Florida Power
Progress Energy

Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 50.90

June 20, 2001
3F0601-06

50-302

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

Subject: Crystal River - Unit 3 – License Amendment Request #267, Revision 2, Supplemental Risk-Informed Information in Support of License Amendment Request #267

References:

1. FPC to NRC letter, 3F0401-11, dated April 25, 2001, License Amendment Request #267, Revision 1, Supplemental Risk-Informed Information in Support of License Amendment Request #267, Revision 0

2. FPC to NRC letter, 3F0301-05, dated March 7, 2001, License Amendment Request #267, Revision 0, Revision to Improved Technical Specification 5.6.2.20, "Containment Leakage Rate Testing Program"

3. 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, Option B

Dear Sir:

Florida Power Corporation (FPC) hereby submits License Amendment Request (LAR) # 267, Revision 2, supplemental risk-informed information in support of References 1 and 2, to allow a one-time interval extension for the Crystal River – Unit 3 (CR-3) Type A, Integrated Leakage Rate Test (ILRT) for no more than five (5) years. This risk-informed information includes the change in the Large Early Release Frequency (LERF) and the predicted person-rem/year associated with the time interval extension for ILRT performance.

FPC requests NRC approval of LAR #267 by July 31, 2001, with 30 days for implementation. The requested approval date and implementation period will allow sufficient time to reschedule the remaining outage activities to achieve optimum effectiveness of Refueling Outage 12, scheduled to begin on September 29, 2001.

Attachment A is FPC Calculation F-01-0001, Evaluation of Risk Significance of ILRT Extension, Revision 2. The conclusion of the FPC Calculation is that the increase in the Type A test interval would result in a net increase in LERF that is less than the value defining risk significance. The net change in population dose results in an increase of about 0.045%. This increased population dose is also considered not to be risk significant.

A001

As stated in Attachment A, the evaluation for CR-3 is consistent with a similar assessment performed for the Indian Point 3 (IP3) plant, which was approved by the NRC. The CR-3 assessment utilizes:

the guidelines set forth in NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J, July 26, 1995," Revision 0;

the methodology used in EPRI TR-104285, "Risk Assessment of Revised Containment Leak Rate Testing Intervals" August 1994; and

the regulatory guidance on the use of Probabilistic Risk Assessment (PRA) findings in support of a licensee request to a plant's licensing basis, RG 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis," July 1998.

Attachment A also utilizes information presented in Reference 1, Attachment C (Generic Level 3 PRA for Crystal River 3, B&W Owners Group Risk-Informed Applications Committee, BAW-2369, May 2000) and Crystal River Unit 3 Individual Plant Examination, Revision 0, (FPC to NRC letter, 3F0393-03, dated March 9, 1993).

Attachments B and C are proposed and revised Improved Technical Specifications change pages in strikeout / shadowed and in revision bar format, respectively. The format of these pages conforms to NUREG-1430, Standard Technical Specifications for Babcock & Wilcox Plants, Draft Revision 2, April 2001, and to Industry / TSTF Standard Technical Specification Change Traveler - 52 (TSTF-52), Revision 3 for 10 CFR 50, Appendix J, Option B, Containment Leakage Rate Testing Program.

CR-3 has determined that this risk-informed information does not change the conclusion in the Environmental Impact Evaluation and does not change the conclusions reached in the No Significant Hazards Consideration Determination submitted by Reference 2.

The CR-3 Plant Nuclear Safety Committee has reviewed this request and recommended it for approval.

This letter establishes no new regulatory commitments.

The NRC has approved a similar risk-informed submittal relating to a one-time extension of a Type A test interval for Entergy's Indian Point 3 (IP3) nuclear power plant. The IP3 request was submitted on September 6, 2000 (IPN-00-062) and supplemented on January 18, 2001 (IPN-01-007) and on April 2, 2001 (IPN-01-030). The NRC approval was granted on April 17, 2001 (TAC No. MB0178).

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Supervisor, Licensing and Regulatory Programs at (352) 563-4883.

Sincerely,

Dale E. Young

Dale E. Young
Vice President, Crystal River Nuclear Plant

DEY/rmb

Attachments:

A. FPC Calculation F-01-0001, Revision 2, Evaluation of Risk Significance of ILRT Extension
B. Proposed Revised Improved Technical Specifications Change Pages - Strikeout / Shadowed Format
C. Proposed Revised Improved Technical Specifications Change Pages - Revision Bar Format

xc: NRR Project Manager
Regional Administrator, Region II
Senior Resident Inspector

STATE OF FLORIDA

COUNTY OF CITRUS

Dale E. Young states that he is the Vice President, Crystal River Nuclear Plant for Progress Energy; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

Dale E Young

Dale E. Young
Vice President
Crystal River Nuclear Plant

The foregoing document was acknowledged before me this 26th day of June, 2001, by Dale E. Young.

Charlene Miller

Signature of Notary Public
State of Florida

Charlene Miller
Commission # CC 979312
Expires Nov. 4, 2004
Bonded Thru
Atlantic Bonding Co., Inc.

(Print, type, or stamp Commissioned
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FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT - 3

DOCKET NUMBER 50-302 / LICENSE NUMBER DPR-72

ATTACHMENT A

LICENSE AMENDMENT REQUEST #267, REVISION 2
Containment Leakage Rate Testing Program

FPC Calculation F-01-0001, Revision 2
Evaluation of Risk Significance of ILRT Extension

Florida Power CORPORATION

ANALYSIS/CALCULATION

Crystal River Unit 3

A-C.FRM

DOCUMENT NUMBER

F-01-0001, Rev.2

PROJECT

Evaluation of Risk Significance of ILRT Extension

I. PURPOSE

The purpose of this calculation is to evaluate the risk of extending the Type A Integrated Leak Rate Test (ILRT) interval beyond the current 10 years required by 10 CFR 50, Appendix J [1] at Crystal River Unit 3 (CR3). The results may be used to support license amendment request LAR-267.

