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GNRO-2003/00029

May 12, 2003

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

SUBJECT: Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License Amendment Request
One-time Extension of the Integrated Leak Rate Test and Drywell Bypass Test Interval

REFERENCE: One-time Extension of the Integrated Leak Rate Test Interval for River Bend Station, License Amendment Request, LAR 2002-16

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Operations, Inc. (Entergy) hereby requests an amendment for Grand Gulf Nuclear Station, Unit 1 (GGNS) to change administrative Technical Specification (TS) 5.5.12 regarding Containment Integrated Leak Rate Testing (ILRT) and TS 3.6.5.1.1 regarding drywell bypass leakage. The change would allow for an extended interval (15 years) for performance of the next ILRT and drywell bypass leakage test. 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 (RG) 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 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c) and it has been determined that this change involves no significant hazards considerations. The bases for these determinations are included in the attached submittal.

The proposed change does not include any new commitments. The NRC has approved similar Technical Specification changes for the Integrated Leak Rate Test for River Bend Station, Unit 1 and many others. The Technical Specification Bases Mark-ups in Attachment 3 are provided for information only.

GGNS has identified this change as affecting activities planned during the upcoming refueling outage and on that basis requests approval of this proposed change by January 30, 2004. The requested approval date and implementation period will enable GGNS to optimize refueling outage planning and activities. This request will save critical path time in the refueling outage and permit the deferral of the ILRT and drywell bypass test until a subsequent outage. Once

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approved, the amendment shall be implemented within 60 days. Although this request is neither exigent nor emergency, your prompt review is requested.

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 May 12, 2003.

Sincerely,

JCR/WBB/amt

Attachments:
1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)
3. Changes to TS Bases Pages (for Information)

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Attachment 1

GNRO/2003-00029

Analysis of Proposed Technical Specification Change

1.0 DESCRIPTION

This letter is a request to amend Operating License NPF-29 for Grand Gulf Nuclear Station, Unit 1 (GGNS).

The proposed changes will revise the Operating License to change the Administrative Technical Specification (TS) regarding Containment Integrated Leak Rate Testing (ILRT) and the TS regarding Drywell Bypass Leakage Testing (DWBT). The change would allow for an extended interval (15 years) for performance of the next ILRT and the DWBT. In accordance with recent practice for similar submittals, this request is made for a one-time extension of the interval.

2.0 PROPOSED CHANGE

The proposed changes will revise the Operating License to change Administrative Technical Specification (TS) 5.5.12 regarding Containment Integrated Leak Rate Testing (ILRT) and TS 3.6.5.1.1 regarding DWBT. The change would add an exception to the commitment to implement in accordance with the Safety Evaluation issued by the Office of Nuclear Reactor Regulation dated April 26, 1995 (GNRI-95/00087) as modified by the Safety Evaluation issued for Amendment No. 135 to the Operating License. The change would allow for an extended interval (15 years) for performance of the next ILRT and the DWBT.

GGNS proposes to revise TS 5.5.12 of the improved Technical Specifications by revising the second sentence from:

> This program shall be implemented in accordance with the Safety Evaluation issued by the Office of Nuclear Reactor Regulation dated April 26, 1995 (GNRI-95/00087) as modified by the Safety Evaluation issued for Amendment No. 135 to the Operating License.
>
> to:
>
> This program shall be implemented in accordance with the Safety Evaluation issued by the Office of Nuclear Reactor Regulation dated April 26, 1995 (GNRI-95/00087) as modified by the Safety Evaluation issued for Amendment No. 135 to the Operating License, except that the next Type A test performed after the November 24, 1993 Type A test shall be performed no later than November 23, 2008.

GGNS also proposes to revise TS 3.6.5.1.1 of the improved Technical Specifications by adding an exception to the Frequency requirement of 120 months that states:

> except that the next drywell bypass leak rate test performed after the November 24, 1993 test shall be performed no later than November 23, 2008

In summary, the proposed change would represent a one-time deferral of the ILRT and the DWBT by up to five additional years. A marked-up modification to a Technical Specification Bases associated with this change is included in Attachment 3.

3.0 BACKGROUND

GGNS is a General Electric Boiling Water Reactor (BWR) design plant. It is a BWR-6 with a Mark III containment. The drywell is enclosed within the primary containment and is designed to divert the energy released during a design basis large break loss of cooling accident (LOCA). The drywell communicates with the primary containment through a series of horizontal vents in the drywell wall. The vents are covered both inside and outside the drywell by water from the annular shaped suppression pool. The pool forms a seal between the drywell and the primary containment. During a LOCA, blowdown from the reactor coolant system will uncover these vents allowing flow to the primary containment through the suppression pool water. The suppression pool serves as a heat sink for the energy released during a large break LOCA. The drywell contains the reactor coolant system and other high energy piping systems. This design also allows much of the high energy auxiliary systems to be located inside the primary containment. This is discussed further in Section 6.2 of the GGNS Updated Final Safety Analysis Report (UFSAR).

Several tests are done to ensure the integrity of the containment/drywell function, including both the ILRT and the DWBT. Testing frequencies for the ILRT are performance-based as allowed by 10 CFR 50, Appendix J, Option B. Option B requires that Regulatory Guide (RG) 1.163 or another implementation document used by a licensee to develop a performance-based leakage rate testing program be incorporated by general reference in the plant TS. As part of the original development of Option B, GGNS established a performance-based Appendix J, Testing Program. GGNS submitted a request for an exemption to the requirements of 10 CFR 50, Appendix J, that included TS changes to assist the NRC staff in the initial development of the Option B rulemaking. The NRC approved the exemption. GGNS later proposed to add the program to the TS as the implementing document rather than Regulatory Guide 1.163. Therefore, the guidance of the associated Safety Evaluation Reports (SER) for the exemption is included in the TS rather than the implementing guidance of RG 1.163. Currently, the maximum testing interval for the ILRT is 10 years. DWBT is also on a performance-based interval with a current maximum testing frequency of 120 months as required by TS.

ILRTs and DWBT for BWR6/Mark III plants 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 or DWBTs from exceeding their required acceptance criteria. The NRC has allowed the extension of test frequency from three times in ten years to once in ten years based on performance. The changes were based for the most part on NUREG 1493, "Performance Based Containment Leak-Test Program," dated September, 1995. The NUREG stated that an interval between ILRTs of up to twenty years would contribute an imperceptible increase in risk.

GGNS has performed several ILRTs and DWBTs during the period of its Operating License. The two most recent ILRTs were performed in November 1993 and April 1989. The two most recent DWBTs were performed in November 1993 and June of 1989. These tests were successful and on this basis, GGNS currently has a ten-year interval in which to perform the next ILRT and DWBT. Without this change, GGNS, utilizing provisions allowing an interval extension of up to 15 months, would plan to perform the next tests during the upcoming outage in April, 2004.

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), Subsection IWE.

Entergy is 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 tests and should permit consideration of any agreements reached on the generic change.

4.0 TECHNICAL ANALYSIS -- ILRT

The proposed change to extend the ILRT and DWBT on a one time basis to 15 years is justified based on a combination of risk-informed analyses (Subsections 4, 5 and 6) a history of successful tests (Subsection 7), monitoring of drywell leakage (Subsection 8), and the ASME required containment inspection program (subsection 9). Each of these is discussed below.

Risk Analyses

NUREG 1493 is an NRC report done to determine the risk associated with containment leakage. The report concluded that containment leakage is a relatively minor contributor to reactor accident risk. This study included GGNS. The study determined that increasing the containment leakage rate from the nominal 0.5 percent per day to 5 percent per day led to less than 1 percent increase in total population exposure and that increasing the leakage rate to 509 percent per day would increase the total population exposure by about 3 percent. The study also determined that containment leakage at an assumed 0.5 percent per day was found to contribute only about 0.02 percent to the total expected population dose from potential accidents at GGNS. The study also determined that the risk results were well below the safety goal (based on the NRC policy statement on "Safety Goals for the Operation of Nuclear Power Plants" dated August 4, 1986) for the entire range of leakage rates considered. The study also noted that reducing the frequency of ILRTs from the then current 3 per 10 years to one per 20 years resulted in an imperceptible increase in risk. This was based on the small number of leakage paths that were identifiable only by the ILRT and the insensitivity of risk to containment leakage rates. The analyses done in support of this request have been done to support the conclusions of the NRC report.

In summary, risk analyses performed using the previously approved methodology demonstrates:

1. The risk of extending the ILRT and DWBT intervals for Type A tests from its current interval of 10 years to 15 years was evaluated for potential public exposure impact (as measured in man-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 (man-rem/year within 50 miles) was found to be 0.33 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 0.99 percent. This is somewhat 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. This is because of the inclusion of a conservative treatment of the drywell bypass test which was not included in the NUREG. The NUREG concluded that the changes represent 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 neither the ILRT nor the DWBT impacts CDF, the relevant criterion in evaluating this proposed change is LERF. The increase in LERF resulting from a change in the ILRT and the DWBT frequencies from the current one test in 10 years to one test in 15 years is estimated to be 1.22E-08. The cumulative increase in LERF resulting from a change in the ILRT and the DWBT intervals from the original three tests in 10 years to one test in 15 years is estimated to be 3.67E-08. Increasing the ILRT and DWBT test intervals 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 0.29 percent. The cumulative change of going from a test frequency of three tests in 10 years to one test in 15 years is 0.86 percent. 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.

These analyses are based on the latest update of the GGNS Probabilistic Risk Assessment (PRA) baseline Level 1 model. The Individual Plant Examination (IPE) level 2 results were used to characterize containment performance. There were two analyses done for both the ILRT and the DWBT. The first method used in each case is a method that the NRC has found acceptable in previous, similar submittals for ILRT extensions. The second method (alternate methodology) is based on interim guidance provided by the Nuclear Energy Institute (NEI) to provide for more consistent submittals to the NRC regarding one-time ILRT extensions. This guidance provides for a more realistic treatment of the increase in probability of leakage, a more correct treatment and additional data for determining the probability of leaks detectable by ILRT, and inclusion of provisions for utilizing NUREG-1150 dose calculations. The guidance was developed by the Electric Power Research Institute (EPRI) to enhance the earlier methodology of EPRI research project report TR-104285 (EPRI report). The alternate method results in slightly higher risk metric results than the previously approved method but still provide acceptable results.

4.1 ILRT -- Method 1

4.1.1 Methodology

The following steps will be used to analyze the risk impact of extending the ILRT test interval.

1. Classify IPE Level 2 results from the GGNS IPE into the containment failure classes identified in the EPRI report.
2. Calculate the frequency for the containment failure classes affected by the new ILRT surveillance frequency (Classes 3a and Class 3b).
3. Calculate the man-rem/yr values for all of the endstates.
4. Calculate the increase in undetected leakage frequencies attributable to the extension in ILRT surveillance frequency.
5. Using the new frequencies calculate the change in man-rem/yr, LERF and Conditional Containment Failure Probability (CCFP)

4.1.2 Containment Failure Classes

The EPRI report identifies eight classes of containment failure. Per the methodology, class 3 is divided into two parts for this analysis. The classes along with a summary description are listed in Table 4.1-1.

The quantification of the GGNS IPE Level 2 did not develop explicit containment end state frequencies. The containment event tree and the source term algorithm were quantified together with results reported in terms of ten source term release categories. These release categories have been assigned to the containment failure class which is most representative of the release category. Table 4.1-2 provides a listing of the GGNS IPE categories, the assigned containment failure class, conditional probability of the release category and rationale for choice of class. The categorization is conservative for this analysis for the following reasons:

- Release Category 6, which is binned into EPRI Class 1, includes some cases where the containment is vented. Containment venting scenarios would not be impacted by ILRT testing. Therefore, all of this category's contribution is included in Class 1 for this analysis.
- Several Release Categories include sequences where the reactor vessel is vented through the MSIVs. These categories are classified as containment failure due to phenomena rather than containment bypass since there is insufficient information to identify the specific fraction of MSIV venting versus containment failure for these release categories.

