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RBG-45952

May 14, 2002

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: River Bend Station, Unit 1
NPF-47
One-time Extension of the Integrated Leak Rate Test Interval
License Amendment Request, LAR 2002-16

Dear Sir or Madam:

Pursuant to 10CFR50.90, Entergy Operations, Inc. (Entergy) requests an amendment for River Bend Station, Unit 1 (RBS) to change administrative Technical Specification 5.5.13 regarding Containment Integrated Leak Rate Testing (ILRT). The change clarifies the statement that the ILRT Program is in accordance with Regulatory Guide 1.163 by noting an exception taken to the interval guidance in NEI 94-01, Revision 0. The effect of this change will be the allowance of an extended interval (15 years) for performance of the next ILRT. In accordance with recent practice for similar submittals, this request is made for a one-time extension of the interval.

This request is made on a risk-informed basis as described in Regulatory Guide 1.174. The attached technical justification for this request provides a risk evaluation using a methodology that has been found acceptable for other similar requests.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1) using criteria in 10CFR50.92(c) and it has been determined that this change involves no significant hazards considerations. The basis for this determination is included in the attached submittal.

Entergy Operations, Inc. requests that the effective date for this Technical Specification change to be within 30 days of approval. Although this request is neither exigent nor emergency, your prompt review is requested. RBS has identified this change as affecting activities planned during the upcoming refueling outage (RF11) and on that basis requests approval of this proposed change by January 31, 2003. The requested approval date and implementation period will enable RBS to optimize refueling outage planning and activities. This request will save critical path time in the RF11 outage and permit the deferral of the ILRT until a subsequent outage.

The proposed change does not include any new commitments. If you have any questions or comments concerning this request, please contact Jerry Burford at (601) 368-5755.

A017

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 14, 2002.

Sincerely,

P. D. Hinnenkamp
Vice President, Operations
River Bend Station, Unit 1

PDH/FGB

Attachments:
1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)

cc: U. S. Nuclear Regulatory Commission
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Attachment 1

RBG-45952

Analysis of Proposed Technical Specification Change

1.0 DESCRIPTION

This letter is a request to amend Operating License NPF-47 for River Bend Station, Unit 1 (RBS) .

The proposed change will revise the RBS Administrative Technical Specification for the Reactor Building Leak Rate Testing Program to add an exception to the commitment to follow the guidelines of Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program." The effect of this request will be a one-time extension of the interval since the last ILRT from 10 years to 15 years.

2.0 PROPOSED CHANGE

The proposed change will revise the RBS Administrative Technical Specification 5.5.13 to add an exception to the commitment to follow the guidelines of Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program." The exception is taken to the interval guidance in NEI 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J." The NEI document is endorsed in the regulatory guide. The effect of this request will be an extension of the test interval from 10 years to 15 years.

RBS proposes to revise TS 5.5.13 of the improved Technical Specifications by revising the second sentence from:

> This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program, " dated September 1995.
>
> to:
>
> This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program, " dated September 1995, except that the next Type A test performed after the August 15, 1992 Type A test shall be performed no later than August 14, 2007.

Regulatory Guide 1.163 endorses NEI 94-01, Revision 0 (1995), which in turn references ANSI/ANS-56.8-1994, "Containment System Leakage Testing Requirements." However, as stated in NEI 94-01, the test intervals in ANSI/ANS 56.8-1994 are not performance-based. Therefore, licensees intending to comply with Option B in the amendment to Appendix J should establish test intervals based upon the criteria in NEI 94-01, rather than using the test intervals specified in ANSI/ANS-56.8-1994.

In summary, the proposed change would represent a one-time deferral of the ILRT of up to five additional years. There are no changes required to the Technical Specification Bases associated with this change.

3.0 BACKGROUND

A Type A test is an overall (integrated) leakage rate test of the containment structure. NEI 94-01 specifies an initial test interval of 48 months, but allows an extended interval of 10 years, based upon two consecutive successful tests. There is also a provision for extending the test interval an additional 15 months consistent with standard scheduling practices for Technical Specification surveillance requirements. The two most recent Type A tests at RBS have been successful, so the current test interval is 10 years. There have been no modifications since the last test made to containment that would impact the leaktightness of the structure itself.

Integrated Leak Rate Tests (ILRTs) have been required of operating nuclear plants to ensure the public health and safety in the event of an accident that would release radioactivity into the containment. Conservative design and construction practices have led to very few ILRTs exceeding their required acceptance criteria. The NRC has extended the allowable test frequency from three times in ten years to once in ten years on a performance basis. This change was based on NUREG 1493, "Performance Based Containment Leak-Test Program," dated September, 1995. The NUREG stated that an interval between tests of up to twenty years would contribute an imperceptible increase in risk.

RBS has performed three ILRTs during the period of its Operating License. The two most recent ILRTs were performed in August 1992 and May 1989. These tests were successful and on this basis, RBS currently has a ten-year interval in which to perform the next ILRT. Without this change, RBS, utilizing the NEI 94-01 provision allowing an interval extension of up to 15 months, would plan to perform the next ILRT during the upcoming outage in March, 2003. Structural degradation of containment is a gradual process that occurs due to the effects of pressure, temperature, radiation, chemical, or other factors. Such effects are identified and corrected when the containment is periodically inspected to verify structural integrity under the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI (ASME XI), Subsection IWE.

