release is increased. Homogenizing the atmosphere at t=0 and crediting the suppression pool decontamination was not applied since it would be less conservative. The flow in the hydrogen mixing was assumed to be 1.0E+05 cfm to assure rapid mixing. This hydrogen mixing was started right after the initial drywell blow-down. Starting the hydrogen mixing before this time is non-conservative since homogenizing the environments before the blow-down is complete reduces the available source term by increasing the suppression pool scrubbing.

Based on the model described above, dose consequences were calculated for leakage through MSL A. A summary of the results of these calculations is provided in Table 1.

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Risk Evaluation

The MS-PLCS is not credited in the RBS Level 2 PSA model. Even a complete loss of the MS-PLCS would only lead to a 150 scfh leakage path from the drywell to the atmosphere. The leakage (55 scfh assumed) through the "A" Main Steam Line due to the inoperable MS-PLCS train is not considered a large release. The dose evaluation shows that the assumed MSIV leakage would result in doses less than 10CFR100 limits, therefore, this leakage is not a Large Early Release Frequency (LERF).

The risk impact of the proposed change is evaluated qualitatively. As explained previously, MS-PLCS is only credited in the CLB analysis for Loss of Coolant Accidents (LOCA's). The initiating event frequency for LOCA's is relatively low as compared to other events. NUREG/CR-5750, "Rates of Initiating Events at U. S. Nuclear Power Plants: 1987 - 1995," explains:

> "For LOCA categories, the frequencies were evaluated using data and information prior to 1987 due to the relatively low frequency and the corresponding sparseness of data. No pipe break LOCA events were found in the U. S. operating experience. For the small pipe break LOCA frequency, the estimate from WASH-1400, *Reactor Safety Study,* was updated using U. S. reactor experience. For medium and large pipe break LOCA's, frequency estimates were calculated by using the frequency of leaks or through-wall cracks that have occurred which challenge the piping integrity. Further, conservative estimates were used for the probability of break given a leak (based on a technical review of information on fracture mechanics, data on high energy pipe failures and cracks, and assessment of pipe break frequencies estimated by others since WASH-1400)."

The pipe-break frequencies (per critical year) are provided in Table 2, below. Note that the proposed change would only be in place for the period from 3/2001 through 9/2001 (~seven months), so the actual probability of a LOCA event during this period would be even lower.

The RBS baseline core damage frequency (CDF) is 9.44E-6/year based on a 1E-9/yr truncation limit . This core damage frequency is distributed among a number of functional sequences and initiating events, the most dominating of which is a loss of offsite power. The individual contributions to core damage from a Large LOCA and Intermediate LOCA are also shown in Table 2. An Intermediate LOCA is a LOCA with a steam leak area less than 0.3 ft^2. A small LOCA is generally characterized by slow or no vessel depressurization and a small inventory loss from the vessel. The reactor vessel does not depressurize very quickly and low capacity systems such as Reactor Core Isolation Cooling (RCIC) are sufficient to make up the inventory depletion. Therefore, it is an insignificant contributor to core damage.

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In conclusion, the frequency of a LOCA is relatively low, and thus the contribution to core damage frequency is very low (less than 2% of the total CDF). The low event frequency coupled with the short duration of the proposed change make the anticipated need for the MS-PLCS system highly unlikely.

TABLE 2

INITIATOR/DESCRIPTION	NUREG/CR-5750	CONTRIBUTION TO CDF
A = Large LOCA	3E-5/yr	0.94%
S1 = Intermediate LOCA	4E-5/yr	0.68%
S2 = Small LOCA	5E-4/yr	insignificant

The likelihood of a DBA LOCA combined with a single failure of the operable Division 1 MS-PLCS would be even lower than those probabilities presented in the above table. The likelihood of an undetected failure of the MS-PLCS air compressor is low since the compressors are operated for 15 minutes every 31 days as required by TS SR 3.6.9.1.2 and the air pressure in the accumulators supplied by the MS-PLCS compressors is monitored every 24 hours as required by TS SR 3.6.1.9.1.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Entergy Operations, Inc. is proposing that the River Bend Station Operating License be amended to allow the Division 2 Main Steam – Positive Leakage Control System (MS-PLCS) subsystem for Main Steam Line "A" to be inoperable until the next plant shutdown.