Note also that EPRI Classes 2, 4, 5, and 6 were either screened out or not specifically evaluated in the GGNS IPE. Containment bypass (Class 8, Interfacing System LOCA, but not MSIV venting) was evaluated, but was a very small fraction of CDF and is not addressed separately in this evaluation.

TABLE 4.1-1 CONTAINMENT FAILURE CLASSES FROM EPRI TR-104285

CLASS NUMBER	DESCRIPTION
1	Containment intact: accident sequences do not lead to failure; not affected by change to ILRT leak testing frequencies.
2	Failure of isolation system to operate from common cause or power failure; not affected by ILRT testing frequency.
3a	Small pre-existing leak in containment structure or liner; identifiable by ILRT; affected by ILRT testing frequency.
3b	Large pre-existing leak in containment structure or liner; identifiable by ILRT; affected by ILRT testing frequency.
4	Type B tested components fail to seal; not affected by ILRT testing frequency.
5	Type C tested components fail to seal; not affected by ILRT leak testing frequencies.
6	Failure to isolate due to valves failing to stroke closed; not affected by ILRT
7	Failure induced by severe accident phenomena; not affected by ILRT testing frequency.
8	Containment Bypass; not affected by ILRT testing frequency (ISLOCA, MSIV leakage)

Table 4.1-2 Binning of GGNS IPE Release Categories to EPRI Classes

IPE RELEASE CATEGORY	DESCRIPTION	CONDITIONAL PROBABILITY OF CLASS[1]	EPRI CLASS	COMMENTS
1 - Early Low Release	SBO with loss of all coolant make-up, Offsite power recovered prior to VB and coolant make-up restored, Core debris is quenched and CCI is prevented. Containment flooding procedure leads to re-opening of MSIVs, thus early release.	8.42E-02	7	Intentional opening of MSIVs is conservatively characterized as containment failure due to phenomena. This release category is not affected by ILRT frequency.
2 – Early Medium-Low Release	Short-term SBO similar to 1. An SRV tailpipe vacuum breaker fails to re-close and a hydrogen deflagration occurs in containment on restoration of OSP. Drywell integrity impaired due to deflagration and partial SP bypass occurs. CS operates and survives the containment failure.	1.96E-03	7	Failure due to phenomena.
3 - Early Medium Release	Short-term SBO similar to 1. An SRV tailpipe vacuum breaker fails to re-close and early releases go primarily to the drywell. Significant releases occur when MSIVs are opened as part of containment flooding procedure. CS moot since there are no significant releases to the containment.	1.33E-03	7	See comments on Release Category 1.
4 - Early Medium-High Release	Short term SBO with injection recovered early (similar to 1). Core debris can not be cooled on drywell floor following VF. CCI release occurs. With RPV vented through the MSIV, containment is largely bypassed and retention of CCI release is poor.	3.43E-01	7	See comments on Release Category 1.
5 - Early High Release	Similar to 4, recovery of injection does not prevent VF and core debris is not cooled. Early releases not scrubbed due to failure of an SRV tailpipe vacuum breaker to re-close. With RPV vented through the MSIVs, containment is bypassed and the retention of releases is poor.	3.27E-02	7	See comments on Release Category 1.

IPE RELEASE CATEGORY	DESCRIPTION	CONDITIONAL PROBABILITY OF CLASS[1]	EPRI CLASS	COMMENTS
6 - Late Low Release	Accident involves a medium sized primary system leakage combined with failure of coolant makeup. Fire water system is aligned and VB is averted. Igniters operate and maintain containment pressure within acceptable limits. SP cooling and containment sprays are failed and containment is eventually vented to provide long term decay heat removal. Accident progression involving no containment failure also contributes significantly to this release category.	3.14E-01	1	This release category includes some long term containment venting contribution but, most of the contribution (at least 64% of the total) is from no containment failure sequences. It is acceptable to apply all the contribution to Class 1 for this application since the need for venting would not be impacted by the ILRT
7 - Late Medium-Low Release	Similar to 2 except containment fails late due to the failure to recover SPC.	2.21E-04	7	Failure due to phenomena.
8 - Late Medium Release	SBO with no power recovery. (Long-term SBO, RCIC operates until battery depletion. Hydrogen produced during core damage never ignites in containment or burns benignly. Containment failure occurs after 30 or more hours due to slow pressure build-up form CCI. All releases scrubbed through the pool.	7.17E-02	7	Failure due to phenomena.
9 - Late Medium-High Release	SP is bypassed during the late phased of accident. Short-term SBO, no OSP recovery. VF and CCI occur. Hydrogen combustion in containment (from random ignition sources) causes water from SP to be force to drywell. CCI is then submerged but upper horizontal vent is not submerged to ensure pool scrubbing. Re-volatilization releases from vessel pass through the drywell into containment with little scrubbing. Containment fails due to over-pressurization.	3.11E-03	7	Failure due to phenomena.
10 - Late High Release	Transient initiating events followed by failure of all injection. Igniters ensure that hydrogen combustion is controlled and early containment failure is precluded. Late SP bypass occurs due to thermal degradation of drywell (temperature extremes) or drywell vacuum breaker failure. Containment failure is due to long-term pressurization.	1.48E-01	7	Failure due to phenomena.

Note: The conditional probability of each class (given core damage) is obtained from the IPE base case results.

4.1.3 Frequency Calculations

The frequency for EPRI Class 7 is determined by multiplying the sum of the conditional probabilities listed in Table 4.1-2 for Class 7 times the CDF frequency of the GGNS PRA Level 1 results (4.27E-6/yr).

Class 7 freq. = 0.686 X 4.27E-6/yr = 2.93E-6/yr

As indicated before, Classes, 2, 4, 5, 6, and 8 are not affected by the ILRT and were either screened out or not specifically evaluated in the GGNS IPE. Therefore, it is acceptable not to specifically address these classes in this calculation.

As suggested in the previously approved methodology, Class 3 has been separated into 2 subclasses. Class 3a represents small leakage identified only by ILRTs, while class 3b represents the large releases identified only by ILRTs. These frequencies represent the core damage scenarios which are associated with an undetected containment leak that an ILRT alone would have detected. Class 3a represents a small leak, while Class 3b represents a leak large enough to be considered in a LERF calculation. In order to calculate this frequency, the probability that a leak which would only be detected by the ILRT must first be determined. This probability is determined using information in NUREG-1493. No large leaks and only four small leaks (in excess of L_a) out of 144 ILRTs were reported in NUREG-1493. Conservative estimates using the 95^{th} percentile of the X^2 distribution results in a 3a probability estimate of 0.064 and a 3b probability estimate of 0.021.

The frequency of the core damage scenarios for Class 3a and 3b is found by multiplying their probability times the total Core Damage Frequency (CDF) from the GGNS PRA level 1 results.

3a = 0.064 X 4.27E-6/yr = 2.73E-7/yr
3b = 0.021 X 4.27E-6/yr = 8.97E-8/yr

The next step is to calculate the Class 1 frequency. Based on the EPRI report, the ILRT interval should have no effect on the total CDF. Therefore, in order to maintain a constant CDF value, the Class 1 frequency will be updated to remove the new Class 3 scenarios.

Class 1 freq. = No Containment Failure (NCF) freq. – Class 3a freq. – Class 3b freq.

NCF freq. = Total CDF – Class 7 freq. = 4.27E-6/yr – 2.93E-6/yr = 1.34E-6/yr

Class 1 freq. = 1.34E-6/yr – 2.73E-7/y – 8.97E-8/yr = 9.77E-7/yr

A summary of the class frequencies is provided in Table 4.1-3.

TABLE 4.1-3 BASELINE CLASS FREQUENCIES

Class Number	Description	Base Frequency	Percentage of Total
1	No Containment Failure	9.77E-07	22.89%
2	Failure of isolation system – Not analyzed	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	2.73E-07	6.40%
3b	Large pre-existing leak in containment structure or liner	8.97E-08	2.10%
4	Type B – Not analyzed	N/A	N/A
5	Type C – Not analyzed	N/A	N/A
6	Other isolation failures – Not analyzed	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)	2.93E-06	68.61%
8	Containment Bypass – Not analyzed	N/A	N/A
	Total Frequency	4.27E-06	

4.1.4 Baseline Man-Rem/Yr Values

The GGNS IPE did not develop consequences in the form of man-rem estimates for the IPE Level 2. Therefore, an estimate will be developed based on the design basis LOCA Dose Analysis. From Table 15.6-14 of the GGNS UFSAR, the Low Population Zone dose is 4.60 man-rem. This dose is based on the maximum allowable GGNS primary containment leakage rate, L_a. This dose is based on a 2 mile (3219 meter) radius; therefore, a calculation must be made to determine a value for a 50 mile radius. Conservative dose estimates for various radial intervals can be determined by ratioing the LPZ dose, since the distance away from the source is in the denominator of the X/Q value. In order to obtain the total population dose, the population of the different distance intervals must also be included. These values are obtained from Table 2.1-3 of the GGNS UFSAR. Population estimates for the Year 2020 are used for conservatism. Table 4.1-4 provides a summary of this calculation.

Table 4.1-4 Baseline Man-Rem				
Used for Ratio	**Mileage interval**	**Average Dose (Rem) for Interval**	**Population**	**Man-Rem**
5	0-10	9.20E-01	8,781	8.08E+03
15	10-20	3.07E-01	21,074	6.46E+03
25	20-30	1.84E-01	93,380	1.72E+04
35	30-40	1.31E-01	136,104	1.79E+04
45	40-50	1.02E-01	122,705	1.25E+04
			Total Man-REM for 50 mile Radius	6.22E+04

Per the previously approved methodology, the Class 3a and 3b population dose is 10 times and 35 times the Baseline (L_a) population dose.

Class 3a man-rem = 10 X 6.22E4 = 6.22E5
Class 3b man-rem = 35 X 6.22E4 = 2.18E6

The Class 7 dose will be estimated as 100 times the Baseline (L_a) population dose. Evaluations performed in support of the Crystal River 3 application (Accession #ML012190219) have shown that this is a reasonable approximation. Also, other ILRT submittals (e.g., Waterford 3 Accession #ML020500390) have also made this same assumption.

Class 7 man-rem = 100 X 6.22E4 = 6.22E6

When these class man-rem values are multiplied by their respective frequencies, risk estimates in terms of man-rem/year values are obtained for each class. Table 4.1-5 provides a summary of the baseline risk values.

Table 4.1-5 Baseline Class Risk

Class	Frequency (per reactor-year)	Release (man-rem)	Base Risk Man-rem/year
1	9.77E-07	6.22E4	6.08E-02
2	N/A	N/A	N/A
3a	2.73E-07	6.22E5	1.70E-01
3b	8.97E-08	2.18E6	1.95E-01
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	2.93E-06	6.22E6	1.82E+01
8	N/A	N/A	N/A
		Total Risk	1.86E+01

4.1.5 Increase in ILRT Frequencies

The increases in the Class 3a and 3b frequencies are taken directly from the previously approved methodology. The original approved test interval for the ILRT test was 3 in 10 years. This interval is the basis for the NUREG-1493 data. The current test interval at GGNS is 1 in 10 years. The recommended increase in frequency for this time increase is 10% based on calculations performed in support of the Crystal River application. This value is derived by ratioing the time between tests and then multiplying by the 3% (4/144) of overall leakage that is detected by the ILRT alone.

120 months / 40 months * 0.03 = 0.09 or ~ 10%

The same approach is applied to the change to 1 in 15 years.

180 months/40 months * 0.03 = 0.135 or ~15%

Note: The use of 3% appears to be non-conservative here since the baseline frequency already takes into account that only 4 of 144 tests were found by ILRT. This non-conservatism is removed in the alternate methodology.

The changes in Class 3a and 3b frequencies, as well as the adjustments to the Class 1 frequencies when these increases are taken into account are included in Table 4.1-6 below.