Entergy is also aware of the discussion between the NRC and NEI concerning a possible permanent extension of the ILRT test interval. The basis for the discussions derives not only from the discussion in NUREG 1493, but also from that in EPRI TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Test Intervals." The one-time change requested here will defer the immediate need for the test and should permit consideration of any agreements reached on the generic change through a revision of NEI 94-01.

4.0 TECHNICAL ANALYSIS

The proposed change to extend the current ILRT interval is justified based on a combination of risk-informed analysis and a history of successful Type A tests. The risk aspects of the justification have been evaluated as presented below.

The results of the risk evaluation demonstrate that the increase in risk of extending the ILRT interval from 10 to 15 years is insignificant. That analysis, done in accordance with Regulatory Guide (RG) 1.174, shows that the increase in total plant risk due to the extended ILRT interval is well under one-half of one per-cent. The change in the Large Early Release Frequency (LERF) is only 1.0E-8 for an increase from 10 years to 15 years. This is consistent with the findings of NUREG-1493, "Performance-Based Containment Leak-Test Program," September, 1995. However, this submittal requests only a one-time interval extension from 10 years to 15 years.

In summary, the risk assessment demonstrates:

1. The risk of extending the ILRT interval for Type A tests from its current interval of 10 years to 15 years was evaluated for potential public exposure impact (as measured in person-rem/year). The risk assessment predicts a slight increase in risk when compared to that estimated from current requirements. For the change from a 10-year test interval to a 15-year test interval, the increase in the risk (person-rem/year within 50 miles) was found to be 0.10 percent. Note that the cumulative increase in risk, given the change from the original frequency of three tests in 10 years to a 15-year test interval, was found to be 0.32 percent. This is just slightly greater than the range of risk increase, 0.02 to 0.14 percent, estimated in NUREG-1493 when going from the three tests in 10 years test frequency to a 10-year test interval. NUREG-1493 concluded this represents an imperceptible increase in risk. Changes that result in an increase in risk of less than 1% are typically considered insignificant. Therefore, the increase in the risk for the proposed change is considered small.

2. RG 1.174 provides guidance for determining the risk impact of plant-specific changes to the licensing basis. RG 1.174 defines very small changes in the risk guidelines as increases in CDF less than 1E-6 per reactor year and increases in LERF less than 1E-7 per reactor year. Since the Type A test does not impact CDF, the relevant criterion in evaluating this proposed change is LERF. The increase in LERF resulting from a change in the Type A test frequency from the current one test in 10 years to one test in 15 years is estimated to be 1.0E-8/year. The cumulative increase in LERF resulting from a change in the Type A test interval from the original three tests in 10 years to one test in 15 years is estimated to be 3.0E-8/year. Increasing the Type A interval to 15 years is considered to be a very small change in LERF.

3. RG 1.174 also encourages the use of risk analysis techniques to help ensure and show that the proposed change is consistent with the defense-in-depth philosophy. Consistency with the defense-in-depth philosophy is maintained if a reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation. The change in the conditional containment failure probability was estimated to be 0.10 percent for the proposed change and 0.32 percent for the cumulative change of going from a test frequency of three tests in 10 years to one test in 15 years. Thus, it is concluded that the very small impact

on the conditional containment failure probability demonstrates that consistency with the defense-in-depth philosophy is maintained for the proposed change.

Discussion of Containment In-Service Inspection Program

Containment leak-tight integrity is also verified through periodic in-service inspections conducted in accordance with the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI. More specifically, Subsection IWE provides the rules and requirements for in-service inspection of Class MC pressure-retaining components and their integral attachments in light-water cooled plants. Furthermore, NRC regulation 10CFR50.55a(b)(2)(ix)(E) requires licensees to conduct a general visual inspection of the containment in accordance with ASME XI during each 10-year interval. And, inspections required by the Maintenance Rule (10CFR50.65) may also identify containment degradation that could affect leaktightness. These requirements will not be changed as a result of the extended ILRT interval. In addition, Appendix J, Type B local leak rate tests performed to verify the leak-tight integrity of containment penetration bellows, airlocks, seals, and gaskets are not affected by this proposed change to the Type A test frequency. The NRC has requested additional information regarding containment in-service inspection from previous applicants for similar changes. The requested information is addressed below.

1. None of the references describe (or summarize) the containment ISI program being implemented at [RBS]. Please provide a description of the ISI methods that provide assurance that in the absence of an ILRT for 15 years, the containment structural and leak tight integrity will be maintained.