The evaluation for CR3 is consistent with a similar assessment performed for the Indian Point 3 (IP3) plant, which was approved by the NRC [2,3]. This assessment utilizes the guidelines set forth in NEI 94-01 [4], the methodology used in EPRI TR-104285 [5] and the regulatory guidance on the use of Probabilistic Risk Assessment (PRA) findings in support of a licensee request to a plant's licensing basis, RG 1.174 [6].

This calculation evaluates the risk associated with various ILRT intervals as follows:

- 3 years - Interval based on the original requirements of 3 tests per 10 years.
- 10 years - This is the current test interval required for CR3.
- 15 years - This is the interval extension approved for Indian Point 3.
- 16 years - This interval equates to an extension of 3 fuel cycles at CR3.

The risks are based on the information presented in the CR3 Individual Plant Examination [7] and a Level 3 PRA study performed by the B&W Owners Group for CR3 [8].

DESIGN ENGINEER	DATE	VERIFICATION ENGINEER	DATE	SUPERVISOR, NUCLEAR ENGINEERING	DATE
D.N. Miskiewicz	6/19/01	Andrew Howe	6-19-01	[signature]	6/19/01

Rev 6/95

RET: Life of Plant SESP: Nuclear Engineering

F-01-0001, Rev.2

II. RESULTS/CONCLUSIONS

The specific results are summarized in Table 13 below. The Type A contribution to LERF is defined as the contribution from Class 3b.

Table 13
Summary of Risk Impact on Extending Type A ILRT Test Frequency

	Risk Impact for 3-years (baseline)	Risk Impact for 10-years (current requirement)	Risk Impact for 15-years	Risk Impact for 16-years (3 fuel cycles for CR3)
Total Integrated Risk (Person-Rem/yr)	2.0027	2.0045	2.0054	2.0055
Type A Testing Risk (Person-Rem/yr)	0.0187	0.0206	0.0216	0.0217
% Total Risk (Type A / Total)	0.93%	1.03%	1.08%	1.08%
Type A LERF (Class 3b) (per year)	2.90E-07	3.19E-07	3.34E-07	3.36E-07
Changes due to extension from 10 years (current)				
Δ Risk from current (Person-rem/yr)			0.0009	0.0010
% Increase from current (Δ Risk / Total Risk)			0.045%	0.050%
Δ LERF from current (per year)			1.50E-08	1.70E-08
Δ CCFP from current			0.15%	0.15%
Changes due to extension from 3 years (baseline)				
Δ Risk from baseline (Person-rem/yr)			0.0027	0.0028
% Increase from baseline (Δ Risk / Total Risk)			0.135%	0.140%
Δ LERF from baseline (per year)			4.40E-08	4.60E-08
Δ CCFP from baseline			0.31%	0.31%

Based on the data:

1. The person-rem/year increase in risk contribution from extending the ILRT test frequency from the current once-per-ten-year interval to once-per-fifteen years is 0.0009 person-rem/yr.

2. The total integrated increase in risk contribution from extending the ILRT test frequency from the current once-per-10-year interval to once-per-15 years is 0.045%.

3. The risk increase in LERF from extending the ILRT test frequency from the current once-per-10-year interval to once-per-15 years is 1.5 x 10^{-8}/yr.

4. The change in CCFP from the current once-per-10-year interval to once-per-15 years is 0.15%

Based on the above results, the following are conclusions regarding the assessment of the plant risk associated with extending the Type A ILRT test frequency from ten-years to fifteen years.

1. The change in Type A test frequency from once-per-ten-years to once-per-fifteen-years increases the risk impact on the total integrated plant risk by only 0.045%. Also, the change in Type A test frequency from the original three-per-ten-years to once-per-fifteen-years increases the risk only 0.135%. Therefore, the risk impact when compared to other severe accident risks is negligible.

2. Reg. Guide 1.174 provides guidance for determining the risk impact of plant-specific changes to the licensing basis. Reg. Guide 1.174 defines very small changes in risk as resulting in increases of CDF below 10^{-6}/yr and increases in LERF below 10^{-7}/yr. Since the ILRT does not impact CDF, the relevant criterion is LERF. The increase in LERF resulting from a change in the Type A ILRT test interval from an once-per-ten-years to an once per-fifteen-years is 1.5x10^{-8}/yr. Since guidance in Reg. Guide 1.174 defines very small changes in LERF as below 10^{-7}/yr, increasing the ILRT interval from 10 to 15 years is therefore considered non-risk significant. In addition, the change in LERF resulting from a change in the Type A ILRT test interval from a three-per-ten-years to an once per-fifteen-years is 4.4x10^{-8}/yr, is also non-risk significant.

3. R.G. 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 defense-in-depth philosophy is maintained by demonstrating that the balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation. The change in conditional containment failure probability was estimated to be 0.15% for the proposed change and 0.31% for the cumulative change of going from a test interval of 3 in 10 years to 1 in 15 years. These changes are small and demonstrate that the defense-in-depth philosophy is maintained.

III. DESIGN INPUTS

The CR3 PRA is a non-safety related tool and is intended to provide "best estimate" results which can be used as input when making risk informed decisions. The IPE was an NRC submittal of the PRA provided in response to requests from Generic Letter 88-20. Neither the PRA nor the IPE are considered as design basis information.

The inputs for this calculation come from the information documented in the CR3 IPE [7] and a Level 3 PRA study performed by the B&W Owners Group for CR3 [8]. The Level 3 study regrouped the CR3 IPE release categories based on a generic template adopted by the Owners group, and used the MACCS2 computer code to develop Person-Rem dose results. The study also used site specific inputs for meteorological and population data. The results are summarized in the following Table 1.