Table 4.1-6 Class Frequencies for Different ILRT Test Frequencies

Class	Description	Base	1 in 10	1 in 15
1	No Containment Failure	9.77E-07	9.41E-07	9.23E-07
2	Failure of isolation system – Not analyzed	N/A	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	2.73E-07	3.01E-07	3.14E-07
3b	Large pre-existing leak in containment structure or liner	8.97E-08	9.86E-08	1.03E-07
4	Type B – Not analyzed	N/A	N/A	N/A
5	Type C – Not analyzed	N/A	N/A	N/A
6	Other isolation failures – Not analyzed	N/A	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)	2.93E-06	2.93E-06	2.93E-06
8	Containment Bypass – Not analyzed	N/A	N/A	N/A
	Total Frequency	4.27E-06	4.27E-06	4.27E-06

4.1.6 Change in Man-rem/yr, LERF and CCFP

The impact of extended ILRT frequencies on risk can be determined using the information in Tables 4.1-5 and 4.1-6. The risk results for the different test frequencies are included in Table 4.1-7.

Table 4.1-7 Risk for Different ILRT Frequencies

		Risk, man-rem/yr		
Class	**Description**	**Base**	**1 in 10**	**1 in 15**
1	No Containment Failure (L_a)	6.08E-02	5.85E-02	5.74E-02
2	Failure of isolation system – Not analyzed	N/A	N/A	N/A
3a	Small pre-existing leak in containment structure or liner (10 X L_a)	1.70E-01	1.87E-01	1.95E-01
3b	Large pre-existing leak in containment structure or liner (35 X L_a)	1.95E-01	2.15E-01	2.24E-01
4	Type B – Not analyzed	N/A	N/A	N/A
5	Type C – Not analyzed	N/A	N/A	N/A
6	Other isolation failures – Not analyzed	N/A	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting) (100 X L_a)	1.82E+01	1.82E+01	1.82E+01
8	Containment Bypass – Not analyzed	N/A	N/A	N/A
	Total Man-Rem/Yr:	1.863E+01	1.867E+01	1.869E+01
	Change from Baseline Man-Rem/yr		3.42E-02	5.14E-02
	ILRT Contribution	1.96%	2.15%	2.25%
	% increase from Base:		0.18%	0.28%
	Change from 1 in 10 to 1 in 15:			1.71E-02
	% Change from 1 in 10 to 1 in 15:			0.09%

The change in LERF for extending the ILRT test frequency is the increase due to the change in the large pre-existing leak class, Class 3b. The Class 3a leak size is too small to be considered a LERF. This increase is documented below.

Change in LERF is represented by the change in 3b frequency

	Base	1 in 10	1 in 15
3b Frequency	8.97E-08	9.86E-08	1.03E-07
Delta LERF from Base		8.97E-09	1.35E-08
Delta LERF from 1 in10 to 1 in 15			4.48E-09

The change in CCFP is considered to be the change in containment failure probability given an accident. This can be calculated as follows:

CCFP = 1 – (Frequency of NCF)/Total CDF
NCF = Non Containment Failure Classes
Frequency of NCF = Class 1 frequency + Class 3a frequency
Delta CCFP = $CCFP_{Proposed}$ – $CCFP_{Current}$

The calculations for each ILRT option are summarized below.

	Class1 Freq	Class 3a Freq	Sum (Freq of NCF)	CDF	CCFP	Delta from base	Delta from Current
Baseline	9.77E-07	2.73E-07	1.25E-06	4.27E-06	7.07E-01		
1 in 10	9.41E-07	3.01E-07	1.24E-06	4.27E-06	7.09E-01	0.21%	
1 in 15	9.23E-07	3.14E-07	1.24E-06	4.27E-06	7.10E-01	0.31%	0.11%

4.1.7 Summary of Previously Approved Methodology Results

Table 4.1-8 provides a summary of the results for the extension of the ILRT frequency from 1 in 10 years to 1 in 15 years.

Table 4.1-8 Summary of Results (Previously Approved Methodology)

	3 in 10yr	1 in 10yr	1 in 15yr
Total Risk	1.863E+01	1.867E+01	1.869E+01
ILRT Risk Contribution (%)	1.96%	2.15%	2.25%
Increase from Base		0.18%	0.28%
Increase from Current			0.09%
LERF value due to ILRT	8.97E-08	9.86E-08	1.03E-07
Increase from Base		8.97E-09	1.35E-08
Increase from Current			4.48E-09
CCFP	7.07E-01	7.09E-01	7.10E-01
Increase from Base		0.21%	0.31%
Increase from Current			0.11%

Based on the above results, the extension of the ILRT test interval from the current interval of once in 10 years to once in 15 years does not pose a significant increase in risk to the public.

The LERF value is within the Region 3 of Regulatory Guide 1.174 (very small) guidance and is considered acceptable.

4.2 Alternate Methodology

EPRI developed the alternate methodology in order to provide interim guidance to licensees for developing uniform risk impact assessments supporting one-time extensions of ILRT surveillance intervals. This guidance improves on previous methods in three areas. These areas include:

- a more realistic treatment of the increase in probability of leakage
- a more correct treatment and additional data for determining the probability of leaks detectable by ILRT
- the inclusion of provisions for utilizing NUREG-1150 dose calculations

4.2.1 Methodology

The alternate methodology incorporates the following steps.

1. Quantify the baseline (nominal three year ILRT interval) risk in terms of frequency per reactor year for the EPRI accident classes of interest.
2. Determine the containment leakage rates for applicable cases, 3a and 3b.
3. Develop the baseline population dose (man-rem) for the applicable accident classes.
4. Determine the population dose rate (man-rem/year) by multiplying the dose calculated in step 3 by the associated frequency calculated in step 1.
5. Determine the change in probability of leakage detectable only by ILRT, and associated frequency for the new surveillance intervals of interest. Note that with increases in the ILRT surveillance interval, the size of the postulated leak path and the associated leakage rate are assumed not to change, however the probability of leakage detectable only by IRLT does increase.
6. Determine the population dose rate for the new surveillance intervals of interest.
7. Evaluate the risk impact (in terms of population dose rate and percentile change in population dose rate) for the interval extension cases.
8. Evaluate the risk impact in terms of LERF.
9. Evaluate the change in conditional containment failure probability.

Several of these steps are similar to steps used in the previously approved methodology and output of those steps will be used here.

4.2.2 Baseline Frequency (Step 1)

The accident class categorization and from Section 4.1.2 is applicable to and will be used for the alternate methodology also. The baseline frequencies however, must be recalculated using different probabilities for leakage. The EPRI interim guidance recommends a probability of

0.027 for Class 3a and a probability of 0.0027 for Class 3b. Using these values, the frequency of accident Classes 3a and 3b are calculated as follows.

Class 3a = 0.027 X 4.27E-6/yr = 1.15E-7/yr
Class 3b = 0.0027 X 4.27E-6/yr = 1.15E-8/yr

The next step is to calculate the Class 1 frequency. Based on the EPRI report, the ILRT interval should have no effect on the total CDF. Therefore, in order to maintain a constant CDF value, the Class 1 frequency will be updated to remove the new Class 3 scenarios.

Class 1 freq. = No Containment Failure (NCF) freq. – Class 3a freq. – Class 3b freq.

NCF freq. = Total CDF – Class 7 freq. = 4.27E-6/yr – 2.93E-6/yr = 1.34E-6/yr

Class 1 freq. = 1.34E-6/yr – 1.15E-7/y – 1.15E-8/yr = 1.21E-6/yr

A summary of the class frequencies is provided in Table 4.2-1.

TABLE 4.2-1 BASELINE CLASS FREQUENCIES (ALTERNATE METHODOLOGY)

CLASS NUMBER	DESCRIPTION	BASE FREQUENCY	PERCENTAGE OF TOTAL
1	No Containment Failure	1.21E-06	28.42%
2	Failure of isolation system – Not analyzed	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	1.15E-07	2.70%
3b	Large pre-existing leak in containment structure or liner	1.15E-08	0.27%
4	Type B – Not analyzed	N/A	N/A
5	Type C – Not analyzed	N/A	N/A
6	Other isolation failures – Not analyzed	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)	2.93E-06	68.61%
8	Containment Bypass – Not analyzed	N/A	N/A
	Total Frequency	4.27E-06	

4.2.3 Baseline Accident Dose for Accident Classes (Steps 2 and 3)

As indicated in Section 4.1.4, the GGNS IPE did not develop consequences in the form of man-rem estimates for the IPE Level 2. It also did not develop explicit containment end state frequencies. For the previous reasons it is not possible to correlate GGNS level 2 results to the consequence analysis of NUREG/CR-4551. Therefore, the baseline dose evaluation that was developed in Section 4.1.4 with will also be used for the alternate methodology.

4.2.4 Baseline Accident Class Dose Rates (Step 4)

The baseline accident dose rates (risk) are determined by multiplying the associated dose (release) by the frequency of the alternate methodology classes. The man-rem/year values are listed in Table 4.2-2.

Table 4.2-2 Baseline Class Risk (Alternate Methodology)

Class	Frequency (per reactor-year)	Release (man-rem)	Base Risk Man-rem/year
1	1.21E-06	6.22E4	7.54E-02
2	N/A	N/A	N/A
3a	1.15E-07	6.22E5	7.17E-02
3b	1.15E-08	2.18E6	2.51E-02
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	2.93E-06	6.22E6	1.82E+01
8	N/A	N/A	N/A
Total Risk			1.838E+01

4.2.5 Change in Probability of Leakage Detectable by ILRT (Step 5)

NUREG 1493 states that relaxing the ILRT frequency from 3 in 10 years to 1 in 10 years will increase the average time that a leak that is detectable only by ILRTs goes undetected from 18 to 60 months (1/2 the surveillance interval), a factor of 60/18 = 3.33 increase. The overall probability of leakage can then be expressed as 3 *(surveillance interval of interest, in months/2)/18, in percent. To determine the frequency for the new surveillance interval of interest, multiply the baseline (3 tests/ 10 year interval) frequency by a factor = (interval in months/2)/18. The factors are calculated below.

1 in 10 year factor = (120 months/2)/18 = 3.333

1 in 15 year factor = (180 months/2)/18 = 5

These factors are applied to the baseline frequencies in Table 4.2-3.

Table 4.2-3 Class Frequencies for Different ILRT Test Frequencies (Alternate Methodology)

Class	Description	Base	1 in 10	1 in 15
1	No Containment Failure	1.21E-06	9.18E-07	7.06E-07
2	Failure of isolation system – Not analyzed	N/A	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	1.15E-07	3.84E-07	5.76E-07
3b	Large pre-existing leak in containment structure or liner	1.15E-08	3.84E-08	5.76E-08
4	Type B – Not analyzed	N/A	N/A	N/A
5	Type C – Not analyzed	N/A	N/A	N/A
6	Other isolation failures – Not analyzed	N/A	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)	2.93E-06	2.93E-06	2.93E-06
8	Containment Bypass – Not analyzed	N/A	N/A	N/A
	Total Frequency	4.27E-06	4.27E-06	4.27E-06

4.2.6 Determine Population Dose Rate (Steps 6 and 7)

The impact of extended ILRT test frequencies on risk can be determined using the information in Tables 4.2-2 and 4.2-3. The risk results are listed in Table 4.2-4. The change in dose rate and the percentage increase due the extended test frequencies are also included in this table.

Table 4.2-4 Risk for Different ILRT Test Frequencies (Alternate Methodology)

		Risk, man-rem/yr		
Class	**Description**	**Base**	**1 in 10**	**1 in 15**
1	No Containment Failure (L_a)	7.54E-02	5.70E-02	4.39E-02
2	Failure of isolation system – Not analyzed	N/A	N/A	N/A
3a	Small pre-existing leak in containment structure or liner (10 X L_a)	7.17E-02	2.39E-01	3.58E-01
3b	Large pre-existing leak in containment structure or liner (35 X L_a)	2.51E-02	8.36E-02	1.25E-01
4	Type B – Not analyzed	N/A	N/A	N/A
5	Type C – Not analyzed	N/A	N/A	N/A
6	Other isolation failures – Not analyzed	N/A	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting) (100 X L_a)	1.82E+01	1.82E+01	1.82E+01
8	Containment Bypass – Not analyzed	N/A	N/A	N/A
	Total Man-Rem/Yr:	1.838E+01	1.859E+01	1.874E+01
	Change from Baseline Man-Rem/yr		2.07E-01	3.55E-01
	ILRT Contribution:	0.53%	1.73%	2.58%
	% increase from Base:		1.13%	1.93%

		Risk, man-rem/yr		
Class	**Description**	**Base**	**1 in 10**	**1 in 15**
	Change from 1 in 10 to 1 in 15:			1.48E-01
	% Change from 1 in 10 to 1 in 15:			0.80%

4.2.7 Change in LERF and CCFP (Step 8 and 9)

The change in LERF for extending the ILRT test frequency the increase due to the change in the large pre-existing leak class, Class 3b. The Class 3a leak size is too small to be considered a LERF. This increase is documented below.