   Response for RBS –

   The Containment Inservice Inspection (CII) program at RBS is described in detail in CEP-CII-006, "Containment Inservice Inspection (CII) Program Plan." This plan was developed in accordance with the requirements of ASME Section XI, Subsection IWE, 1992 edition with 1992 addenda as modified by 10CFR50.55a. The program requirements include a general visual examination of one containment surface each three-year inspection period. The general visual examinations are conducted in accordance with STP-057-3700, "Steel Containment Vessel General Visual Examination." Any indications exceeding the screening criteria contained in CEP-CII-006 are provided to a qualified structural engineer who compares the indication to the design requirements of the containment vessel. Any indications that exceed the design requirements are documented in the Corrective Action Program and are dispositioned in accordance with the ASME code requirements. In addition to providing screening criteria, CEP-CII-006 also provides the qualification requirements for personnel conducting general visual examinations. The program currently requires VT examinations of bolted connections as detailed in CEP-CII-006. Revisions to the CII program are anticipated and will comply with the regulatory requirements, including provisions for relief and alternative examinations, of 10CFR50.55a.

   In addition to the implementation of ASME XI, Subsection IWE requirements as mentioned above, RBS also performs Appendix J inspections of BOTH surfaces of the containment vessel three times in every ten-year inspection interval. The latest inspection (March 2000) results indicate that BOTH sides of the containment vessel were in good condition.

2. IWE-1240 requires licensees to identify the surface areas requiring augmented examinations. Please provide the locations of the containment liner surfaces that have been identified as requiring augmented examination and a summary of the findings of the examinations performed.

   Response for RBS –

   There are currently no augmented examinations required for RBS.

3. For the examination of seals and gaskets, and examination and testing of bolts associated with the primary containment pressure boundary (Examination Categories E-D and E-G), relief from the requirements of the Code had been requested. As an alternative, it was proposed to examine them during the leak rate testing of the primary containment. However, Option B of Appendix J for Type B and Type C testing (as per Nuclear Energy Institute 94-01 and Regulatory Guide 1.163), and the ILRT extension requested in this amendment for Type A testing provide flexibility in the scheduling of these inspections. Please provide your schedule for examination and testing of seals, gaskets, and bolts that provide assurance regarding the integrity of the containment pressure boundary.

   Response for RBS -

   The NRC issued relief authorization for alternatives to the requirements of ASME Section XI, as endorsed by 10CFR50.55a for Containment Inspections for Arkansas Nuclear One, Units 1 & 2, Grand Gulf Nuclear Station, River Bend Station, and Waterford Steam Electric Station, Unit 3 on January 13, 2000. The relief authorization approved the use of existing 10CFR50, Appendix J Type B testing as a verification of containment integrity, rather than disassembling the subject components for the sole purpose of examination. As stated in the relief authorization requests (ISI Relief Request IWE-03 for seals and gaskets and ISI Relief Request IWE-02 for examination and testing of bolt torque and tensioning), the alternate examinations of Appendix J Type B testing will be performed at least once during each Containment Inspection interval. Thus, the proposed interval extension for the Type A test (ILRT) does not affect the frequency of these alternate examinations since they will be performed once in each ten-year inspection interval.

   NEI 94-01 describes the Type B testing frequencies in paragraphs 10.2.1 and 10.2.2. The extended test interval for Type B penetrations (except containment airlocks) is up to a maximum of once per 120 months. The test frequency for airlocks, and penetrations with resilient seals are to be tested at a frequency of once per 30 months.

   RBS Technical Specification 5.5.13 states "This (Appendix J) program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, Performance-Based Containment Leak-Test Program, dated September 1995", which endorses NEI 94-01. The extension of the interval for conducting the Type A test (ILRT) will not modify the schedule for completion of any other examination or test.

4. The stainless steel bellows have been found to be susceptible to trans-granular stress corrosion cracking, and the leakage through them are not readily detectable by Type B testing (see Information Notice 92-20). If applicable, please provide information regarding inspection and testing of the bellows, and how such behavior has been factored into the risk assessment.

   Response for RBS –

   RBS utilizes expansion bellows on 20 containment penetrations. These bellows are subject to local leak rate testing by pressurizing the space between the plies of the bellows. Leakage across the bellows is detectable by Type B testing. Leakage was determined to occur across either ply of the bellows and this has been accounted for in the surveillance test procedures since 1995. Two of the bellows have been found with minor flaws. The leakage from these bellows has remained essentially the same since discovery of the flaws in 1992. These penetrations have been evaluated and the administrative leakage acceptance limits revised. The administrative limit for 18 of the 20 bellows is 20 sccm; the limits for the other two bellows are 65 sccm and 88 sccm. The leakage from these penetrations is then summed with leakage from all of the other penetrations. The total leakage has remained well below the 10CFR50, Appendix J leakage limit.

5. Inspections of some reinforced concrete and steel containment structures have found degradation on the uninspectable (embedded) side of the drywell steel shell and steel liner of the primary containment. These degradations cannot be found by visual (i.e., VT-1 or VT-3) examinations unless they are through the thickness of the shell or liner, or, 100% of the uninspectable surfaces are periodically examined by ultrasonic testing. Please provide information addressing how potential leakage under high pressure during core damage accidents is factored into the risk assessment related to the extension of the ILRT.

   Response for RBS –

   The potential for containment leakage is explicitly included in the risk assessment. By definition, the intact containment cases, EPRI Containment Failure Class 1, include a leakage term that is independent of the source of the leak. Similarly, the Containment Failure Class 3a and 3b cases model the potential leakage impact of the ILRT interval extension. These cases include the potential that the leakage is due to a containment shell failure. The assessment shows that even with the increased potential to have an undetected containment flaw or leak path, the increase in risk is insignificant.