Table 1
Level 3 PRA Person-Rem Estimates By Release Category

Release Category ID	Description	Person-Rem
RC101	Containment Bypass	202000
RC102		202000
RC103		202000
RC501	Early containment failure due to phenomena	577000
RC502		657000
RC503		658000
RC504		657000
RC505		658000
RC506	Early containment failure due to isolation failure and phenomena	657000
RC507		658000
RC601	Late containment failure due to phenomena	37900
RC602		197000
RC603		197000
RC801	Late containment failure due to phenomena	1210
RC802		1210
RC901	Intact containment	748
RC902		987

Because the above results were produced as a study, CR3 performed an additional Engineering Evaluation (EE)[9] to benchmark the results against the source term from the Design Basis Accident (DBA) LOCA. The EE estimated a 50 mile dose of 683 person-rem compared to the 987 person-rem given in the Level 3 study. The conclusion of the EE was that the Level 3 study results are reasonable and acceptable to use for this calculation.

For comparison, the IP3 analysis [3] assumed the doses were a function of the DBA LOCA leakage (La) using the following factors:

Table 2
Indian Point Assumed Dose Factors [3]

Class	Dose Factor
1	1 La
2	35 La
3a	10 La
3b	35 La
4	0
5	0
6	35 La
7	100 La

Key Plant Damage States (KPDS) fractions from the IPE were also used to develop release category frequencies. These frequencies are directly dependent on the KPDS frequencies. Because the Level 3 PRA study used a later set of Initiating Event (IE) data, these frequencies have been adjusted to be consistent with the IPE (KPDS) results. The KPDS frequencies are listed in Table 3 and are applied to the release category frequencies using the equation below. The results are given in Table 4.

$$f_{RCxxx} \mid KPDS(i) = f_{RCxxx(i)} \circledast \frac{f_{KPDS(i)}(\text{Ref } 8)}{f_{KDPS(i)}(IPE)}$$

Where: fRCxxx|KPDS(i) is the rebaselined release category frequency for the analysis, fRCxxx(i) is the frequency contribution to release category RCxxx as stated in Reference 8 attributed to KPDS(i), fKPDS(i) is the frequency of KPDS(i) from either Reference 8 or the CR3 IPE.

Table 3
CR3 Key Plant Damage States Frequencies

Key Plant Damage State	Ref 8 Frequency (/yr)	IPE Frequency (/yr)
K3BA	1.16E-06	1.78E-06
K4K	8.89E-07	6.69E-07
K6BA	5.54E-06	7.93E-06
K7D	6.47E-07	3.35E-06
K7JH	1.21E-08	9.24E-08
Total (CDF)	8.24E-06	1.38E-05

Table 4
Release Category Frequencies Based on IPE Results

	K3BA	K4K	K6BA	K7D	K7JH	Total
RC101		6.62E-07				6.62E-07
RC102						0.00E+00
RC103		7.36E-09				7.36E-09
RC501						0.00E+00
RC502	5.34E-09					5.34E-09
RC503			5.55E-08			5.55E-08
RC504	7.12E-09		7.93E-09			1.51E-08
RC505			7.93E-08			7.93E-08
RC506	1.42E-08		7.93E-09			2.22E-08
RC507			7.93E-09	2.18E-07		2.26E-07
RC506*					4.62E-09	4.62E-09
RC507*					8.78E-08	8.78E-08
RC601	4.63E-08		7.77E-07			8.23E-07
RC602	2.49E-08		5.63E-07			5.88E-07
RC603	1.48E-07		1.67E-07	3.13E-06		3.45E-06
RC801	2.56E-07		1.85E-06			2.10E-06
RC802	8.95E-07		8.01E-07			1.70E-06
RC901						0.00E+00
RC902	3.83E-07		3.62E-06			4.00E-06
Total	1.78E-06	6.69E-07	7.93E-06	3.35E-06	9.24E-08	1.38E-05

Other inputs to this calculation include ILRT test data from NUREG-1493 [10] and the EPRI report [5] and are referenced in the body of the calculation.

IV. <u>ASSUMPTIONS</u>

1. The maximum containment leakage for Class 1 sequences is 1 L_a because a new Class 3 has been added to account for increased leakage due to Type A inspections.

2. The maximum containment leakage for Class 3a sequences is 10 L_a based on the previously approved methodology [2,3].

3. The maximum containment leakage for Class 3b sequences is 35 L_a based on the previously approved methodology [2,3].

4. Class 3b is conservatively categorized LERF based on the previously approved methodology [2,3]

5. Containment leakage due to Classes 4 and 5 are considered negligible based on the previously approved methodology [2,3].

6. The containment releases are not impacted with time.

7. The containment releases for Classes 2, 6, 7 and 8 are not impacted by the ILRT Type A Test frequency. These classes already include containment failure with release consequences equal or greater than those impacted by Type A.

8. Because Class 8 sequences are containment bypass sequences, potential releases are directly to the environment. Therefore, the containment structure will not impact the release magnitude.

V. REFERENCES

1. Title 10, Code of Federal Regulations, Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors".

2. Entergy, IPN-01-007, Indian Point 3 Nuclear Power Plant, "Supplemental Information Regarding Proposed Change to Section 6.14 of the Administrative Section of the Technical Specification", January 18,2001.

3. United States Nuclear Regulatory Commission, Indian Point Nuclear Generating Unit No.3 - Issuance of Amendment Re: Frequency of Performance-Based Leakage Rate Testing (TAC NO. MB0178), April 17, 2001.

4. NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J", July 26, 1995, Revision 0

5. EPRI TR-104285, "Risk Assessment of Revised Containment Leak Rate Testing Intervals" August 1994.

6. Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis" July 1998.

