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Rick J King
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RBG-46047

December 6, 2002

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

SUBJECT: River Bend Station, Unit 1
Docket No. 50-458
Supplement to Amendment Request
Request for Additional Information Concerning the Modification of the Technical Specification Surveillance Requirements for the Reactor Coolant System Safety/Relief Valves

REFERENCES: RBG-45946, "Modification of the Technical Specification Surveillance Requirements for the Safety/Relief Valves" dated May 14, 2002

NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants"

Dear Sir or Madam:

By the letter referenced, Entergy Operations, Inc. (Entergy) proposed a change to the River Bend Station, Unit 1 (RBS) Technical Specifications (TSs) in order to modify the surveillance requirements for the Reactor Coolant System Safety/Relief Valves.

Entergy and members of your staff held a call to discuss questions the Staff had about the changes. As a result of the call, three questions were determined to need formal response. Entergy's response is contained in Attachment 1.

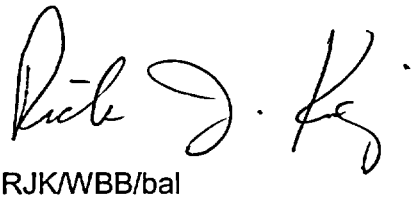
There are no technical changes proposed. The original no significant hazards considerations included in reference 1 is not affected by any information contained in the supplemental letter. There are no new commitments contained in this letter.

A-001

If you have any questions or require additional information, please contact Bill Brice at 601-368-5076.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 6, 2002 .

Sincerely,



RJK/WBB/bal
Attachment: Response to Request for Additional Information

cc: U. S. Nuclear Regulatory Commission
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Bcc:

File: G9.5, G9.42
File: LAR 2001-35
File: RBF1-02-0198

Attachment 1

To

RBG-46047

Response to Request for Additional Information

Response to Questions Concerning Testing Requirements for Reactor Coolant System Safety/Relief Valves for River Bend Station

In a letter dated May 14, 2002, the licensee requested a change to the plant technical specifications (TS) which included changing the Reactor Coolant System Safety Relief Valve (SRV) set point tolerances from +/-3% to +3%, -5%. The current +/-3% tolerance was approved generically by the Staff in a safety evaluation (SE) dated March 8, 1993, which documented the review of the topical report NEDC-31753P, submitted by the BWR Owners Group. The SE provides the basis for accepting the +/-3% SRV set point tolerance. The licensee has requested expanding the lower tolerance limit to -5%, citing operating experience with the installed SRVs wherein a few as-found set points were less than the current -3% lower limit. The licensee has provided an evaluation of the effect of the proposed -5% tolerance on the licensing-basis safety analysis. However, the staff has reviewed the licensee's proposal and has identified several issues as described below. The staff requests that the licensee address these issues relative to the proposed -5% SRV TS set point tolerance.

1) **In the review of the topical report NEDC-31753P, the staff found that a +/-3% tolerance would be appropriate, provided the affected portions of the plant-specific safety analysis are adequately addressed. No provision for a greater tolerance beyond this 3 % is given in the SE. The staff believes that the current 3% band is sufficiently large to accommodate SRVs which are performing adequately.**

Response:

The technical evaluation report (TER) prepared in support of the Staff's review of the referenced topical report recognizes that "the safety objective of the nuclear pressure relief system is to prevent overpressurization of the nuclear system." Because the upper tolerance limit protects this safety objective, the TER focuses on the upper tolerance and its relationship to the plant specific upper pressure limit. While there is considerable discussion of the upper tolerance, the justification for a lower limit is limited to a statement concerning "unnecessary challenges to safety systems".

While we agree with the philosophy of providing a lower limit, we believe that the -3% limit was chosen merely for consistency as it does not impact the ability of the SRV system to perform its safety objective. As long as the limit chosen does not "result in unnecessary challenges to safety systems", another limit can be justified. The proposed change was evaluated using the previously accepted methodology of the NEDC-31753P and the associated SER. The discussion on the "Impact on Operating Margin" as well as the discussion on pertinent system functions and responses in section 4.1 of Attachment 1 to our submittal discusses the effect of the -5% tolerance and concludes that there is adequate margin to prevent unnecessary challenges to the safety systems. This proposed change in tolerance has no physical effect on installed equipment in the plant.