Discussion of Risk Impact Evaluation

Entergy recognizes that the NRC Staff has indicated a preference for the risk analysis to utilize a methodology similar to that now approved for the Crystal River 3 application. The evaluation described below utilized that methodology. RBS has also performed a sensitivity analysis to compare the results using the previously approved methodology with those performed consistent with our typical PSA practices. The previously approved methodology utilizes a 95th percentile estimate of the probability of the containment failures of interest and a simplifying assumption for the impact of the extended interval. The sensitivity analysis uses a more reasonable assessment of the frequency of the Class 3 containment failure states and a more conservative treatment of the impact of the extended interval. The change is demonstrated to be risk insignificant in both methodologies.

Both of the methodologies followed the same general approach to the evaluation of the risk of the interval extension. The methodologies:

- both utilize the EPRI TR-104285 release classes to categorize the various containment failure scenarios.
- both establish the plant-specific frequencies for each EPRI release class.
- both define estimated leakage for each release class.
- both quantify the risk for each release class by multiplying the class frequency times the assumed leakage.
- both evaluated three ILRT intervals: a baseline case (3 tests in 10 years), a current case (1 test in 10 years), and the proposed case (1 test in 15 years).

Evaluation Methodology

The plant-specific risk impact for each ILRT interval was evaluated using the previously approved methodology. The following steps have been used to analyze the risk impact of extending the ILRT test interval.

1. Obtain the source term category (STC) quantification from the RBS Level 1 model and classify the existing STCs into the EPRI failure classes.
2. Calculate the frequency for the EPRI class events affected by new ILRT frequency – i.e., Class 3a, Class 3b, and Class 1.
3. Calculate the man-rem/yr values for all of the classes
4. Calculate the increase in undetected leakage frequencies attributable to the extension in ILRT test interval.
5. Using the new frequencies calculate the change in risk, LERF, and Conditional Containment Failure Probability.

Table 1 summarizes the treatment of each of the EPRI Release Classes and provides a summary of some of the differences between the Entergy and the previously approved methodologies. Table 2 presents a summary listing of the Source Term Categories (STC) taken from the RBS Level 1 analysis and categorizes each STC into its appropriate EPRI release class.

Table 1
EPRI Release Class Summary

Release Class	Description	Previously Approved Approach	Entergy Method
1	No containment failure	Frequency reduced as Class 3 increases; considered leakage of L_a	Frequency reduced as Class 3 increases; considered leakage of L_a
2	Dependent or common cause failures – Large isolation failures	No change from baseline consequence measures; dose values derived from RBS level 2 analysis	No change from baseline consequence measures; dose values derived from RBS level 2 analysis
3	Independent isolation failures (detected by Type A test)	3a: small leaks, 10 L_a, non-LERF (Large Early Release Frequency) 3b: large leaks, 35 L_a, LERF probability derived using total CDF and 95th %-ile χ^2 distribution of NUREG 1493	3a: small leaks, non-LERF; 3b: large leaks, LERF; probability derived based on non-LERF CDF and 95th %-ile χ^2 distribution of NUREG 1493; dose values derived from RBS level 2 analysis
4,5	Independent isolation failures (detected by Type B or C test)	No change from baseline consequence measures; not analyzed	No change from baseline consequence measures; not analyzed
6	Other isolation failures not in Category 2	No change from baseline consequence measures; dose values derived from RBS level 2 analysis	No change from baseline consequence measures; dose values derived from RBS level 2 analysis
7	Induced failures	No change from baseline consequence measures; dose values derived from RBS level 2 analysis	No change from baseline consequence measures; dose values derived from RBS level 2 analysis
8	Bypass	No change from baseline consequence measures – not impacted by ILRT extension; consequences included in Classes 2 and 6	No change from baseline consequence measures – not impacted by ILRT extension; consequences included in Classes 2 and 6

Note – The descriptions of the release classes above are based on the definitions provided in EPRI TR-104285.

Table 2
RBS Source Term Category (STC) Summary

Source Term Category	STC Description	EPRI Class	Comments
STC 54	Late gross failure: - debris not cooled in-vessel - drywell fails - suppression bypassed - debris not cooled ex-vessel	7	N/A
STC 60	No containment failure: - debris cooled in-vessel - drywell remains intact - suppression pool saturated	1	N/A
STC 18	No containment failure: - debris cooled in-vessel - drywell remains intact - suppression pool subcooled	1	N/A
STC 50	Early containment failure – containment vented: - debris not cooled in-vessel - drywell remains intact - suppression pool saturated - suppression bypassed - debris not cooled ex-vessel	7	N/A
STC 22	Late large failure: - debris not cooled in-vessel - drywell intact - suppression pool subcooled - debris not cooled ex-vessel	7	N/A
STC 23	Late penetration failure: - debris not cooled in-vessel - drywell intact - suppression pool subcooled - debris not cooled ex-vessel	7	N/A
STC 34	Late anchor dome failure: - debris not cooled in-vessel - drywell remains intact - suppression pool is saturated - debris not cooled ex-vessel	7	N/A
STC 76	Late gross failure: - debris not cooled in-vessel - drywell remains intact and suppression pool is subcooled - debris not cooled in-vessel	7	N/A