7. Crystal River Unit 3 Individual Plant Examination, Revision 0, Florida Power Corporation, March 1993.

8. BAW-2369, B&W Owners Group Risk-Informed Applications Committee, "Generic Level 3 PRA for Crystal River Unit 3", May 2000.

9. CR3 Engineering Evaluation, EEF-01-003, "Level 3 PRA Check - Containment Leakage", Revision 0, April 10, 2001.

10. NUREG-1493, "Performance-Based Containment Leak-Test Program", July 1995.

VI. CALCULATIONS

This calculation applies the IPE key plant damage states and the Level 3 PRA person-rem estimates in order to estimate the changes in risk due to increasing the ILRT test interval. The changes in risk are assessed consistent with the previously approved methodology used by Indian Point 3 [2,3]. This approach is similar to that presented in EPRI TR-104285 [5] and NUREG-1493 [10]. Namely, the analysis performed examined CR3's IPE [7] plant specific results in which the containment integrity remains intact or the containment is impaired.

The basic analysis steps are listed below:

1. Map the Level 3 release categories into the 8 release classes defined by the EPRI Report [5]

2. Calculate the Type A leakage estimate to define the analysis baseline

3. Calculate the Type A leakage estimate to address the current inspection frequency

4. Modify the Type A leakage estimates to address extension of the Type A test interval

5. Calculate increase in risk due to extending Type A inspection intervals

6. Estimate the change in LERF due to the Type A testing.

7. Estimate the change in conditional containment failure probability due to the Type A testing.

Step 1: Map the Level 3 release categories into the 8 release classes defined by the EPRI Report [5]

EPRI Report TR-104285 defines eight(8) release classes as follows:

Table 5
EPRI Containment Failure Classifications

Class 1	Containment remains intact including accident sequences that do not lead to containment failure in the long term. The release of fission products (and attendant consequences) is determined by the maximum allowable leakage rate values La, under Appendix J for that plant. The allowable leakage rates (La), are typically 0.1 weight percent of containment volume per day for PWRs and 0.5 weight percent per day for BWRs (all measured at Pac, calculated peak containment pressure related to the design basis accident). Changes to leak rate testing frequencies do not affect this classification.
Class 2	Containment isolation failures (as reported in the IPEs) include those accidents in which the pre-existing leakage is due to failure to isolate the containment. These include those that are dependent on the core damage accident in progress (e.g., initiated by common cause failure or support system failure of power) and random failures to close a containment path. Changes in Appendix J testing requirements do not impact these accidents.
Class 3	Independent (or random) isolation failures include those accidents in which the pre-existing isolation failure to seal (i.e., provide a leak-tight containment) is not dependent on the sequence in progress. This accident class is applicable to sequences involving ILRTs (Type A tests) and potential failures not detectable by LLRTs.
Class 4	Independent (or random) isolation failures include those accidents in which the pre-existing isolation failure to seal is not dependent on the sequence in progress. This class is similar to Class 3 isolation failures, but is applicable to sequences involving Type B tests and their potential failures. These are the Type B-tested components that have isolated but exhibit excessive leakage.
Class 5	Independent (or random) isolation failures include those accidents in which the pre-existing isolation failure to seal is not dependent on the sequence in progress. This class is similar to Class 4 isolation failures, but is applicable to sequences involving Type C tests and their potential failures.
Class 6	Containment isolation failures include those leak paths not identified by the LLRTs. The type of penetration failures considered under this class includes those covered in the plant test and maintenance requirements or verified per in service inspection and testing (ISI/IST) program. This failure to isolate is not typically identified in LLRT. Changes in Appendix J LLRT test intervals do not impact this class of accidents.
Class 7	Accidents involving containment failure induced by severe accident phenomena. Changes in Appendix J testing requirements do not impact these accidents.
Class 8	Accidents in which the containment is bypassed (either as an initial condition or induced by phenomena) are included in class 8. Changes in Appendix J testing requirements do not typically impact these accidents, particularly for PWRs.

Table 6 presents the CR3 release category mapping for these eight accident classes. Person-Rem per year is the product of the frequency and the Person-Rem.

Table 6
EPRI Classification of CR3 Release Category Data

	K3BA (per yr)	K4K (per yr)	K6BA (per yr)	K7D (per yr)	K7JH (per yr)	Total (per yr)	Person-Rem	Person-Rem per yr	EPRI Class
RC101		6.62E-07				6.62E-07	202000	1.34E-01	8
RC102						0.00E+00	202000	0.00E+00	8
RC103		7.36E-09				7.36E-09	202000	1.49E-03	8
RC501						0.00E+00	577000	0.00E+00	7
RC502	5.34E-09					5.34E-09	657000	3.51E-03	7
RC503			5.55E-08			5.55E-08	658000	3.65E-02	7
RC504	7.12E-09		7.93E-09			1.51E-08	657000	9.89E-03	7
RC505			7.93E-08			7.93E-08	658000	5.22E-02	7
RC506	1.42E-08		7.93E-09			2.22E-08	657000	1.46E-02	7
RC507			7.93E-09	2.18E-07		2.26E-07	658000	1.48E-01	7
RC506*					4.62E-09	4.62E-09	657000	3.04E-03	2
RC507*					8.78E-08	8.78E-08	658000	5.78E-02	2
RC601	4.63E-08		7.77E-07			8.23E-07	37900	3.12E-02	7
RC602	2.49E-08		5.63E-07			5.88E-07	197000	1.16E-01	7
RC603	1.48E-07		1.67E-07	3.13E-06		3.45E-06	197000	6.79E-01	7
RC801	2.56E-07		1.85E-06			2.10E-06	1210	2.55E-03	7**
RC802	8.95E-07		8.01E-07			1.70E-06	1210	2.05E-03	7**
RC901						0.00E+00	748	0.00E+00	1
RC902	3.83E-07		3.62E-06			4.00E-06	987	3.95E-03	1
Total	1.78E-06	6.69E-07	7.93E-06	3.35E-06	9.24E-08	1.38E-05		1.30E+00	

* Portion of RC5xxx which is due to isolation failures.