Change in LERF is represented by the change in 3b frequency

	Base	1 in 10	1 in 15
3b Frequency	1.15E-08	3.84E-08	5.76E-08
Delta LERF from Base		2.69E-08	4.61E-08
Delta LERF from 1 in10 to 1 in 15			1.92E-08

The change in CCFP is considered to be the change in containment failure probability given an accident. This can be calculated as follows:

CCFP = 1 – (Frequency of NCF)/Total CDF
NCF = Non Containment Failure Classes
Frequency of NCF = Class 1 frequency + Class 3a frequency
Delta CCFP = $CCFP_{Proposed} - CCFP_{Current}$

The calculations for each ILRT option are summarized below.

	Class1 Freq	Class 3a Freq	Sum Freq of NCF	CDF	CCFP	Delta from base	Delta from Current
Baseline	1.21E-06	1.15E-07	1.33E-06	4.27E-06	6.89E-01		
1 in 10	9.18E-07	3.84E-07	1.30E-06	4.27E-06	6.95E-01	0.63%	
1 in 15	7.06E-07	5.76E-07	1.28E-06	4.27E-06	7.00E-01	1.08%	0.45%

4.2.8 Summary of Alternate Methodology Results

Table 4.2-5 provides a summary of the results for the extension of the ILRT test frequency from 1 in 10 years to 1 in 15 years using the alternate methodology.

Table 4.2-5 Summary of Results (Alternate Methodology)

	3 in 10yr	1 in 10yr	1 in 15yr
Total Risk	1.838E+01	1.859E+01	1.874E+01
ILRT Risk Contribution (%)	0.53%	1.73%	2.58%
Increase from Base		1.13%	1.93%
Increase from Current			0.80%
LERF value due to ILRT	1.15E-08	3.84E-08	5.76E-08
Increase from Base		2.69E-08	4.61E-08
Increase from Current			1.92E-08
CCFP	6.89E-01	6.95E-01	7.00E-01
Increase from Base		0.63%	1.08%
Increase from Current			0.45%

Based on the above results, the extension of the ILRT test interval from the current interval of once in 10 years to once in 15 years does not pose a significant increase in risk to the public. The LERF value is within the Region 3 of Regulatory Guide 1.174 (very small) guidance and is considered acceptable.

5.0 Drywell Bypass Test

The current interval for the GGNS drywell bypass test (DWBT) surveillance is one in ten years. Since the DWBT and the ILRT require some of the same equipment and steps and since they both have been on the same schedule frequency, it is desirable to extend the DWBT also. This will allow the two tests to remain on the same test frequency. However, neither the previously approved nor the alternate methodologies address the DWBT.

The DWBT verifies that pre-existing drywell bypass leakage does not exceed the maximum allowed leakage. The DWBT acceptance criterion in the Tech Specs is <10% of the analyzed design limit. The design bypass limit is used to establish the timing of automatic containment sprays following a LOCA. The sprays effectively control the containment pressure to less than its design limit (15 psi) by suppressing the steam from the drywell that bypasses the suppression pool. The DWBT thus affects the likelihood of suppression pool bypass in the level 1 and 2 PSA analyses.

Even though the methodologies used for the ILRT extension do not directly address the DWBT, it is judged that these two methodologies can be used to address the impact of extending both the ILRT and DWBT with a few additional considerations and assumptions.

5.1 Drywell Bypass Test Assumptions

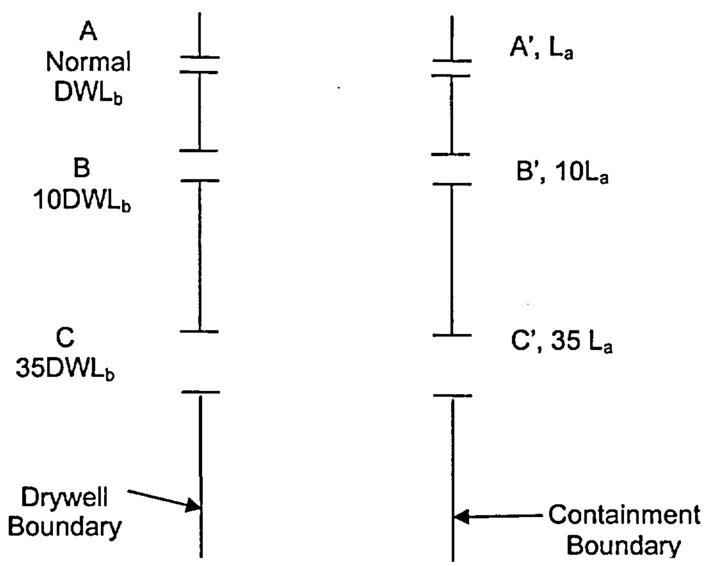
Additional assumptions are necessary in order to apply the ILRT assumptions to the DWBT evaluation.

1. Since the start of plant operation, GGNS has performed six DWBTs. The last 2 test results were 618 scfm and 869 scfm. Therefore, base drywell leakage (DWL_b) is assumed to be 900 scfm. This bounds the last test that was performed and is reasonable considering the ongoing surveillance testing.
2. The characterization of increased leakage associated with DWBTs will be based on the ILRT methodologies. That is, the leakage for a small pre-existing leak is assumed to be 10 DWL_b (or 9000 scfm) and the leakage for a large pre-existing leak is assumed to be 35 DWL_b (or 31,500 scfm). This is considered conservative. Even though the drywell design pressure is 30 psig, the maximum sustained differential pressure between the drywell and the containment is 3 psi.
3. The design basis for drywell leakage is equivalent to 35,000 scfm. Containment pressure is controlled to its design pressure as long as the containment sprays operate. Since the leakage for both DBWT leakage categories is below this design value, the assumption will be made that as long as containment sprays operate, there will be no impact on the containment's existing leakage category.
4. If containment sprays do not operate, the assumption is that any increased drywell leakage above DWL_b will lead to containment failure. This is considered a conservative assumption, since not all accident sequences without sprays will lead to containment failure. As noted in Section 6. 2 of the GGNS UFSAR, the acceptable drywell bypass leakage with a large LOCA type break is much higher than with a small break LOCA. Also, the containment ultimate pressure capacity (~approximately 70 psia) is over 2 times the design pressure of containment (29.7 psia) which provides additional margin. This assumption results in an increase in the frequency of EPRI Class 7 sequences rather than Class 3a or 3b.
5. The baseline accident doses are assumed to be the same as those utilized in the ILRT extension analyses.

5.2 Drywell Bypass Methodology

The primary difference in the methodology used to evaluate the extension of the DWBT is in the determination of the conditional probability of an existing drywell leak. The same failure frequencies, accident doses, consequence calculations, and acceptance criteria were used. The analysis was performed assuming that both the ILRT and the DWBT are performed on the same frequencies.

With the Mark III containment, the drywell is completely enclosed by the outer containment. As such, drywell leakage does not leak directly to the environment but is further mitigated by the outer containment leakage barrier. If containment sprays operate this leakage is "scrubbed" of fission products to the suppression pool. Because of this "dual" containment, there are several possible leakage path combinations that must be considered. The drywell can be intact (base leakage assumed), it can have a small pre-existing failure (10 time base leakage), or it can have a large pre-existing failure (35 time base leakage). The probability of each of these drywell failure categories is assumed to be the same as the equivalent categories for the ILRT evaluations. This results in at least nine combinations of drywell and containment leakage sizes. The figure below presents a graphical representation of potential leakage categories for the drywell and containment.



The assignment of each of these combinations to an original containment failure category depends on the consideration of the availability of the containment spray system. If containment sprays are available, the combination of drywell and containment leakage is categorized based on the containment leakage category. If containment sprays are not available, the combination of drywell and containment leakage is assumed to result in containment failure (Class 7) except for the combinations with base drywell bypass leakage. The combinations with base drywell leakage (DWL_b) are assumed to have the same categories as the base case ILRT evaluation. Table 5-1 summarizes the classification of combinations into the EPRI accident classes.

Table 5-1 DWBT and ILRT Leakage Combination Accident Classes

Leakage Combinations	DW Bypass Leakage	Containment Leakage	EPRI Class Assignment
AA'	1 DWL_b	1 L_a	1
AB'	1 DWL_b	10 L_a	3a

Leakage Combinations	DW Bypass Leakage	Containment Leakage	EPRI Class Assignment
AC'	1 DWL_b	35 L_a	3b
BA'1 CS Available	10 DWL_b	1 L_a	1
BA'2 CS Not Available	Note 1	Note 1	7
BB'1 CS Available	10 DWL_b	10 L_a	3a
BB'2 CS Not Available	Note 1	Note 1	7
BC'1 CS Available	10 DWL_b	35 L_a	3b
BC'2 CS Not Available	Note 1	Note 1	7
CA'1 CS Available	35 DWL_b	1 L_a	1
CA'2 CS Not Available	Note 1	Note 1	7
CB'1 CS Available	35 DWL_b	10 L_a	3a
CB'2 CS Not Available	Note 1	Note 1	7
CC'1 CS Available	35 DWL_b	35 L_a	3b
CC'2 CS Not Available	Note 1	Note 1	7

Note 1. Containment failure assumed to occur.

The probability for each combination in Table 5-1 is determined by multiplying the conditional probabilities for DWBT and ILRT category by each other. For those cases where containment spray is a factor, the probability of the combination of DWBT and ILRT is multiplied by the probability that containment spray is available or is not available as applicable.

The only other change in the methodology to address the DWBT is the need to increase the containment failure due to phenomenology class (Class 7) frequency for the extended test frequencies. This is done in a manner similar to the method applied to Class 3a and 3b. That is, the Class 1 frequency is also adjusted downward for the Class 7 frequency increase in order to maintain the same total CDF. The DWBT frequency extension will be evaluated using both the conditional leak size probabilities and the alternate conditional leak size probabilities of the previously approved methodology.

The remaining portions of the DWBT methodologies are identical to that of the previously approved and alternate ILRT methodologies.

5.3 Containment Spray Availability

The availability of containment spray is determined using the Revision 2 GGNS PRA model. The containment spray gate in the fault tree model was solved and the resulting cutsets were delete-termed from the overall Revision 2 PRA results cutset file to obtain the cutsets which do not have events which would fail containment spray. Containment spray would be available for each of these cutsets. The total frequency for these cutsets is 2.64E-6/yr. Therefore the probability that containment spray is available is determined as follows:

$$P_{CS\ Available} = \text{Frequency of cutsets with CS available/Overall CDF}$$
$$= 2.64E\text{-}6/4.27E\text{-}6$$
$$= 0.618$$

The probability that containment spray is not available is:

$$P_{CS\ Not\ Available} = 1 - P_{CS\ Available}$$
$$= 0.382$$

These values are used in the determination of combined leakage probabilities. They are conservative since there is no consideration of the recovery of containment sprays.

5.4 DWBT Evaluation Using Previously Approved Methodology Conditional Probabilities

5.4.1 Frequency Calculations

The conditional probability of the different combinations of DWB and ILRT leakage are calculated using a probability of 0.064 for a small leak and 0.021 for a large leak. These probabilities that are from the previously approved methodology. The probability that containment spray is available is also factored in for certain combinations. The calculations are summarized in Table 5.4-1.