2) The ASME OM Code does not permit relief valves to have as-found set points outside the +/-3% tolerance without corrective action. The licensee has had only a few (say how many and how much) occurrences of set point drift outside this tolerance band. The licensee's SRVs are not dissimilar to many others used in this service at other facilities. In fact, the licensee's SRVs have had good set point testing results, compared to some other model valves. Therefore, there does not appear to be a greater need for an expanded tolerance band to accommodate as-found set point values, compared to other facilities. Further, the staff views that a change to the lower set point tolerance would have generic implications and applicability. Such a change should result from a consensus standards development organization activity (i.e., ASME), if appropriate.

Response:

Although the ASME OM Code requires corrective action for as-found set pressures outside the valve's acceptance criteria, the licensee is permitted to establish acceptance criteria which may be outside the +/-3%. NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants", Section 4.3.9 provides clarification to be used by licensees when applying earlier versions of OM-1. Item # (2) a., of this section provides that the as-found set pressure will not exceed "the greater of either the +/- tolerance limit of the owner established set pressure acceptance criteria or +/-3% of valve nameplate set pressure." This position is based on clarifications that the OM working group incorporated into the 1994 addenda to the 1990 OM Code. Later editions of the Code include these clarifications. Additionally, as explained in the NUREG, because this is a clarification only, it can be used without further NRC approval. Entergy has applied this clarification and has documented it in the Inservice Testing (IST) Program.

Testing of the SRVs has historically been performed by replacing all 16 valves and after the refueling outage sending the removed valves to an off-site vendor for testing and maintenance in order to prepare them for replacement during the next refueling outage. With an emphasis on reducing personnel radiation exposure and the potential for human performance errors, this practice is no longer desirable. It is recommended that a sample of the SRVs be removed each outage and tested for as-found conditions in accordance with ASME Section XI requirements as defined in ASME OM, Part 1 in lieu of replacing all 16 valves. However, it is required that if a valve exceeds its as-found set pressure tolerance, additional valves must be removed and tested prior to resumption of power on the basis of 2 additional valves for each valve exceeding its tolerance. If the as-found set pressure of any valve was found to be between -3% and -5%, this additional work would increase costs and personnel exposure, introduce potential human performance errors and could potentially extend the refueling outage without a commensurate increase in safety.

Based on historical as-found test data, the SRVs experience minor setpoint drift in the negative direction. The current as-found set pressure tolerance does <u>not</u> provide adequate margin to support a sampling program without a high potential for having to remove and test additional valves. Out of 49 as-found set pressure tests of valves with the current design, 11 valves were found to be more than -3% below their respective nameplate set pressure. However, these valves were originally set to an as-left tolerance of +0, -2% as required by our Technical Specification at the time. In order to determine the actual amount of drift, the as-found test results were compared

to the average of the last four as-left actuations from the previous test results. This reduced the number of valves that drifted more than -3% from 11 to 5 as shown on the tables below. The Technical Specification has been changed to require that the SRVs be returned to a set pressure of +/-1% of the nameplate set pressure prior to installation. Failure of 5 out of 49 tests equates to a failure rate of 10.2 %, which remains unacceptably high, and prohibits placing the SRVs on a test-sampling program when considering the potential impact of a test failure. Entergy is striving to reduce or eliminate unanticipated equipment failures, which includes test failures. As shown in testing and concluded in Section 4.1 of attachment 1 to our submittal, the proposed expanded as-found tolerance would support this goal for the SRVs without impacting safety or installed plant equipment, and will not impact the manner in which the SRVs are operated.

Serial Number	Set Pressure (SP) (psig)	Test Date	As-Found SP Test Data (psig)	Deviation from Nominal SP
N63800-02-0107	1165	08/18/1998	1125	-3.4%
N63800-02-0120	1190	08/27/1998	1141	-4.1%
N63800-02-0037	1165	03/28/2000	1127	-3.3%
N63800-02-0041	1180	03/27/2000	1141	-3.3%
N63800-02-0044	1180	02/14/2000	1140	-3.4%
N63800-02-0045	1180	03/30/2000	1143	-3.1%
N63800-02-0100	1180	07/09/2001	1122	-4.9%
N63800-02-0117	1190	03/22/2000	1139	-4.3%
N63800-02-0106	1165	09/09/2002	1106	-5.1%
N63800-02-0112	1165	09/08/2002	1120	-3.9%
N63800-02-0121	1190	09/10/2002	1134	-4.7%