** The RC8xxx categories are classified as EPRI Class 7 based on the EPRI definition. Because the releases are small, this will give conservative dose results. However, this will not significantly affect the conclusions of this analysis.

Step 2: Calculate the Type A leakage estimate to define the analysis baseline (3 year test interval)

As displayed in Table 6,the CR3 IPE did not identify any release categories specifically associated with EPRI Classes 3, 4, 5, or 6. Therefore each of these classes must be evaluated for applicability to CR3.

Class 3:

Containment failures in this class are due to leaks such as liner breaches which would be only be detected by performing a Type A ILRT.

For this estimation, the question on containment isolation was modified consistent with the previously approved methodology [2,3], to include the probability of a liner breach (due to excessive leakage) at the time of core damage. Using this methodology, Class 3 is divided into two classes. These are Class 3a (small liner breach) and Class 3b (large liner breach).

To calculate the probability that a liner leak will be large (Class 3b), use was made of the data presented in NUREG-1493 [10]. One data set found in NUREG-1493 reviewed 144 ILRTs. The largest reported leak rate from those 144 tests was 21 times the allowable leakage rate (La). Since 21 La does not constitute a large release, no large releases have occurred based on the 144 ILRTs reported in NUREG-1493.

To estimate the failure probability given that no failures have occurred, a conservative estimate is obtained from the 95th percentile of the $\chi 2$ distribution. In statistical theory, the $\chi 2$ distribution can be used for statistical testing, goodness-of-fit tests. The $\chi 2$ distribution is really a family of distributions, which range in shape from that of the exponential to that of the normal distribution. Each distribution is identified by the degrees of freedom, v. For time-truncated tests (versus failure-truncated tests), an estimate of the probability of a large leak using the $\chi 2$ distribution can be calculated as $\chi 2_{95}(v = 2n+2)/2N$, where n represents the number of large leaks and N represents the number of ILRTs performed to date. With no large leaks (n = 0) in 144 events (N = 144) and $\chi 2_{95}(2) = 5.99$, the 95th percentile estimate of the probability of a large leak is calculated as 5.99/(2*144) = 0.021.

Therefore the frequency of a Class 3b failure is calculated as:

$$FREQ_{class3b} = PROB_{class3b} \times CDF = 0.021 \times 1.38E\text{-}05/yr = 2.90E\text{-}07/yr$$

To calculate the probability that a liner leak will be small (Class 3a), use was made of the data presented in NUREG-1493 [10]. The data found in NUREG-1493 states that 144 ILRTs were conducted. The data reported that 23 of 144 tests had allowable leak rates in excess of 1.0La. However, of these 23 'failures' only 4 were found by an ILRT, the others were found by Type B and C testing or errors in test alignments. Therefore, the number of failures considered for 'small releases' are 4-of-144. Similar to the Class 3b probability, the estimated failure probability for small release is found by using the $\chi 2$ distribution. The $\chi 2$ distribution is calculated by n=4 (number of small leaks) and N=144 (number of events) which yields a $\chi 2(10)$ = 18.3070. Therefore, the 95th percentile estimate of the probability of a small leak is calculated as 18.3070/(2*144) = 0.064.

Therefore the frequency of a Class 3b failure is calculated as:

$$FREQ_{class3a} = PROB_{class3a} \times CDF = 0.064 \times 1.38E\text{-}05/yr = 8.83E\text{-}07/yr$$

Note: Using the methodology discussed above is conservative compared to the typical mean estimates used for PRA analysis. The mean probability of a Class 3 failure would be the (number of failures)/(number of tests) or 4/144 = 0.03.

Class 4:

This group consists of all core damage accident accidents for which a failure-to-seal containment isolation failure of Type B test components occurs. By definition, these failures are dependent on Type B testing, and the probability will not be impacted by Type A testing. Therefore this group is not evaluated any further, consistent with the approved methodology.

Class 5:

This group consists of all core damage accident accidents for which a failure-to-seal containment isolation failure of Type C test components occurs. By definition, these failures are dependent on Type C testing, and the probability will not be impacted by Type A testing. Therefore this group is not evaluated any further, consistent with the approved methodology.

Class 6:

This group is similar to Class 2, and addresses additional failure modes not typically modeled in PRAs due to the low probability of occurrence. The low failure probabilities are based on the need for multiple failures, the presence of automatic closure signals, and control room indication. Based on the purpose of this calculation, and the fact that this failure class is not impacted by Type A testing, no further evaluation is needed. This is consistent with the EPRI guidance. However, in order to maintain consistency with the previously approved methodology (i.e.- $PROB_{class6} > 0$), a conservative screening value of 1.0E-03 will be used to evaluate this class.

$$FREQ_{class6} = (\text{screening value}) \times CDF = 1.00E\text{-}03 \times 1.38E\text{-}05/yr = 1.38E\text{-}08/yr$$

Class 1:

Although the frequency of this class is not directly impacted by Type A testing, the IPE did not model Class 3 or Class 6 type failures, and the frequency for Class 1 should be reduced by the estimated frequencies in the new Class 3a, Class 3b and Class 6 in order to preserve the total CDF. The revised Class 1 frequency is therefore:

$$FREQ_{class1} = FREQ_{IPEclass1} - (FREQ_{class3a} + FREQ_{class3b} + FREQ_{class6})$$

$$FREQ_{class1} = 4.00E\text{-}06/yr - (8.83E\text{-}07/yr + 2.90E\text{-}07/yr + 1.38E\text{-}08) = 2.81E\text{-}06/yr$$

Class 2:

The frequency of Class 2 is the sum of those release categories identified in Table 6 as Class 2.

$$FREQ_{class2} = 9.24E\text{-}08/yr$$

Class 7:

The frequency of Class 7 is the sum of those release categories identified in Table 6 as Class 7.

$$FREQ_{class7} = 9.06E\text{-}06/yr$$

Class 8:

The frequency of Class 8 is the sum of those release categories identified in Table 6 as Class 8.

$$FREQ_{class8} = 6.69E\text{-}07/yr$$

Table 7 summarizes the above information by the EPRI defined classes. This table also presents exposures using the results of the CR3 Level 3 or the IP3 assumed La factors. For the Level 3 exposures the highest exposure from any release category was used for each classification.