Table 5.4-1 Conditional Probability of Combined Leakage

Leakage Combinations	DW Bypass Leakage	Ctmt. Leakage	DW Leakage Prob	Prob of CS	Ctmt Leakage Prob	Combined Prob	EPRI Class Assignment
AA'	1 DWL_B	1 La	~1.0	NA	~1.0	~1.0	1
AB'	1 DWL_B	10 La	~1.0	NA	6.4E-02	6.4E-02	3a
AC'	1 DWL_B	35 La	~1.0	NA	2.1E-02	2.1E-02	3b
BA'1 CS Available	10 DWL_B	1 La	6.4E-02	6.18E-01	~1.0	4.0E-02	1
BA'2 CS Not Available			6.4E-02	3.82E-01	~1.0	2.4E-02	7
BB'1 CS Available	10 DWL_B	10 La	6.4E-02	6.18E-01	6.4E-02	2.5E-03	3a
BB'2 CS Not Available			6.4E-02	3.82E-01	6.4E-02	1.6E-03	7
BC'1 CS Available	10 DWL_B	35 La	6.4E-02	6.18E-01	2.1E-02	8.3E-04	3b
BC'2 CS Not Available			6.4E-02	3.82E-01	2.1E-02	5.1E-04	7
CA'1 CS Available	35 DWL_B	1 La	2.1E-02	6.18E-01	~1.0	1.3E-02	1
CA'2 CS Not Available			2.1E-02	3.82E-01	~1.0	8.0E-03	7
CB'1 CS Available	35 DWL_B	10 La	2.1E-02	6.18E-01	6.4E-02	8.3E-04	3a
CB'2 CS Not Available			2.1E-02	3.82E-01	6.4E-02	5.1E-04	7
CC'1 CS Available	35 DWL_B	35 La	2.1E-02	6.18E-01	2.1E-02	2.7E-04	3b
CC'2 CS Not Available			2.1E-02	3.82E-01	2.1E-02	1.7E-04	7

Note: The baseline leakage probabilities for both DW bypass and containment leakage has been assumed to be 1.0 in the calculation of the combined probabilities. It is actually slightly smaller (i.e., 1.0 - 0.064 – 0.021) than 1.0. This results in a slightly higher and conservative combined probability for Class 7.

The overall conditional probability of Class 3a is the summation of combined probability for each combination that is categorized as Class 3a. The Class 3b probability is determined in the same manner.

Class 3a probability = 6.4E-02 + 2.53E-03 + 8.31E-04 = 6.74E-02

Class 3b probability = 2.1E-02 + 8.31E-04 + 2.73E-04 = 2.21E-02

The baseline frequency of the Class 3a and 3b accident classes is then found by multiplying their probability times the total CDF from the GGNS level 1 PRA.

Class 3a frequency = 6.74E-02 X 4.27E-6/yr = 2.88E-07/yr
Class 3b frequency = 2.21E-02 X 4.27E-6/yr = 9.44E-08/yr

In addition, the conditional probability due to DWBT and ILRT leakage for Class 7 must also be calculated. This will be used to increase the Class 7 frequency.

Class 7 probability = 2.44E-02+1.56E-03+5.13E-04+8.02E-03+5.13E-04+1.68E-04
= 3.52E-02

The baseline Class 7 frequency due to DWBT and ILRT leakage is calculated by multiplying the Class 7 conditional probability times the total CDF from the GGNS level 1 PRA. The total Class 7 frequency is then determined by adding this frequency to the Class 7 frequency from Table 4.1-3.

Class 7 DWBT & ILRT frequency = 3.52E-02 X 4.27E-06/yr = 1.5E-07/yr

Updated Class 7 frequency = 1.5E-07/yr + 2.93E-06/yr = 3.08E-06/yr

The updated Class 1 frequency is calculated by subtracting the Class 3a, 3b and Class 7 DWBT & ILRT frequencies from the original Class 1 frequency (that is, the original NCF frequency). This ensures that the total CDF does not change.

Class 1 frequency = 1.34E-6/yr – 2.88E-07/yr – 9.44E-08/yr – 1.5E-07/y
= 8.08E-07/yr

A summary of the baseline class frequencies is provided in Table 5.4-2.

Table 5.4-2 DWBT Baseline Class Frequencies (Previously Approved Methodology)

Class Number	Description	Base Frequency	Percentage of Total
1	No Containment Failure	8.08E-07	18.92%
2	Failure of isolation system -- Not analyzed	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	2.88E-07	6.74%
3b	Large pre-existing leak in containment structure or liner	9.44E-08	2.21%
4	Type B -- Not analyzed	N/A	N/A

Class Number	Description	Base Frequency	Percentage of Total
5	Type C -- Not analyzed	N/A	N/A
6	Other isolation failures -- Not analyzed	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)	3.08E-06	72.13%
8	Containment Bypass --Not analyzed	N/A	N/A
	Total Frequency	4.27E-06	

5.4.2 Baseline Man-Rem/Yr Values

As indicated before, the evaluation of the DWBT extension used the accident dose estimates developed for the evaluation of the ILRT extension which are developed in Section 4.1.4. A summary of the accident release (man-rem) and the risk (man-rem/year) calculated for each class is contained in Table 5.4-3.

Table 5.4-3 DWBT Baseline Class Risk (Previously Approved Methodology)			
Class	Frequency (per reactor-year)	Release (man-rem)	Base Risk (man-rem/year)
1	8.08E-07	6.22E4	5.02E-02
2	N/A	N/A	N/A
3a	2.88E-07	6.22E5	1.79E-01
3b	9.44E-08	2.18E6	2.05E-01
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	3.08E-06	6.22E6	1.91E+01
8	N/A	N/A	N/A
	TOTAL MANREM/Yr:		1.958E+01

5.4.3 Increase in DWBT Frequencies

For this case, the increases in the Class 3a and 3b frequencies are those used in the previously approved ILRT methodology. These increases are also applied to the increase Class 7 frequency due to the DWBT. The increase factors are 1.1 for the 10 year test interval and 1.15 for the 15 year test interval. The changes in Class 3a, 3b and 7 frequencies, as well as the adjustments to the Class 1 frequencies when these increases are taken into account are documented in Table 5.4-4.

Table 5.4-4 Class Frequencies for Different DWBT Frequencies (Previously Approved Methodology)				
Class	Description	Base	1 in 10	1 in 15
1	No Containment Failure	8.08E-07	7.55E-07	7.28E-07
2	Failure of isolation system -- Not analyzed	N/A	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	2.88E-07	3.16E-07	3.31E-07
3b	Large pre-existing leak in containment structure or liner	9.44E-08	1.04E-07	1.09E-07
4	Type B -- Not analyzed	N/A	N/A	N/A
5	Type C -- Not analyzed	N/A	N/A	N/A
6	Other isolation failures -- Not analyzed	N/A	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)	3.08E-06	3.10E-06	3.10E-06
8	Containment Bypass --Not analyzed	N/A	N/A	N/A
	Total Frequency	4.27E-06	4.27E-06	4.27E-06

5.4.4 Change in Man-rem/yr, LERF and CCFP

The impact of extended DWBT frequencies on risk can be determined using the information in Tables 5.4-3 and 5.4-4. The risk results for the different test frequencies are included in Table 5.4-5.

Table 5.4-5 Risk for Different DWBT Frequencies (Previously Approved Methodology)

		Risk, man-rem/yr		
Class	**Description**	**Base**	**1 in 10**	**1 in 15**
1	No Containment Failure	5.02E-02	4.69E-02	4.53E-02
2	Failure of isolation system -- Not analyzed	N/A	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	1.79E-01	1.97E-01	2.06E-01
3b	Large pre-existing leak in containment structure or liner	2.05E-01	2.26E-01	2.36E-01
4	Type B -- Not analyzed	N/A	N/A	N/A
5	Type C -- Not analyzed	N/A	N/A	N/A
6	Other isolation failures -- Not	N/A	N/A	N/A

		Risk, man-rem/yr		
Class	Description	Base	1 in 10	1 in 15
	analyzed			
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)*	1.91E+01	1.92E+01	1.93E+01
8	Containment Bypass --Not analyzed	N/A	N/A	N/A
	TOTAL MANREM/Yr:	1.958E+01	1.971E+01	1.977E+01
	*DWBT Contribution to Class 7	9.35E-01	1.03E+00	1.08E+00
	Change from Baseline Man-Rem/yr		1.29E-01	1.93E-01
	ILRT/DWBT Contribution	6.74%	7.36%	7.67%
	% increase from Base:		0.66%	0.99%
	Change from 1in 10 to 1 in 15:			6.43E-02
	% Change from 1 in 10 to 1 in 15:			0.33%

The change in LERF for extending the DWBT frequency is the increase due to the change in the large pre-existing leak class, Class 3b, and the increase in the portion of Class 7 due to DWBT. As in the previous evaluations, the Class 3a leak size is too small to be considered a LERF. This increase is documented below.

	Base	1 in 10	1 in 15
Class 3b Frequency	9.44E-08	1.04E-07	1.09E-07
Class 7 due to DWBT	1.50E-07	1.65E-07	1.73E-07
Total LERF	2.45E-07	2.69E-07	2.82E-07
Delta LERF from Base		2.45E-08	3.67E-08
Delta LERF from 1 in 10 to 1 in 15			1.22E-08

The change in CCFP is considered to be the change in containment failure probability given an accident. This can be calculated as follows:

CCFP = 1 – Frequency of NCF/CDF
NCF = Non Containment Failure Classes
Frequency of NCF = Class 1 frequency + Class 3a frequency
Delta CCFP = $CCFP_{Proposed} - CCFP_{Current}$

The calculations for each DWBT option are summarized below.

	Class1 Freq	Class 3a Freq	Sum (Freq of NCF)	CDF	CCFP	Delta from base	Delta from Current
Baseline	8.08E-07	2.88E-07	1.10E-06	4.27E-06	7.43E-01		
1 in 10	7.55E-07	3.16E-07	1.07E-06	4.27E-06	7.49E-01	0.57%	
1 in 15	7.28E-07	3.31E-07	1.06E-06	4.27E-06	7.52E-01	0.86%	0.29%

5.4.5 Summary of DWBT Results (Previously Approved Methodology)

Table 5.4-6 provides a summary of the results for the extension of the DWBT frequency (in conjunction with the ILRT extension) from 1 in 10 years to 1 in 15 years.

Table 5.4-6 Summary of DWBT Results (Previously Approved Methodology)

	3 in 10yr	1 in 10yr	1 in 15yr
Total Risk	1.958E+01	1.971E+01	1.977E+01
DWBT Risk Contribution (%)	6.74%	7.36%	7.67%
Increase from Base		0.66%	0.99%
Increase from Current			0.33%
LERF value due to DWBT	2.45E-07	2.69E-07	2.82E-07
Increase from Base		2.45E-08	3.67E-08
Increase from Current			1.22E-08
CCFP	7.43E-01	7.49E-01	7.52E-01
Increase from Base		0.57%	0.86%
Increase from Current			0.29%

Based on the above results, the extension of the DWBT (in conjunction with an extension of the ILRT) surveillance interval from the current interval of once in 10 years to once in 15 years does not pose a significant increase in risk to the public. The LERF value is within Region 3 of Regulatory Guide 1.174 (very small) guidance and is considered acceptable.

5.5 DWBT Evaluation Using Alternate Methodology Conditional Probabilities

5.5.1 Frequency Calculations

The conditional probabilities of the different combinations of DWBT and ILRT leakage are calculated using a probability of 0.027 for a small leak and 0.0027 for a large leak. The probability that containment spray is available is also factored in for certain combinations. The calculations are summarized in Table 5.5-1.