Source Term Category	STC Description	EPRI Class	Comments
STC 72	No containment failure: - debris not cooled in-vessel - drywell remains intact and suppression pool is subcooled - debris is cooled ex-vessel	1	N/A
STC 35	Late penetration failure: - debris not cooled in-vessel - drywell remains intact - suppression pool is saturated - debris not cooled ex-vessel - failure cause by hydrogen detonation or large burn	7	N/A
STC 77	Late penetration failure: - debris not cooled in-vessel - drywell remains intact and suppression pool is subcooled - debris not cooled ex-vessel - failure cause by hydrogen detonation or large burn	7	N/A
STC 6	No containment failure: - debris cooled in-vessel - drywell remains intact - suppression pool subcooled	1	N/A
STC 52	Early Penetration Failure – Containment not isolated - debris not cooled in-vessel - suppression pool bypassed - suppression pool saturated - debris not cooled ex-vessel	6	48% of containment isolation failures are small failures
STC 66	No containment failure: - debris cooled in-vessel - drywell remains intact - suppression pool saturated	1	Like STC 60
STC 84	No containment failure: - debris cooled in-vessel - drywell remains intact and suppression pool is subcooled - debris is cooled ex-vessel	1	Like STC 72
STC 86	Early Penetration Failure – Containment not isolated - debris not cooled in-vessel - suppression pool not bypassed - suppression pool saturated - debris cooled ex-vessel	6	Like STC 52

Source Term Category	**STC Description**	**EPRI Class**	**Comments**
STC 88	Late anchor dome failure: - debris not cooled in-vessel - drywell remains intact - suppression pool is saturated - debris not cooled ex-vessel	7	Like STC 34
STC 89	Early Penetration Failure – Containment not isolated - debris not cooled in-vessel - suppression pool bypassed - suppression pool saturated - debris not cooled ex-vessel	6	Like STC 52
STC 100	Late gross failure: - debris not cooled in-vessel - drywell fails - suppression bypassed - debris not cooled ex-vessel	7	Like STC 54 or STC 34
LERF STCs			
STC 97	Early Gross Failure - debris not cooled in-vessel - suppression pool bypassed - suppression pool subcooled - debris not cooled ex-vessel	7	N/A
STC 31	Early Gross Failure - debris not cooled in-vessel - suppression pool bypassed - suppression pool saturated - debris not cooled ex-vessel	7	N/A
STC 52	Early Gross Failure – Containment not isolated - debris not cooled in-vessel - suppression pool bypassed - suppression pool saturated - debris not cooled ex-vessel	2	52% of isolation failures are large failures
STC 104	Early Gross Failure – Containment not isolated -SBO - debris not cooled in-vessel - suppression pool bypassed - suppression pool saturated - debris not cooled ex-vessel	7	N/A

Note - These STCs are considered significant in the current Level 1 and 2 analyses. Other STCs have been analyzed, but they were found to be minimal (i.e., non-significant; less than 1% of risk combined).

The current RBS Level 2 analysis (i.e., STC frequencies) is based on Rev. 2D of the Level 1 analysis. The latest revision to the Level 1 analysis is Rev. 3 (implemented in 2001). The core damage frequency increased by approximately 300% from Rev. 2D to Rev. 3. In past submittals (e.g., IFTS Blind Flange Removal) that concerned Level 2 analysis, the effect of the Level 1 revision on the Level 2 analysis was estimated using engineering judgment. However, since this evaluation also determined the change in risk (i.e., person-rem), the effect of the Level 1 on each STC frequency was explicitly evaluated for this submittal. This evaluation showed an increase in LERF and conditional containment failure similar to the increase in CDF. These revised STC frequencies were used to evaluate the effect of increasing the ILRT testing frequency. It should also be noted that the Level 1 analysis is again in the process of being revised to Rev. 3A in support of the RBS diesel generator AOT extension. This revision credits convolution and reduces the core damage frequency from 9.446E-6/yr to 3.39E-6/yr. This new revision of the Level 1 analysis was not used in this evaluation since the CDF, and thus LERF and CCDP, are significantly lower than that in the Rev. 3 CDF. Thus, the results below are conservative with respect to the new revision.

Evaluation of Baseline ILRT Interval (3 tests in 10 years)

The risk results of this evaluation for the baseline case are presented in Table 3. The baseline interval is based on the original frequency of three tests in 10 years. The release frequencies for the Class 2, 6, and 7 bins (Class 8 events are included in the other Class data) are taken from the RBS Level 1 analysis. As noted in Table 1, the risk associated with the Class 4 and 5 bins is not impacted by the ILRT interval and is not analyzed here. The release frequencies for the Class 3a and 3b bins are determined based on the previously approved methodology (see next paragraph). The release frequency for Class 1 is the value of core damage frequency (CDF) reduced by the frequencies of the Class 3a and 3b scenarios. The overall core damage frequency for RBS is 9.446E-06/yr (based on Revision 3 of the Level 1 analysis discussed above). Based on the STCs binned in the no containment failure class (EPRI class 1), the initial frequency for this class is 1.01E-06/yr (this is essentially the CDF for intact containment.)