Table 7
Release Data Summarized by EPRI Class

Class	Description	Frequency (per year)	Person-Rem (Level 3)	Person-Rem (La factors)
1	No Containment Failure	2.81E-06	987	
2	Large Containment Isolation Failures (Failure to Close)	9.24E-08	658000	
3a*	Small Isolation Failures (Type A test)	8.83E-07		9870
3b*	Large Isolation Failures (Type A test)	2.90E-07		34545
4	Small Isolation Failures - failure-to-seal (Type B test)	NA		
5	Small Isolation Failures - failure-to-seal (Type C test)	NA		
6	Other Isolation Failures (dependent failures)	1.38E-08		34545
7	Failure Induced by Phenomena (Early and late failures)	9.06E-06	197000	
8	Containment Bypasses (SGTR)	6.69E-07	202000	
CDF	All Classes	**1.38E-05**		

Based on the above table, it can be seen that the CR3 Level 3 results do not contain specific dose results for Classes 3a, 3b, and Class 6. Therefore the dose factors for these classes from the previously approved methodology (see Table 2) will be applied for this calculation. It should also be noted that CR3 used a 4 inch failed isolation size when determining the releases for class 2.

Table 8 presents the Person-Rem frequency data determined by multiplying the frequency for each failure class by the corresponding exposure.

Table 8
Baseline Mean Consequence Measures for 3-Year test Interval - Given Accident Class

Class	Description	Frequency (per year)	Person-Rem (Level 3)	Person-Rem per year
1	No Containment Failure	2.81E-06	987	0.0028
2	Large Containment Isolation Failures (Failure to Close)	9.24E-08	658000	0.0608
3a*	Small Isolation Failures (Type A test)	8.83E-07	9870	0.0087
3b*	Large Isolation Failures (Type A test)	2.90E-07	34545	0.0100
4	Small Isolation Failures - failure-to-seal (Type B test)	NA		
5	Small Isolation Failures - failure-to-seal (Type C test)	NA		
6	Other Isolation Failures (dependent failures)	1.38E-08	34545	0.0005
7	Failure Induced by Phenomena (Early and late failures)	9.06E-06	197000	1.7848
8	Containment Bypasses (SGTR)	6.69E-07	202000	0.1351
CDF	All Classes	**1.38E-05**		**2.0027**

The percent risk contribution due to Type A testing is as follows:

$\%Risk_{BASE} = [(Class3a_{BASE} + Class3b_{BASE}) / Total_{BASE}] \times 100$

Where:

$Class3a_{BASE}$ = Class 3a person-rem/year = 0.0087 person-rem/year

$Class3b_{BASE}$ = Class 3b person-rem/year = 0.0100 person-rem/year

$Total_{BASE}$ = total person-rem year for baseline interval = 2.0027 person-rem/year

$\%Risk_{BASE}$ = [(0.0087 + 0.0100) / 2.0027] x 100 = **0.93%**

Step 3: Calculate the Type A leakage estimate to address the current inspection interval

The current surveillance testing requirements as proposed in NEI 94-01 [4] for Type A testing and allowed by 10 CFR 50, Appendix J [1] is at least once per 10 years based on an acceptable performance history (defined as two consecutive periodic Type A tests at least 24 months apart in which the calculated performance leakage was less than $1.0L_a$).

According to NUREG-1493 [10], extending the Type A ILRT interval from 3-in-10 years to 1-in-10 years will increase the average time that a leak detectable only by an ILRT goes undetected from 18 to 60 months. (The average time for undetection is calculated by multiplying the test interval by 0.5 and multiplying by 12 to convert from "years" to "months"). Since ILRTs only detect about 3% of leaks (4/144), the result for a 10-yr ILRT interval is a 10% increase in the overall probability of leakage. This value is determined by multiplying 3% and the ratio of the average time for undetection for the increased ILRT test interval (60 months) to the baseline average time for undetection of 18 months (i.e., 3 * 60/18).

Risk Impact due to 10-year Test Interval

Based on the previously approved methodology [2,3], the increased probability of not detecting excessive leakage due to Type A tests directly impacts the frequency of the Class 3 sequences. The risk contribution is determined by multiplying the Class 3 accident frequency by the increase in probability of leakage of 1.10. (Recall that for a 10-year interval there is a 10% increase on the overall probability of leakage). The results of this calculation are presented in Table 9 below.

As with the baseline case, the IPE frequency of Class 1 has been reduced by the frequency of Class 3a, 3b, and Class 6 in order to preserve total CDF.