Table 5.5-1 Conditional Probability of Combined Leakage (Alternate Methodology)

Leakage Combinations	DW Bypass Leakage	Ctmt. Leakage	DW Leakage Prob	Prob of CS	Ctmt. Leakage Prob	Combined Prob	EPRI Class Assignment
AA'	1 DWL_B	1 La	~1.0	NA	~1.0	~1.0	1
AB'	1 DWL_B	10 La	~1.0	NA	2.7E-02	2.7E-02	3a
AC'	1 DWL_B	35 La	~1.0	NA	2.7E-03	2.7E-03	3b
BA'1 CS Available	10 DWL_B	1 La	2.7E-02	6.18E-01	~1.0	1.67E-02	1
BA'2 CS Not Available			2.7E-02	3.82E-01	~1.0	1.03E-02	7
BB'1 CS Available	10 DWL_B	10 La	2.7E-02	6.18E-01	2.7E-02	4.51E-04	3a
BB'2 CS Not Available			2.7E-02	3.82E-01	2.7E-02	2.78E-04	7
BC'1 CS Available	10 DWL_B	35 La	2.7E-02	6.18E-01	2.7E-03	4.51E-05	3b
BC'2 CS Not Available			2.7E-02	3.82E-01	2.7E-03	2.78E-05	7
CA'1 CS Available	35 DWL_B	1 La	2.7E-03	6.18E-01	~1.0	1.67E-03	1
CA'2 CS Not Available			2.7E-03	3.82E-01	~1.0	1.03E-03	7

Leakage Combinations	DW Bypass Leakage	Ctmt. Leakage	DW Leakage Prob	Prob of CS	Ctmt. Leakage Prob	Combined Prob	EPRI Class Assignment
CB'1 CS Available	35 DWL_B	10 La	2.7E-03	6.18E-01	2.7E-02	4.51E-05	3a
CB'2 CS Not Available			2.7E-03	3.82E-01	2.7E-02	2.78E-05	7
CC'1 CS Available	35 DWL_B	35 La	2.7E-03	6.18E-01	2.7E-03	4.51E-06	3b
CC'2 CS Not Available			2.7E-03	3.82E-01	2.7E-03	2.78E-06	7

Note: The baseline leakage probabilities for both DW bypass and containment leakage has been assumed to be 1.0 in the calculation of the combined probabilities. It is actually slightly smaller (i.e., 1.0 - 0.027 – 0.0027) than 1.0. This results in a slightly higher and conservative combined probability for Class 7.

The overall conditional probability of Class 3a is the summation of combined probabilities for each combination that is categorized as Class 3a. The Class 3b probability is determined in the same manner.

Class 3a probability = 2.7E-02 + 4.51E-04 + 4.51E-05 = 2.75E-02
Class 3b probability = 2.7E-03 + 4.51E-05 + 4.51E-06 = 2.75E-03

The baseline frequency of the Class 3a and 3b accident classes is then found by multiplying their probabilities time the total CDF from the GGNS level 1 PRA.

Class 3a frequency = 2.75E-02 X 4.27E-6/yr = 1.17E-07/yr
Class 3b frequency = 2.75E-03 X 4.27E-6/yr = 1.17E-08/yr

The conditional probability due to DWBT and ILRT leakage for Class 7 must also be calculated. This will be used to increase the Class 7 frequency.

Class 7 probability = 1.03E-02+2.78E-04+2.78E-05+1.03E-03+2.78E-05+2.78E-06
= 1.17E-02

The baseline incremental Class 7 frequency due to DWBT and ILRT leakage is calculated by multiplying the Class 7 conditional probability times the total CDF from the GGNS level 1 PRA. The total Class 7 frequency is then determined by adding this frequency to the Class 7 frequency from Table 4.1-3.

Class 7 DWBT & ILRT frequency = 1.17E-02 X 4.27E-06/yr = 4.99E-08/yr

Updated Class 7 frequency = 4.99E-08/yr + 2.93E-06/yr = 2.98E-06/yr

The updated Class 1 frequency is calculated by subtracting the Class 3a, 3b and Class 7 DWBT & ILRT frequencies from the original Class 1 frequency. This ensures that the total CDF does not Change.

Class 1 frequency = 1.34E-06/yr – 1.17E-07/yr – 1.17E-08/yr – 4.99E-08/yr
= 1.16E-06/yr

A summary of the baseline class frequencies is provided in Table 5.5-2.

Table 5.5-2 DWBT Baseline Class Frequencies (Alternate Methodology)

Class	Description	Base Frequency	Percentage of Total
1	No Containment Failure	1.16E-06	27.20%
2	Failure of isolation system -- Not analyzed	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	1.17E-07	2.75%
3b	Large pre-existing leak in containment structure or liner	1.17E-08	0.27%
4	Type B -- Not analyzed	N/A	N/A
5	Type C -- Not analyzed	N/A	N/A
6	Other isolation failures -- Not analyzed	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)	2.98E-06	69.78%
8	Containment Bypass --Not analyzed	N/A	N/A
	Total Frequency	4.27E-06	

5.5.2 DWBT Baseline Accident Class Dose Rates

The evaluation of the DWBT extension will use the accident dose estimates from the evaluation of the ILRT extension which were developed in Section 4.1.4. A summary of the accident releases (man-rem) and the associated risk (man-rem/year) calculated for each class is contained in Table 5.5-3.

Table 5.5-3 DWBT Baseline Class Risk (Alternate Methodology)

Class	Frequency (per reactor-year)	Release (man-rem)	Base
1	1.16E-06	6.22E4	7.22E-02
2	N/A	N/A	N/A
3a	1.17E-07	6.22E5	7.30E-02
3b	1.17E-08	2.18E6	2.55E-02
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	2.98E-06	6.22E6	1.85E+01
8	N/A	N/A	N/A
	TOTAL MANREM/Yr:		1.869E+01

5.5.3 Change in Probability of Leakage Detectable by DWBT

For this case, the increase in the Class 3a and 3b frequencies are determined using the factors from the alternate ILRT methodology (Section 4.2.5). These factors are also applied to the increase in Class 7 frequency due to the DWBT. The increase factors are 3.333 for the 10 year test interval and 5 for the 15 year test interval. The changes in Class 3a, 3b and 7 frequencies, as well as the adjustments to the Class 1 frequencies when these increases are taken into account are documented in Table 5.5-4.

Table 5.5-4 Class Frequencies for Different DWBT Frequencies (Alternate Methodology)

Class	Description	Base	1 in 10	1 in 15
1	No Containment Failure	1.16E-06	7.44E-07	4.45E-07
2	Failure of isolation system -- Not analyzed	N/A	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	1.17E-07	3.91E-07	5.87E-07
3b	Large pre-existing leak in containment structure or liner	1.17E-08	3.91E-08	5.87E-08
4	Type B -- Not analyzed	N/A	N/A	N/A
5	Type C -- Not analyzed	N/A	N/A	N/A
6	Other isolation failures -- Not analyzed	N/A	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)	2.98E-06	3.10E-06	3.18E-06
8	Containment Bypass --Not analyzed	N/A	N/A	N/A
	Total Frequencies	4.27E-06	4.27E-06	4.27E-06

5.5.4 Determine Population Dose Rate

The impact of extended DWBT frequencies on risk can be determined using the information in Table 5.5-3 and 5.5-4. The risk results for the different test frequencies are included in Table 5.5-5.

Table 5.5-5 Risk for Different DWBT Frequencies (Alternate Methodology)

		Risk, man-rem/yr		
Class	**Description**	**Base**	**1 in 10**	**1 in 15**
1	No Containment Failure	7.22E-02	4.62E-02	2.77E-02
2	Failure of isolation system -- Not analyzed	N/A	N/A	N/A
3a	Small pre-existing leak in containment structure or liner	7.30E-02	2.43E-01	3.65E-01
3b	Large pre-existing leak in containment structure or liner	2.55E-02	8.51E-02	1.28E-01
4	Type B -- Not analyzed	N/A	N/A	N/A
5	Type C -- Not analyzed	N/A	N/A	N/A
6	Other isolation failures -- Not analyzed	N/A	N/A	N/A
7	Failure induced by severe accident phenomena (Early and Late Failures, also MSIV venting)*	1.85E+01	1.92E+01	1.98E+01
8	Containment Bypass --Not analyzed	N/A	N/A	N/A
	TOTAL MANREM/Yr:	1.869E+01	1.962E+01	2.028E+01
	*DWBT Contribution to Class 7	3.10E-01	1.03E+00	1.55E+00
	Change from Baseline Man-Rem/yr		9.27E-01	1.59E+00
	ILRT/DWBT Contribution	2.19%	6.94%	10.07%
	% increase from Base:		4.96%	8.51%
	Change from 1in 10 to 1 in 15:			6.62E-01
	% Change from 1 in 10 to 1 in 15:			3.38%

5.5.5 Change in LERF and CCFP

The change in LERF for extending the DWBT frequency is the increase due to the change in large pre-existing leak class, Class 3b, and the increase in the portion of Class 7 due to DWBT. As in the previous evaluations, the Class 3a leak size is too small to be considered a LERF. This increase is documented below.

Change in LERF is represented by the change in Classes 3b and 7 frequencies

	Base	1 in 10	1 in 15
Class 3b Frequency	1.17E-08	3.91E-08	5.87E-08
Class 7 due to DWBT	4.99E-08	1.66E-07	2.49E-07
Total LERF	6.16E-08	2.05E-07	3.08E-07
Delta LERF from Base		1.44E-07	2.46E-07
Delta LERF from 1 in 10 to 1 in 15			1.03E-07

The change in CCFP is considered to be the change in containment failure probability given an accident. This can be calculated as follows:

CCFP = 1 – Frequency of NCF/CDF
NCF = Non Containment Failure Classes

Frequency of NCF = Class 1 frequency + Class 3a frequency
Delta CCFP = $CCFP_{Proposed} - CCFP_{Current}$

The calculations for each DWBT option are summarized below.

	Class1 Freq	Class 3a Freq	Sum	CDF	CCFP	Delta from base	Delta from Current
Baseline	1.16E-06	1.17E-07	1.28E-06	4.27E-06	7.01E-01		
1 in 10	7.44E-07	3.91E-07	1.13E-06	4.27E-06	7.34E-01	3.37%	
1 in 15	4.45E-07	5.87E-07	1.03E-06	4.27E-06	7.58E-01	5.77%	2.41%

5.5.6 Summary of DWBT Results (Alternate Methodology)

Table 5.5-6 provides a summary of the results for the extension of the DWBT frequency (in conjunction with the ILRT extension) for 1 in 10 years to 1 in 15 years.

Table 5.5-6 Summary of DWBT Results (Alternate Methodology)

	3 in 10yr	1 in 10yr	1 in 15yr
Total Risk	1.869E+01	1.962E+01	2.028E+01
DWBT Risk Contribution (%)	2.19%	6.94%	10.07%
Increase from Base		4.96%	8.51%
Increase from Current			3.38%
LERF value due to ILRT	6.16E-08	2.05E-07	3.08E-07
Increase from Base		1.44E-07	2.46E-07
Increase from Current			1.03E-07
CCFP	7.01E-01	7.34E-01	7.58E-01
Increase from Base		3.37%	5.77%
Increase from Current			2.41%

Based on the above results, the extension of the DWBT (in conjunction with an extension of the ILRT) surveillance interval from the current interval of once in 10 years to once in 15 years does not pose a significant increase in risk to the public. The increase in LERF from a test interval of one in 10 years to an interval of one in 15 years using this conservative methodology is determined to be 1.03E-07. This is right on the border line between "very small" (Region III) and "small" (Region II) risk change using the Regulatory Guide 1.174 acceptance guidance. This is considered acceptable. The DWBT contribution to risk for the one in 15 year frequency case is calculated to be 10.07% which is an increase of 3.38% over the contribution for the one in 10 year frequency case. This is considered a very conservative number due to the method of calculation. The method conservatively classifies those combinations of increased DWBT and ILRT leakage without containment sprays as Class 7 (a large containment failure). In all likelihood some portion of the combinations would be made up of Class 3a and 3b sequences. Another conservatism in the methodology is the use of overall CDF to calculate the increased Class 7 frequency. A large portion of the total CDF (~69%) is already classified as Class 7, so this method over-estimates the increase in Class 7 frequency as well as the Class 3a and 3b frequencies. If the Class 3a, Class 3b, and increased Class 7 frequencies are based on the portions of CDF with no containment failure (31.4% of total CDF or 1.34E-6/yr), the overall results are much lower. This more realistic treatment (Alternative 3) results in a 3.39% contribution to risk for the DWBT and an increase in risk of only 1.11% for an increase from the current test frequency to one in 15 years. In addition the increase in LERF is 3.22E-8/yr which is well below the regulatory guide guidance. A summary of these results are presented in the table below.