The Class 3a and 3b frequencies in the previously approved methodology were determined based on a 95^{th} percentile χ^2 distribution of the NUREG-1493 data. For the baseline ILRT interval (3 tests in 10 years), this resulted in a frequency for Class 3a of 0.064 times CDF and a frequency for Class 3b of 0.021 times CDF. These frequencies are used in the analysis presented in Table 3.

Table 3
RBS Risk Evaluation of Baseline ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	CDF intact - freq(3a)-freq(3b) = 2.07E-07	L_a: 3.46E+05	0.0716
2	1.35E-09	2.16E+08	0.292
3a	0.064 x CDF = 6.05E-07	10 L_a : 3.46E+06	2.09
3b	0.021 x CDF = 1.98E-07	35 L_a : 1.21E+07	2.40
6	1.07E-06	4.91E+07	52.54
7	7.37E-06	1.98E+07	145.93
8	included above	n/a	n/a
		Total Risk	203.32

Using the previously approved methodology, the risk contribution due to the ILRT Type A testing is considered to be due to the Class 3a and 3b scenarios. From Table 3, it can be seen that the risk contribution associated with the ILRT testing interval considering Classes 3a and 3b is:

$$\% \text{ Risk} = [(\text{Risk}_{\text{Class 3a}} + \text{Risk}_{\text{Class 3b}}) / \text{Total Risk}] \times 100$$

$$= [(2.09 + 2.40) / 203.32] \times 100$$

$$= 2.21\%$$

Since the Type A test does not impact CDF, the relevant criterion in evaluating this proposed change is LERF. In the determination of the impact of the change in the ILRT test interval on the Large Early Release Frequency (LERF), the previously approved methodology focuses only on the Class 3b scenario, which is the only LERF contributor affected by the consideration of the ILRT interval. Thus, for this analysis, the baseline LERF is the Class 3b frequency, or 1.98E-07.

Risk Evaluation of the Current ILRT Interval (1 test in 10 years)

This analysis of the current 'once in 10 years' interval is performed using the same approach taken above for the baseline case. The frequencies for all release classes, except Class 1, 3a, and 3b, are unaffected by the change in the interval and remain as in Table 3. The releases for all of the classes are the same as those shown in Table 3 for the baseline case.

The increased probability of not detecting excessive leakage in a Type A test directly impacts the frequencies of the Class 3 events. In the previously approved methodology, the Class 3a and 3b frequencies are determined by multiplying the baseline frequency by a factor of 1.1. This same factor is used in this analysis to be consistent with the previously approved methodology. With this change in the Class 3 frequencies, the Class 1 frequency is also adjusted to preserve the total CDF. The evaluation of the current interval is presented in Table 4.

Table 4
RBS Risk Evaluation of Current ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	CDF intact - freq(3a)-freq(3b) = 1.26E-07	L_a : 3.46+05	0.0436
2	1.35E-09	2.16E+08	0.292
3a	0.064 x CDF = 6.66E-07	10 L_a : 3.46E+06	2.30
3b	0.021 x CDF = 2.18E-07	35 L_a : 1.21E+07	2.64
6	1.07E-06	4.91E+07	52.54
7	7.37E-06	1.98E+07	145.93
8	included above	n/a	n/a
		Total Risk	203.74

As was noted above for the baseline evaluation:

- the risk contribution due to the Type A test interval is [(2.30 + 2.64) / 203.74] x 100, or 2.42%.
- the LERF for the current interval evaluation is the Class 3b frequency, or 2.18E-07.

Risk Evaluation of the Proposed ILRT Interval (1 test in 15 years, one-time)

This analysis of the proposed 'once in 15 years' interval utilized the same approach as taken above for the baseline case. The frequencies for all release classes, except Class 1, 3a, and 3b, are unaffected by the change in the interval and remain as in Table 3. The releases for all of the classes are the same as those shown in Table 3 for the baseline case.

The increased probability of not detecting excessive leakage in a Type A test directly impacts the frequencies of the Class 3 events. Based on the previously approved methodology, the Class 3a and 3b frequencies are determined by simply multiplying the baseline frequency by a factor of 1.15. With this change in the Class 3 frequencies, the Class 1 frequency is also adjusted to preserve the total CDF. The evaluation of the proposed interval is presented in Table 5.

Table 5
RBS Risk Evaluation of Proposed ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	CDF intact - freq(3a)-freq(3b) = 8.70E-07	L_a : 3.46+05	0.301
2	1.35E-09	2.16E+08	0.292
3a	0.064 x CDF = 6.95E-07	10 L_a : 3.46E+06	2.40
3b	0.021 x CDF = 2.28E-07	35 L_a : 1.21E+07	2.76
6	1.07E-06	4.91E+07	52.54
7	7.37E-06	1.98E+07	145.93
8	included above	n/a	n/a
		Total Risk	204.22

As was noted above for the baseline evaluation:

- the risk contribution due to the Type A test interval is [(2.40 + 2.76) / 204.22] x 100, or 2.53%.
- the LERF for the current interval evaluation is the Class 3b frequency, or 2.28E-07.