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Table 9
Mean Consequence Measures for 10-Year test Interval - Given Accident Class

Class	Description	Frequency (per Rx-yr)	Person-Rem	Person-Rem/yr
1	No Containment Failure	2.70E-06	987	0.0027
2	Large Containment Isolation Failures (Failure to Close)	9.24E-08	658000	0.0608
3a*	Small Isolation Failures (Type A test)	9.71E-07	9870	0.0096
3b*	Large Isolation Failures (Type A test)	3.19E-07	34545	0.0110
4	Small Isolation Failures - failure-to-seal (Type B test)	NA		
5	Small Isolation Failures - failure-to-seal (Type C test)	NA		
6	Other Isolation Failures (dependent failures)	1.38E-08	34545	0.0005
7	Failure Induced by Phenomena (Early and late failures)	9.06E-06	197000	1.7848
8	Containment Bypasses (SGTR)	6.69E-07	202000	0.1351
CDF	All Classes	**1.38E-05**		**2.0045**

Using the same methods as for the baseline, and the data in Table 9 the percent risk contribution due to Type A testing is as follows:

$\%Risk_{10} = [(Class3a_{10} + Class3b_{10}) / Total_{10}] \times 100$

Where:

$Class3a_{10}$ = Class 3a person-rem/year = 0.0096 person-rem/year

$Class3b_{10}$ = Class 3b person-rem/year = 0.0110 person-rem/year

$Total_{10}$ = total person-rem year for baseline interval = 2.0045 person-rem/year

$\%Risk_{10} = [(0.0096 + 0.0110) / 2.0045] \times 100 =$ **1.03%**

The percent risk increase ($\Delta\%Risk_{10}$) due to a ten-year ILRT over the baseline case is as follows:

$\Delta\%Risk_{10} = [(Total_{10} - Total_{BASE}) / Total_{BASE}] \times 100.0$

Where:

$Total_{BASE}$ = total person-rem/year for baseline interval = 2.0027 person-rem/year

$Total_{10}$ = total person-rem/year for 10-year interval = 2.0045 person-rem/year

$\Delta\%Risk_{10} = [(2.0045 - 2.0027) / 2.0027] \times 100.0 =$ **0.090%**

Step 4: Calculate the Type A leakage estimate to address extended inspection intervals

Risk Impact due to 15-year Test Interval

If the test interval is extended to 1 in 15 years, the average time that a leak detectable only by an ILRT test goes undetected increases to 90 months (0.5 * 15 * 12). For a 15-yr-test interval, the result is a 15% increase in the overall probability of leakage (i.e., 3 * 90/18). Thus, increasing the ILRT test interval from 10 years to 15 years results in a 5% increase in the overall probability of leakage (Recall that for a 10-year interval there is a 10% increase on the overall probability of leakage).

Based on the previously approved methodology [2,3], the risk contribution for a 15-year interval is similar to the 10-year interval. The difference is in the increase in probability of leakage value. For this case the value is 15 percent or 1.15. In addition, the containment leakage used for the 10-year test interval for Class 3 is used in the 15-year interval evaluation. The results for this calculation are presented in Table 10.

As with the baseline case, the IPE frequency of Class 1 has been reduced by the frequency of Class 3a, 3b, and Class 6 in order to preserve total CDF.

Table 10
Mean Consequence Measures for 15-Year test Interval - Given Accident Class

Class	Description	Frequency (per Rx-yr)	Person-Rem	Person-Rem/yr
1	No Containment Failure	2.63E-06	987	0.0026
2	Large Containment Isolation Failures (Failure to Close)	9.24E-08	658000	0.0608
3a*	Small Isolation Failures (Type A test)	1.02E-06	9870	0.0101
3b*	Large Isolation Failures (Type A test)	3.34E-07	34545	0.0115
4	Small Isolation Failures - failure-to-seal (Type B test)	NA		
5	Small Isolation Failures - failure-to-seal (Type C test)	NA		
6	Other Isolation Failures (dependent failures)	1.38E-08	34545	0.0005
7	Failure Induced by Phenomena (Early and late failures)	9.06E-06	197000	1.7848
8	Containment Bypasses (SGTR)	6.69E-07	202000	0.1351
CDF	All Classes	**1.38E-05**		**2.0054**

Using the same methods as for the baseline, and the data in Table 10 the percent risk contribution due to Type A testing is as follows:

$\%Risk_{15} = [(Class3a_{15} + Class3b_{15}) / Total_{15}] \times 100$

Where:

$Class3a_{15}$ = Class 3a person-rem/year = 0.0101 person-rem/year

$Class3b_{15}$ = Class 3b person-rem/year = 0.0115 person-rem/year

$Total_{15}$ = total person-rem year for baseline interval = 2.0054 person-rem/year

$\%Risk_{15} = [(0.0101 + 0.0115) / 2.0054] \times 100 =$ **1.08%**

The percent risk increase ($\Delta\%Risk_{15}$) due to a fifteen-year ILRT over the baseline case is as follows:

$\Delta\%Risk_{15} = [(Total_{15} - Total_{BASE}) / Total_{BASE}] \times 100.0$

Where:

$Total_{BASE}$ = total person-rem/year for baseline interval = 2.0027 person-rem/year

$Total_{15}$ = total person-rem/year for 15-year interval = 2.0054 person-rem/year

$\Delta\%Risk_{15} = [(2.0054 - 2.0027) / 2.0027] \times 100.0 =$ **0.135%**

<u>Risk Impact due to 16-year Test Interval</u>

If the test interval is extended to 1 in 16 years, the average time that a leak detectable only by an ILRT test goes undetected increases to 96 months (0.5 * 16 * 12). For a 16-yr-test interval, the result is a 16% increase in the overall probability of leakage (i.e., 3 * 96/18). Thus, increasing the ILRT test interval from 10 years to 16 years results in a 6% increase in the overall probability of leakage (Recall that for a 10-year interval there is a 10% increase on the overall probability of leakage).

Based on the previously approved methodology [2,3], the risk contribution for a 16-year interval is also similar to the 10-year interval. The difference is in the increase in probability of leakage value. For this case the value is 16 percent or 1.16. In addition, the containment leakage used for the 10-year test interval for Class 3 is used in the 16-year interval evaluation. The results for this calculation are presented in Table 11.

As with the baseline case, the IPE frequency of Class 1 has been reduced by the frequency of Class 3a, 3b, and Class 6 in order to preserve total CDF.