Table 5.5-7 Summary of DWBT Alternative 3

	3 in 10yr	**1 in 10yr**	**1 in 15yr**
Total Risk	1.842E+01	1.871E+01	1.892E+01
DWBT Risk Contribution (%)	0.70%	2.29%	3.39%
Increase from Base		1.58%	2.71%
Increase from Current			1.11%
LERF value due to ILRT	1.93E-08	6.45E-08	9.67E-08
Increase from Base		4.51E-08	7.74E-08
Increase from Current			3.22E-08
CCFP	6.91E-01	7.01E-01	7.09E-01
Increase from Base		1.06%	1.81%
Increase from Current			0.76%

6.0 Risk Summary

An evaluation of extending the GGNS ILRT surveillance frequency from once in 10 years to once in 15 years has been performed using two methodologies. The results of both of these evaluations indicate that the proposed extension has a minimal impact on risk and is therefore acceptable. The results from the application of both methodologies are reproduced in Table 6-1.

An evaluation of extending the GGNS DWBT surveillance frequency from once in 10 years to once in 15 years has been performed using methodologies based on the ILRT methodologies. This evaluation assumed that the DWBT frequency was being adjusted in conjunction with the ILRT frequency. An additional analysis (alternative 3) was also performed which was based on the alternate methodology. This analysis used a more realistic, but still conservative, assumption with regard to developing the frequency of leakage classes associated with the DWBT. The results from the application of the methodologies are reproduced in Table 6-2. The results from these conservative analyses indicate that the proposed extension of the DWBT frequency has a minimal impact on plant risk and is therefore acceptable.

Table 6-1 Comparison and Summary of ILRT Evaluation Results

	Previously Approved Methodology			Alternate Methodology		
	3 in 10yr	1 in 10yr	1 in 15yr	3 in 10yr	1 in 10yr	1 in 15yr
Total Risk	1.863E+01	1.867E+01	1.869E+01	1.838E+01	1.859E+01	1.874E+01
ILRT Risk Contribution (%)	1.96%	2.15%	2.25%	0.53%	1.73%	2.58%
Increase from Base		0.18%	0.28%		1.13%	1.93%
Increase from Current			0.09%			0.80%
LERF value due to ILRT	8.97E-08	9.86E-08	1.03E-07	1.15E-08	3.84E-08	5.76E-08
Increase from Base		8.97E-09	1.35E-08		2.69E-08	4.61E-08
Increase from Current			4.48E-09			1.92E-08
CCFP	7.07E-01	7.09E-01	7.10E-01	6.89E-01	6.95E-01	7.00E-01
Increase from Base		0.21%	0.31%		0.63%	1.08%
Increase from Current			0.11%			0.45%

Table 6-2 Comparison and Summary of DWBT Evaluation Results

	Based on Previously Approved Methodology			Based on Alternate Methodology			Based on Alternative 3 Methodology		
	3 in 10yr	**1 in 10yr**	**1 in 15yr**	**3 in 10yr**	**1 in 10yr**	**1 in 15yr**	**3 in 10yr**	**1 in 10yr**	**1 in 15yr**
Total Risk	1.958E+01	1.971E+01	1.977E+01	1.869E+01	1.962E+01	2.028E+01	1.842E+01	1.871E+01	1.892E+01
DWBT Risk Contribution (%)	6.74%	7.36%	7.67%	2.19%	6.94%	10.07%	0.70%	2.29%	3.39%
Increase from Base		0.66%	0.99%		4.96%	8.51%		1.58%	2.71%
Increase from Current			0.33%			3.38%			1.11%
LERF value due to DWBT	2.45E-07	2.69E-07	2.82E-07	6.16E-08	2.05E-07	3.08E-07	1.93E-08	6.45E-08	9.67E-08
Increase from Base		2.45E-08	3.67E-08		1.44E-07	2.46E-07		4.51E-08	7.74E-08
Increase from Current			1.22E-08			1.03E-07			3.22E-08
CCFP	7.43E-01	7.49E-01	7.52E-01	7.01E-01	7.34E-01	7.58E-01	6.91E-01	7.01E-01	7.09E-01
Increase from Base		0.57%	0.86%		3.37%	5.77%		1.06%	1.81%
Increase from Current			0.29%			2.41%			0.76%

Note: Evaluation results above assume that the ILRT and DWBT are on identical test intervals.

History of Successful Tests

7.0 Test History

7.1 ILRT Test Results

A summary of the ILRT test results is presented in the following table.

Table 7.1-1 Summary of ILRT Test Results

		Measured Leakage Rate		95% UCL (wt%/day)	
Outage	**Mo/Day/Year**	**Mass Pt.**	**Total Time**	**Mass Pt.**	**Total Time**
Pre-Op	1/5/1982	0.072	0.068	0.079	0.139
Init-Op	11/4/1985	0.141	0.133	0.145	0.187
RF03	4/16/1989	0.125	0.127	0.129	0.178
RF06	11/21/1993	0.228	0.118	0.155	0.210

The acceptance criterion for the ILRT is 0.75 L_a. At the time of these tests the limit was 0.328 wt%/day. The current limit would be 0.512 wt%/day. This was changed as part of the implementation of the alternate source term (TAC NO. MA8065). The first test was a preoperational test performed under a special test procedure. Commercial operation began on July 1, 1985.

7.2 DWBT Test Results

A summary of the DWBT results are presented below:

Table 7.2-1 Summary of DWBT Test Results

TS Acceptance Criterion 3500 scfm (original limit)		
Outage	**Mo/Day/Year**	**Drywell Bypass Leakage (SCFM)**
Pre-Op	1/5/1982	610.45
	3/14/1983	1621.00
	6/14/1984	2599.17
	11/6/1985	2315.00
RFO1	11/11/1986	1568.40
RFO2	12/30/1987	1500.30
RFO3	4/15/1989	1631.01
RFO4	11/20/1990	1591.00
RFO5	5/31/1992	618.20
RFO6	11/24/1993	868.73

The first test was a preoperational test performed under a special test procedure. Commercial operation began on July 1, 1985.

8.0 Monitoring Drywell Leakage

On August 1, 1996, the NRC issued an amendment to the GGNS Facility Operating License (TAC NO. M94176) that revised the TS to allow a performance-based drywell bypass leakage surveillance test. The NRC requested that GGNS monitor the drywell for significant leakage during operation. GGNS committed to assess the leaktightness of the drywell at least once each operating cycle.

The assessment is actually performed every quarter by running the drywell purge compressors to pressurize the drywell. The drywell purge compressors are part of an engineered safety system which forces air from the primary containment into the drywell. The compressors are required to be operated for at least 15 minutes every quarter and an assessment is performed in conjunction with these surveillances. There are two compressors, each of which can provide approximately 1000 scfm. The assessment considers whether a compressor is capable of increasing the pressure in the drywell. The Staff concluded in the Safety Evaluation that the proposed method provided reasonable assurance the TS value of drywell bypass leakage would not be exceeded. This regular monitoring of drywell leakage helps to ensure that there is no significant undetected degradation of the drywell.

ASME Required Containment Inspection Program

9.0 Containment Inspections

9.1 Appendix J Visual Inspections

The 10 CFR 50, Appendix J Program requires visual inspections to be performed for accessible interior and exterior surfaces of the containment system for structural problem that may affect either the containment structural leakage integrity or that might affect the performance of the ILRT. These examinations are currently required to be completed before the ILRT and during two other refueling outages before the next ILRT based on a 10 year frequency. These requirements will not be changed by this amendment.

9.2 Containment Inservice Inspections

Containment 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. Subsection IWL provides the rules and requirements for in-service inspection of Class CC containment structures. Furthermore, NRC regulation 10 CFR 50.55a(b)(2)(ix)(E) requires licensees to conduct a general visual inspection of the containment in accordance with ASME XI during each of the three inspection periods during the 10-year interval. 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 Containment Inservice Inspection (CII) program at GGNS is described in detail in CEP-CII-005, "Grand Gulf Nuclear Station Containment Inservice Inspection (CII) Program Plan." This plan was developed in accordance with the requirements of ASME Section XI, Subsections IWE and IWL, 1992 edition with 1992 addenda as modified by 10 CFR 50.55a. The program requirements include a general visual examination of the containment liner each inspection period (each ten year interval is divided into three inspection periods of three to four years). The general visual examinations of the containment liner are conducted in accordance with CEP-CII-003, "General Visual Examination of Class MC Components." The program requires general visual examination of the concrete surfaces every 5 years (plus or minus one year) in accordance with the IWL requirements. Examinations conducted to satisfy the IWL requirements are conducted in accordance with CEP-CII-004, General and Detailed Visual Examination of Concrete Containments." Any indications exceeding the screening criteria contained in CEP-CII-003 or CEP-CII-004 are provided to a qualified 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-003 and CEP-CII-004 also provide the qualification requirements for personnel conducting general visual examinations. The program currently requires VT examinations of bolted connections as detailed in CEP-CII-005.

9.3 Augmented Examinations

The GGNS CII program currently requires augmented examinations in accordance with IWE-1240 for five areas as follows:

EC-01 is a 2' x 2' area of the containment liner located directly below containment penetration #38. This area was discovered on 4/21/1998 and reported on condition report CR-GGN-1998-1235 during a preliminary walk-down of the containment. The liner in this area was found to be "heavily corroded" and covered with a whitish deposit which appeared to have leached from the chill water supply piping insulation. Removal of the deposit confirmed that some loss of the liner base metal had occurred. Engineering evaluation determined that the area continued to perform its design function. The coating in this area had been damaged and was repaired. Subsequent VT-1 and UT examination of the area occurred in 2001 and is documented in QIPN 0166-000-2001 and NDEN 0165-001-2001. These examinations showed no additional corrosion of the area and confirmed that the coating remained intact. The area was accepted by examination in accordance with the provisions of IWE-3122.1. The area remains an augmented inspection area due to the potential for wetting from condensation on the chilled water supply line running through penetration #38.

EC-02 covers all the class MC components on the auxiliary building side of penetration #38. This area was discovered during the initial IWE examinations on 3/20/2001 and reported on condition report CR-GGN-2001-0467. Rust streaks were found coming from the insulation surrounding the chilled water penetration. The insulation was removed and the exposed surfaces were examined. UT examinations showed that there was no material loss (wall thinning) of the associated liner or piping materials affected and the areas were accepted by examination in accordance with the provisions of IWE-3122.1. These examinations are documented in QIPN 0370-000-2001 and NDEN 0371-001-2001. The area was added as an area requiring augmented examination due to the potential for accelerated corrosion because of condensation on the chilled water supply line running through penetration #38.

Areas EC-03, EC-04 and EC-05 indicate three separate places where rust streaking was observed coming from behind expansion foam placed between the deck at elevation 135'4" and the containment liner. These areas were reported in CR-GGN-2001-0120. In each case the foam was removed and the area examined using VT-1 and UT techniques. The initially inaccessible areas were accepted by examination in accordance with the provisions of IWE-3122.1. This examination and acceptance is documented on QIPN 0520-000-2001 with supplementary UT data collected and reported on NDEN 0521-001-2001. The areas covered in EC-03 through EC-05 may be subjected to accelerated corrosion due to the potential for these areas to become wetted. As a result these areas are treated as augmented inspection areas.

9.4 Examination Categories E-D and E-G

The NRC issued relief authorization for alternatives to the requirements of ASME Section XI, as endorsed by 10 CFR 50.55a 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 10 CFR 50, 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.