An evaluation of the proposed change has been performed in accordance with 10CFR50.91(a)(1) regarding no significant hazards considerations using the standards in 10CFR50.92(c). A discussion of these standards as they relate to this amendment request follows:

1. **Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The pertinent accident of consideration for the proposed change is the DBA LOCA. The MS-PLCS is not an initiator of this event. The MS-PLCS is a mitigating feature that limits radiological dose consequences of the Design Basis LOCA. The consequences of a DBA LOCA have been evaluated to determine the potential impact of allowing continued operation with one MS-PLCS subsystem inoperable during the current

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operating cycle. Although the dose consequences are increased for the proposed change, the calculated dose remains less than the limits of 10 CFR 100 and GDC 19.

The MS-PLCS also has the potential to pressurize the containment during a postulated DBA LOCA by forcing air pressure upstream of the MSIVs. This potential is precluded by the MSIV in-leakage rate limits specified in the Technical Specifications. The air pressure for the Division 2 MS-PLCS associated with MSL A has been secured which further reduces the probability of pressurizing the containment with the MS-PLCS air supply.

Therefore, this change does not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. **Will operation of the facility in accordance with this proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed changes do not alter the operation of the plant or the manner in which it is operated and does not involve any plant modifications. The MS-PLCS is a standby system which is manually operated to limit MSIV leakage during a postulated DBA LOCA event. Allowing a MS-PLCS subsystem to out of service during plant operation does not introduce any new accident precursors.

   Therefore, this change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. **Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?**

   An engineering analysis performed for this one-time change shows that the dose consequences are less than the dose limits of 10 CFR 100 and GDC 19. The model inputs and assumptions differ from the current licensing basis DBA LOCA analysis, but are reasonable and conservative with respect to projected dose consequences. Therefore, this change does not involve a significant reduction in the margin of safety.

Therefore, based on the reasoning presented above and the previous discussion of the amendment request, Entergy Operations has determined that the requested change does not involve a significant hazards consideration.

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ENVIRONMENTAL IMPACT EVALUATION

Pursuant to 10CFR51.22(b), an evaluation of the proposed amendment has been performed to determine whether or not it meets the criteria for categorical exclusion set forth in 10CFR 51.22 (c) (9) of the regulations. The basis for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described previously in the evaluation.

2. As discussed in the significant hazards evaluation, this change does not result in a significant change or significant increase in the radiological doses for any Design Basis Accident. The proposed license amendment does not result in a significant change in the types or a significant increase in the amounts of any effluents that may be released off-site.

3. The proposed license amendment does not result in a significant increase to the individual or cumulative occupational radiation exposure since the MS-PLCS system is a standby system that is only operated during accident conditions. The inoperability of the system during plant operation does not affect occupational exposure.

REFERENCES

1. Letter from R. K. Edington to USNRC Document Control Desk dated May 8, 2000.
2. Letter from R. K. Edington to USNRC Document Control Desk dated August 30, 2000.

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Table 1
Dose Consequences Assuming MSIV Leakage
(in Rem)

	Thyroid	Whole Body	Skin
EAB			
• Amendment 113 Dose	82.96	5.48	
• Revised Dose (See note)	82.96	5.49	NA
• MSL Leakage Addition	39.2	0.89	
Total	**122.16**	**6.38**	
LPZ			
• Amendment 113 Dose	124.7	2.96	
• Revised Dose (See note)	60.76	2.92	NA
• MSL Leakage Addition	233.4	0.93	
Total	**294.16**	**3.85**	
Control Room			
• Amendment 113 Dose	8.17	0.46	9.55
• Revised Dose (See note)	7.76	0.46	9.55
• MSL Leakage Addition	14.66	0.24	5.32
Total	**22.42**	**0.70**	**14.87**

NOTE: The doses presented to the NRC in LAR 2000-002 (Amendment 113) conservatively included an additional liquid leakage term based on SRP 15.6.5, Appendix B.III guidance. This term is only applicable to plants without ESF filtration systems. The RBS Standby Gas Treatment System is an ESF filtration system, therefore, the additional leakage term is not included in the results presented above. Note that this term is also not required to be included in LOCA dose calculations per the current draft of Appendix C of NEI 99-03.