Conditional Containment Failure Probability

Another parameter of interest in evaluating the risk impact of a change to the ILRT interval is the conditional containment failure probability (CCFP). Based on the previously approved methodology used in this sensitivity risk analysis, CCFP is defined as:

CCFP = 1 – (frequency of no containment failure sequences / CDF)

Further, the sequences representing no containment failure were considered to be the Class 1 and 3a events since these classes represent very small leakage rates consistent with the previously approved methodology. Thus, using this approach and the information from Tables 3, 4, and 5, the ΔCCFP for RBS may be derived as shown below. (note – the subscripts used represent the interval: b-baseline, c-current, p-proposed)

$$\Delta CCFP_{c\ to\ p} = \{[freq\ (Cl1) + freq\ (Cl3a)]_c - [freq\ (Cl1) + freq\ (Cl3a)]_p\} / CDF$$

$$= \{[1.26E\text{-}07 + 6.66E\text{-}07] - [8.70E\text{-}08 + 6.95E\text{-}07]\} / 9.446E\text{-}06$$

$$= 0.00095, \text{ or } 0.10\%$$

Similarly, the impact of the proposed interval compared to the baseline case is given by:

$$\Delta CCFP_{b\ to\ p} = \{[freq\ (Cl1) + freq\ (Cl3a)]_b - [freq\ (Cl1) + freq\ (Cl3a)]_p\} / CDF$$

$$= \{[2.07E\text{-}07 + 6.05E\text{-}07] - [8.70E\text{-}08 + 6.95E\text{-}07]\} / 9.446E\text{-}06$$

$$= 0.0032, \text{ or } 0.32\%$$

Summary

A summary of the sensitivity risk analysis of the ILRT interval changes using the previously approved methodology is presented in Table 6.

Table 6
Summary of Results of ILRT Interval Risk Evaluation

ILRT Interval	ILRT Risk Contribution	LERF	ΔLERF from baseline	ΔLERF from current
baseline (3 in 10 years)	2.21%	1.98E-07	—	—
current (1 in 10 years)	2.42%	2.18E-07	2.0E-08	—
proposed (1 in 15 years)	2.53%	2.28E-07	3.0E-08	1.0E-08

Regulatory Guide (RG) 1.174 provides guidance for determining the risk impact of plant-specific changes to the licensing basis. RG 1.174 defines very small changes in risk as resulting in increases of core damage frequency (CDF) below 1E-06/year and increases in LERF below 1E-07/year. Since the ILRT does not impact CDF, the relevant metric is LERF. Calculating the increase in LERF involves determining the impact of the ILRT interval on the leakage probability. Based on the RG 1.174 guidance, the extension of the ILRT interval from 10 years to 15 years is risk-insignificant.

For comparison purposes, the evaluation results using an alternate analysis methodology by RBS, derived using different assumptions and methodology, are presented in Table 7. This sensitivity analysis utilized a more realistic estimate of the probability of the Class 3 containment failure states and also a more realistic estimate of the impact of the extended interval.

Table 7
Summary of Results of ILRT Interval
Risk Evaluation (using RBS approach)

ILRT Interval	ILRT Risk Contribution	Class 3b Frequency	Class 3b frequency change from baseline	Class 3b frequency change from current
baseline (3 in 10 years)	3.6%	1.47E-07	—	—
current (1 in 10 years)	3.9%	1.62E-07	1.5E-08	—
proposed (1 in 15 years)	4.1%	1.69E-07	2.2E-08	7.0E-09

The table considers only the Class 3b event frequency as the quantification of the risk of the interval extension since this is the only class affected by the ILRT extension. This is consistent with the previously approved methodology. This frequency was calculated by first determining the core damage frequency for those events that were less severe than the Class 3b events. This core damage frequency was then multiplied by the Class 3b event probability. This prevents double counting core damage events. This results in a slightly smaller Class 3b frequency than that calculated in the previously approved methodology. Additionally, RBS increased the leakage rate of the Class 3b events to over 200La. This was done since most of the RBS analyzed penetration failures, which are not categorized as LERF in the RBS PSA, produce leakage rates larger than 35La. This larger assumed leakage rate increased the dose consequences of the Class 3b events, and therefore, the risk contribution of the ILRT, even though the Class 3b frequency slightly decreased. These frequencies were calculated specifically for this submittal using unique definitions (i.e., only Class 3b events were considered) and will differ from the LERF information presented in past submittals.

Although the RBS approach used a different methodology to evaluate the impact of an increased ILRT testing interval, both methodologies resulted in a change in risk of less than 1.0E-07/yr. Therefore, based on the RG 1.174 guidance, the extension of the ILRT interval from 10 years to 15 years is risk-insignificant using either methodology.

Technical Analysis and Risk Evaluation Conclusion

The risk associated with extending the ILRT interval is quantifiable. Entergy has utilized two alternate methodologies to quantify the risk and evaluate the proposed change in the ILRT interval to 15 years. The comparison developed above demonstrates that both methodologies demonstrate the risk associated with the extension of the interval is small and acceptable. On this basis, Entergy requests approval of a one-time extension of the RBS ILRT interval to 15 years.