Serial Number	Set Pressure (SP) (psig)	Previous As-left Test Data (psig)	As-Found SP Test Data (psig)	Deviation from Previous As-Left Test
N63800-02-0107	1165	1160	1125	-3.02%
N63800-02-0120	1190	1175.5	1141	-2.93%
N63800-02-0037	1165	1154.5	1127	-2.38%
N63800-02-0041	1180	1169.2	1141	-2.41%
N63800-02-0044	1180	1173.2	1140	-2.83%
N63800-02-0045	1180	1167.7	1143	-2.11%
N63800-02-0100	1180	1176.7	1122	-4.65%
N63800-02-0117	1190	1174	1139	-2.98%
N63800-02-0106	1165	1149.2	1106	-3.76%
N63800-02-0112	1165	1159.5	1120	-3.41%
N63800-02-0121	1190	1178.2	1134	-3.75%

3) **The licensee proposes to reset the SRVs to within +/-1% of the nominal set points if they are found outside +/-1%. While increasing the lower SRV as-found set point tolerance limit may not appear to directly affect the performance of the SRV components, there may be a longer-term tendency to provide less corrective action for valves which tend to drift in the lower direction, if a lower tolerance limit is allowed. One of the concerns relative to lower set points is that there would be a lower simmer margin for the SRVs. With lower simmer margin, there is increased tendency for seat leakage, which can erode the valve seat and increase the leakage further over time. There have been several occurrences of SRV leakage great enough to cause significant suppression pool heating. As a result, there have been several occurrences where RHR suppression pool cooling has been used to cool the pool to maintain allowable pool temperatures. With the RHR system in this mode, there is a much greater likelihood of a RHR system waterhammer following a loss-of-coolant accident. This scenario is discussed in Information Notice 87-10, Supplement 1 dated May 15, 1997. As discussed therein, there have been several occurrences of excessive use of RHR pool cooling while the plant is operating, and any increased tendency of the SRVs to leak could increase the use of the RHR system for pool cooing and the likelihood of a damaging waterhammer. The proposed higher SRV as-found set point tolerance will create additional SRV leakage to the suppression pool.**

Response:

Valves that are found outside of the as-found set pressure tolerance limits of +3, -5% will be treated exactly as they are now. OM-1 requires that the cause of failure be determined and corrected. All valves found to be outside the tolerance of +/-1% will be reset to within this limit prior to being installed. It is our intent to replace valves that experience seat leakage. Seat leakage through these valves cause many problems such as adding heat to the containment, higher dose rates in containment, contamination in the suppression pool and unnecessary operation of suppression pool cooling systems. Leakage can also result in higher maintenance costs. Therefore, it is in our interest to eliminate any valve leakage. In 1995, an improved seat design modification was implemented on the SRVs which has dramatically improved seat leakage over the plant operating cycle. We have no reason to believe seat leakage will increase over time due to set pressure drift as the number of as-found set pressure failures actually decreased from 5 in year 2000 to 3 in year 2002. The valves tested in 2000 had been in service for one operating cycle (18 months), whereas the valves tested in 2002 were in service for two operating cycles (approximately 27 months due to a shortened operating cycle).

IN 87-10, Supplement 1 (the IN) was issued to address the potential for water hammer in the residual heat removal (RHR) system of BWRs during a design-basis loss-of-coolant accident (LOCA) coincident with a loss of offsite power (LOOP) if the RHR system is aligned in the suppression pool cooling (SPC) mode of operation. This supplement also addresses the increased use of RHR pumps in the SPC mode due to leaking SRVs.

RBS has limited potential to develop water hammer in the RHR systems that are capable of supporting suppression pool cooling because these systems use keep-fill pumps to ensure that water pressure is maintained in the system at all times. These pumps are powered from the associated emergency diesels. In addition, there is an alarm that alerts the operators if pressure is not adequately maintained in the system. If the operators are unable to maintain pressure, they would then declare the system inoperable, enter the appropriate LCO, and open the main pump breaker to ensure the pump will not start. This prevents water hammer as discussed in the IN.

General Electric (GE) issued a report (NEDC-32513) for the Boiling Water Reactor (BWR) Owners' Group to address the concerns identified in the IN. The report concluded the probability of occurrence of a LOCA and a LOOP concurrent with the use of SPC "within a short time span is considerably less than the probability at which the original design would have considered per ASNSI/ANS 52.1." The report also noted that the probability of occurrence of the postulated design basis combined event scenario that leads to water hammer is extremely low (lower than 10^{-6}/Yr.)

RBS also has a separate suppression pool cooling system (USAR 9.3.8) that provides cooling to the suppression pool. This system is not an ESF system and is intended to be used for normal pool cooling (e.g., SRV leakage or testing that might add heat to the pool). This limits the use of the RHR suppression pool cooling function and precludes the water hammer issue discussed above during its use.