9.5 Uninspectable Surfaces

The NRC has previously expressed concerns that some degradations cannot be detected visually (i.e., VT-1 or VT-3) unless they are through the thickness of the shell or liner. There are inaccessible areas of the GGNS containment, including parts of the inner and outer surfaces covered or blocked by concrete. The overall inner surface area of the containment is approximately 92,000 square feet. Approximately 24,000 square feet, or 26.5%, is covered in concrete or submerged. There are no programs that monitor the condition of the inaccessible areas of the containment plate directly. When there is an indication of potential degradation of inaccessible areas of the containment plate, this finding is evaluated and appropriate actions are taken to assure the adequacy and integrity of the containment. CR-GGN-2001-0120 and CR-GGN-2001-0309 document cases where indications of potential problems within inaccessible areas where noted. In both cases, foam expansion material was removed to gain access to the areas in question for direct examination. In both cases the initially suspect areas contained light corrosion that was within the acceptance standards for the containment. The areas were ultimately accepted by examination.

Portions of the GGNS liner are submerged in the suppression pool. The submerged surfaces are accessible and are examined at the end of the Containment Inservice Inspection interval in accordance with the ASME requirements. Please note that the submerged portions of the liner are stainless steel.

The potential for leakage under high pressure, during core damage accidents is explicitly included in the risk analyses. 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 Classes 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 analyses demonstrate that even with the increased potential to have an undetected containment flaw or leak path, the increase in risk is insignificant.

9.6 Screening Criteria

CEP-CII-005 is the controlling document for the overall containment inspection program and references other procedures as necessary to control specific examinations. The acceptance criteria for examinations conducted at Grand Gulf Nuclear Station is provided in Appendix E of CEP-CII-003 and repeated below:

9.6.1 Uncoated Surface Areas

If any of the conditions listed below are present, the condition must be recorded on the General Visual Examination Report and forwarded to the RE for acceptance review:

- Cracking in the base metal.
- Discoloration in the following categories:
  - Visible rust streaks or runs when the source is inaccessible for examination.
  - Significant discoloration of unknown origin.
  - Discoloration of known origin when the origin could have significant impact on the structural integrity or leak tightness of the containment vessel.
- Excessive wear which results discernable thinning of the base metal.
- Pits, dents, or gouges (excluding fabrication marks) of the base metal exceeding the acceptable values for a given region (provided in Table E-1 of CEP-CII-003 and calculated in C-G-1200.0 Supplement 1 Rev 0)
- Excessive corrosion (defined in Section 3 of CEP-CII-003).
- Discernable bulges
- Other conditions causing discernable degradation of the base metal.

9.6.2 Coated Surface Areas

If any of the conditions listed below are present, the condition must be recorded on the examination form and form forwarded to the RE for acceptance review:

- Any of the conditions listed for uncoated surfaces,
- Uncoated surfaces when the surface is required to be coated.
- Blisters greater than size No. 6 as specified in ASTM D 714 (Annual Book of ASTM Standard, Part 27).
- Checking greater than standard No. 2 as specified in ASTM D 660 (Annual Book of ASTM Standards, Part 27),
- Cracking greater than standard No. 6 as specified in ASTM D 661 (Annual Book of ASTM Standards, Part 27),
- Flaking greater than standard No. 6 as specified in ASTM D 772 (Annual Book of ASTM Standards, Part 27),
- Rusting equal to or greater than Grade 7 as specified in ASTM D 610 (Annual Book of ASTM Standards, Part 27),
- Excessive Wear defined as wear which results in removal of the coating material to expose bare metal.
- Other distress to the coating that may indicate degradation of the base metal.

While examinations have identified initially suspected areas, all identified areas were determined to be within the acceptance criteria and acceptable as is.

9.7 Information Notice 92-20

Information Notice (IN) 92-20 "Inadequate Local Leak Rate Testing," discussed the inadequate local leak rate testing of two-ply stainless steel bellows. GGNS has only one bellows that could be subject to the failure mechanism described in the IN. This an expansion bellows associated with the horizontal fuel transfer tube. GGNS conducted several tests to verify the adequacy of the local leak rate testing for this bellows.

- The bellows have been tested locally every refueling outage until the bellows were placed on an extended test frequency (currently 5 years). The acceptance criteria are very low for this penetration (50 sccm) and the tests have always demonstrated zero leakage.
- During refueling outage 5 (1992), a visual inspection of the exterior surface of the bellows was done while under LLRT test pressure of 11.5 psig. No indications were found of cracks or gouges and the bellows was described as being in good condition.
- Tests were done to verify that air could pass through each of the bellows halves from one test connection to the other and that there were no obstructions to the flow.
- During refueling outage 6 (1993), tests were done to confirm that the bellows annulus is vented to the containment atmosphere. This ensured that the annulus was being subjected to ILRT test pressure (about 12 psig). This was the fourth ILRT with all results being well below the acceptance limits. In addition, a visual inspection using liquid leak detection fluid was done of the exterior of the bellows while attempting to pressurize the bellows with air.

All of this testing provides a high degree of confidence that the test methods currently being used are adequate to detect leakage across the bellows assembly. It is also worthwhile to note that the bellows are not subjected to large or rapid temperature changes or other operationally induced stresses.

10.0 REGULATORY ANALYSIS

10.1 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 ILRT of the containment are set forth in 10 CFR 50.54(o) and 10 CFR 50, Appendix J. Both of these sections address criteria established in 10 CFR 50 Appendix A in General Design Criteria (GDC) 50, 51, 52, and 53. A discussion of the GGNS conformance with these GDC is provided in the Updated Final Safety Analysis Report (UFSAR) Chapter 3.1. Entergy has determined that the proposed change does not require any additional exemptions or relief from regulatory requirements and does not affect conformance with any GDC as described in the UFSAR. This change does involve a relaxation, on a one-time basis, to the GGNS previous exemption to 10 CFR 50, Section III.D.1(a) of Appendix J.

The requirement to perform a drywell bypass leakage rate test is derived from 10 CFR 50.36.

10 CFR 50.36(c)(3) "Surveillance requirements," requires the inclusion in the TS, "tests, calibrations or inspections to assure that the necessary quality of systems and components is maintained, that facility operation will be with safety limits, and that the limiting conditions for operation will be met."

10 CFR 50.36(c)(5), "Administrative controls," requires that "provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner" will be included in the TS. The Appendix J Testing Program is included in this section. 10 CFR 50, Appendix J, Option B, Section V.B, "Implementation" requires that the implementation document used to develop a performance-based leakage testing program be included by general reference in the TS.

As the proposed change is for test interval extensions, Entergy is justifying the request on a risk-informed basis in accordance with Regulatory Guide (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 RG 1.174 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).

Entergy has determined that the proposed changes do not require any exemptions or relief from regulatory requirements, other than the TS, and do not affect conformance with any GDC differently than described in the SAR.

10.2 <u>No Significant Hazards Consideration</u>

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 10 CFR 50.92, "Issuance of amendment," as discussed below:

Entergy Operations, Inc. is proposing to revise the Grand Gulf Nuclear Station (GGNS) Administrative Technical Specifications regarding containment leak rate testing. The proposed change will revise the improved GGNS Administrative Technical Specification 5.5.12 regarding Containment Integrated Leak Rate Testing (ILRT) and Technical Specification (TS) 3.6.5.1.1 regarding drywell bypass leakage testing (DWBT). The change would allow for an extended interval for performance of the next ILRT and the drywell bypass leakage test. 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 amendments by focusing on the three standards set forth in 10 CFR 50.92, "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.

   The proposed amendment to TS 5.5.12 adds a one-time extension to the current interval for Type A testing (i.e., the ILRT) and the DWBT. 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 GGNS is consistent with these results. In addition, 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 (10C FR 50.65) and by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code are performed to identify containment degradation that could affect leak tightness.

   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 tests are not being modified, but are only being 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. The evaluations done in support of this change confirm that. Further, the extended test interval would have a minimal effect on this risk since Type B and C testing detects 97% of potential leakage paths. For the requested change in the GGNS ILRT/DWBT interval, it was determined that the risk contribution of leakage will increase 0.99%. 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.

10.3 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.

10.0 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
River Bend	131	March 5, 2003	ML030650187

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

Attachment 2

GNRO-2003/00029

Proposed Technical Specification Changes (mark-up)

5.5 Programs and Manuals (continued)

5.5.11 <u>Technical Specifications (TS) Bases Control Program</u>

This program provides a means for processing changes to the Bases of these Technical Specifications.

a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.

b. Licensees may make changes to Bases without prior NRC approval provided the changes do not involve either of the following:

   1. A change in the TS incorporated in the license; or

   2. A change to the UFSAR or Bases that involves an unreviewed safety question as defined in 10 CFR 50.59.

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

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 <u>10 CFR 50, Appendix J, Testing Program</u>

This program establishes the leakage rate testing program 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 implemented in accordance with the Safety Evaluation issued by the Office of Nuclear Reactor Regulation dated April 26, 1995 (GNRI-95/00087) as modified by the Safety Evaluation issued for Amendment No. 135 to the Operating License. Consistent with standard scheduling practices for Technical Specifications required surviellances, intervals for the recommended surveillance frequency for Type A, B and C testing may be extended by up to 25 percent of the test interval, not to exceed 15 months. Insert A

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.5.1.1	Verify bypass leakage is less than or equal to the bypass leakage limit. However, during the first unit startup following drywell bypass leak rate testing performed in accordance with this SR, the acceptance criterion is leakage ≤ 10% of the bypass leakage limit. Insert B	24 months following 2 consecutive tests with bypass leakage greater than the bypass leakage limit until 2 consecutive tests are less than or equal to the bypass leakage limit AND 48 months following a test with bypass leakage greater than the bypass leakage limit AND ------NOTE----- SR 3.0.2 is not applicable for extensions > 12 months. --------------- 120 months
SR 3.6.5.1.2	Visually inspect the exposed accessible interior and exterior surfaces of the drywell.	Once prior to performance of each Type A test required by SR 3.6.1.1.1
SR 3.6.5.1.3	Verify drywell air lock leakage by performing an air lock barrel leakage tests at ≥ 3 psid.	24 months

Insert A

, except that the next Type A test performed after the November 24, 1993 Type A test shall be performed no later than November 23, 2008.

Insert B

, except that the next drywell bypass leak rate test performed after the November 24, 1993 test shall be performed no later than November 23, 2008

Attachment 3

GNRO-2003/00029

Changes to Technical Specification Bases Pages (for Information)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1.1 (continued)

This frequency is modified on a one-time basis until November 23, 2008.

the safety analysis. This Surveillance is performed at least once every 10 years on a performance based frequency. The Frequency is consistent with the difficulty of performing the test, risk of high radiation exposure, and the remote possibility that sufficient component failures will occur such that the drywell bypass leakage limit will be exceeded. If during the performance of this required Surveillance the drywell bypass leakage rate is greater than the drywell bypass leakage limit the Surveillance Frequency is increased to every 48 months. If during the performance of the subsequent consecutive Surveillance the drywell bypass leakage rate is less than or equal to the drywell bypass leakage limit the 10 year Frequency may be resumed. If during the performance of two consecutive Surveillances the drywell bypass leakage is greater than the drywell bypass leakage limit the Surveillance Frequency is increased to at least once every 24 months. The 24 months Frequency is maintained until during the performance of two consecutive surveillances the drywell bypass leakage rate is less than or equal to the drywell bypass leakage limit, at which time the 10 year Frequency may be resumed. For two Surveillances to be considered consecutive the Surveillances must be performed at least 12 months apart.

Since the Frequency is performance based, the Frequency was concluded to be acceptable from a reliability standpoint (Ref. 3).

SR 3.6.5.1.2

The exposed accessible drywell interior and exterior surfaces are inspected to ensure there are no apparent physical defects that would prevent the drywell from performing its intended function. This SR ensures that drywell structural integrity is maintained. The Frequency was chosen so that the interior and exterior surfaces of the drywell can be inspected in conjunction with the inspections of the primary containment required by 10 CFR 50, Appendix J (Ref. 2). Due to the passive nature of the drywell structure, the specified Frequency is sufficient to identify

(continued)