5.0 REGULATORY ANALYSIS

5.1 Applicable Regulatory Requirements/Criteria

The proposed change has been evaluated to determine whether applicable regulations and requirements continue to be met. The requirements to perform an integrated leak rate test (ILRT) of the containment are set forth in 10CFR50.54(o) and 10CFR50 Appendix J. Both of these sections address criteria established in 10CFR50 Appendix A in General Design Criteria 50, 51, 52, and 53. A discussion of the RBS conformance with these General Design Criteria (GDC) is provided in the Safety Analysis Report (SAR) Chapter 3.1.2. Entergy has determined that the proposed change does not require any exemptions or relief from regulatory requirements and does not affect conformance with any GDC as described in the SAR. This change does involve a relaxation, on a one-time basis, to guidance in NEI 94-01, which is endorsed by Regulatory Guide 1.163.

As the proposed change is for a test interval extension, Entergy is justifying the request on a risk-informed basis in accordance with RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." The proposed change has been found to satisfy the key principles identified in RG1.174 for risk-informed changes. Those principles are:

- the change satisfies current regulations
- the change is consistent with the defense-in-depth philosophy
- the change maintains sufficient safety margins
- the increase in risk is small and is consistent with the NRC Safety Goal Policy Statement
- the impact of the proposed change will be monitored using performance measurement strategies (as a part of the current performance-based testing program).

5.2 No Significant Hazards Consideration

Entergy Operations, Inc. is proposing to revise the RBS Administrative Technical Specifications regarding containment leak rate testing. The proposed change will revise the improved RBS Administrative Technical Specification 5.5.13 to add an exception to the commitment to follow the guidelines of Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program." The exception is taken to the interval guidance in NEI 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J." The effect of this request will be a one-time extension of the interval between tests from 10 years to 15 years.

Entergy Operations, Inc. has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10CFR50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   10CFR50, Appendix J was amended to incorporate provisions for performance-based testing in 1995. The proposed amendment to Technical Specification (TS) 5.5.13 adds a one-time extension to the current interval for Type A testing (i.e., the integrated leak rate test). The current interval of ten years, based on past performance, would be extended on a one-time basis to 15-years from the date of the last test. The proposed extension to the Type A test cannot increase the probability of an accident since there are no design or operating changes involved and the test is not an accident initiator. The proposed extension of the test interval does not involve a significant increase in the consequences since research documented in NUREG-1493, "Performance Based Containment Leak Rate Test Program," has found that, generically, fewer than 3% of the potential containment leak paths are not identified by Type B and C testing. A risk evaluation of the interval extension for RBS is consistent with these results. In addition, at RBS, the testing and containment inspections also provide a high degree of assurance that the containment will not degrade in a manner detectable only by a Type A test. Inspections required by the Maintenance Rule (10CFR50.65) and by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code are performed to identify containment degradation that could affect leaktightness.

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

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed extension to the interval for the Type A test does not involve any design or operational changes that could lead to a new or different kind of accident from any accidents previously evaluated. The test itself is not being modified, but is only intended to be performed after a longer interval. The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation.

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

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The generic study of the increase in the Type A test interval, NUREG-1493, concluded there is an imperceptible increase in the plant risk associated with extending the test interval out to twenty years. Further, the extended test interval would have a minimal effect on this risk since Type B and C testing detect 97% of potential leakage paths. For the requested change in the RBS ILRT interval, it was determined that the risk contribution of leakage will increase 0.32%. This change is considered very small and does not represent a significant reduction in the margin of safety.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed amendment presents no significant hazards considerations under the standards set forth in 10CFR50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.3 Environmental Considerations

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10CFR51.22(c)(9). Therefore, pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 PRECEDENCE

Similar amendment requests have been approved for:

Facility	Amendment #(s)	Approval Date	Accession #
Indian Point 3	206	April 17, 2001	ML011020315
Crystal River 3	197	August 30, 2001	ML012190219
Peach Bottom 3	244	October 4, 2001	ML012210108
Waterford 3	178	February 14, 2002	ML020500390

In addition, similar requests from ANO-1 and Indian Point 2 (both Entergy facilities) are currently under review by the NRC.

Attachment 2

RBG-45952

Proposed Technical Specification Changes (mark-up)

5.5 Programs and Manuals

5.5.11 Technical Specifications (TS) Bases Control Program (continued)

c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the USAR.

d. Proposed changes that do not meet the criteria of either Specification 5.5.11.b.1 or Specification 5.5.11.b.2 above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

5.5.12 DELETED

5.5.13 Primary Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 7.6 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.26% of primary containment air weight per day.

The Primary Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq 0.60\ L_a$ for the Type B and Type C tests and $\leq 0.75\ L_a$ for Type A tests.

The provisions of SR 3.0.2 do not apply to test frequencies specified in the Primary Containment Leakage Rate Testing Program.

The provisions of SR 3.0.3 are applicable to the Primary Containment Leakage Rate Testing Program.

except that the next Type A test performed after the August 15, 1992 Type A test shall be performed no later than August 14, 2007.