Table 11
Mean Consequence Measures for 16-Year test Interval - Given Accident Class

Class	Description	Frequency (per Rx-yr)	Person-Rem	Person-Rem/yr
1	No Containment Failure	2.63E-06	987	0.0026
2	Large Containment Isolation Failures (Failure to Close)	9.24E-08	658000	0.0608
3a*	Small Isolation Failures (Type A test)	1.02E-06	9870	0.0101
3b*	Large Isolation Failures (Type A test)	3.36E-07	34545	0.0116
4	Small Isolation Failures - failure-to-seal (Type B test)	NA		
5	Small Isolation Failures - failure-to-seal (Type C test)	NA		
6	Other Isolation Failures (dependent failures)	1.38E-08	34545	0.0005
7	Failure Induced by Phenomena (Early and late failures)	9.06E-06	197000	1.7848
8	Containment Bypasses (SGTR)	6.69E-07	202000	0.1351
CDF	All Classes	**1.38E-05**		**2.0055**

Using the same methods as for the baseline, and the data in Table 11 the percent risk contribution due to Type A testing is as follows:

$\%Risk_{16} = [(Class3a_{16} + Class3b_{16}) / Total_{16}] \times 100$

Where:

$Class3a_{16}$ = Class 3a person-rem/year = 0.0101 person-rem/year

$Class3b_{16}$ = Class 3b person-rem/year = 0.0116 person-rem/year

$Total_{16}$ = total person-rem year for baseline interval = 2.0055 person-rem/year

$\%Risk_{16} = [(0.0101 + 0.0116) / 2.0055] \times 100 =$ **1.08%**

The percent risk increase ($\Delta\%Risk_{16}$) due to a sixteen-year ILRT over the baseline case is as follows:

$\Delta\%Risk_{16} = [(Total_{16} - Total_{BASE}) / Total_{BASE}] \times 100.0$

Where:

$Total_{BASE}$ = total person-rem/year for baseline interval = 2.0027 person-rem/year

$Total_{16}$ = total person-rem/year for 16-year interval = 2.0055 person-rem/year

$\Delta\%Risk_{16} = [(2.0055 - 2.0027) / 2.0027] \times 100.0 =$ **0.140%**

Step 5: Calculate increase in risk due to extending Type A inspection intervals

Extension of interval from 10 years to 15 years

Based on the previously approved methodology [2,3], the percent increase in risk (in terms of person-rem/yr) of these associated specific sequences is computed as follows.

$\%Risk_{10-15} = [(PER\text{-}REM_{15} - PER\text{-}REM_{10}) / PER\text{-}REM_{10}] \times 100$

Where:

$PER\text{-}REM_{10}$ = person-rem/year of ten years interval (for classes 1, 3a and 3b)

= 0.0233 person-rem/yr [Table 9]

$PER\text{-}REM_{15}$ = person-rem/year of fifteen years interval (for classes 1, 3a and 3b)

= 0.0242 person-rem/yr [Table 10]

$\%Risk_{10-15}$ = [(0.0242 -0.0233) / 0.0233] x 100 = **3.86%**

The percent increase on the total integrated plant risk for these accident sequences is computed as follows.

$\%Total_{10-15} = [(Total_{15} - Total_{10}) / Total_{10}] \times 100$

Where:

$Total_{10}$ = total person-rem/year for 10-year interval

= 2.0045 person-rem/year [Table 9]

$Total_{15}$ = total person-rem/year for 15-year interval

= 2.0054 person-rem/year [Table 10]

% $Total_{10-15}$ = [(2.0054 -2.0045) / 2.0045] x 100 = **0.045%**

Extension of interval from 10 years to 16 years

Based on the previously approved methodology [2,3], the percent increase in risk (in terms of person-rem/yr) of these associated specific sequences is computed as follows.

$\%Risk_{10-16} = [(PER\text{-}REM_{16} - PER\text{-}REM_{10}) / PER\text{-}REM_{10}] \times 100$

Where:

$PER\text{-}REM_{10}$ = person-rem/year of ten year interval (for classes 1, 3a and 3b)

= 0.0233 person-rem/yr [Table 9]

$PER\text{-}REM_{16}$ = person-rem/year of sixteen year interval (for classes 1, 3a and 3b)

= 0.0243 person-rem/yr [Table 11]

$\%Risk_{10-16} = [(0.0243 - 0.0233) / 0.0233] \times 100 =$ **4.29%**

The percent increase on the total integrated plant risk for these accident sequences is computed as follows.

$\%Total_{10-16} = [(Total_{16} - Total_{10}) / Total_{10}] \times 100$

Where:
$Total_{10}$ = total person-rem/year for 10-year interval

= 2.0045 person-rem/year [Table 9]

$Total_{16}$ = total person-rem/year for 16-year interval

= 2.0055 person-rem/year [Table 11]

$\% Total_{10-16} = [(2.0055 - 2.0045) / 2.0045] \times 100 =$ **0.050%**

Step 6: Calculate the change in Risk in terms of Large Early Release Frequency (LERF)

The risk impact associated with extending the ILRT interval involves the potential that a core damage event that normally would result in only a small radioactive release from containment could in fact result in a large release due to failure to detect a pre-existing leak during the relaxation period. Based on the previously approved methodology [2,3], only Class 3 sequences have the potential to result in large releases if a pre-existing leak were present. Class 1 sequences are not considered as potential large release pathways because for these sequences the containment remains intact. Therefore, the containment leak rate is expected to be small (less than 2La). A larger leak rate would imply an impaired containment, such as classes 2, 3, 6 and 7.

Late releases are excluded regardless of the size of the leak because late releases are, by definition, not a LERF event. At the same time, sequences in the CR3 IPE [7], which result in large releases, are not impacted because a LERF will occur regardless of the presence of a pre-existing leak. Therefore, the frequency of Class 3b sequences is used as the increase in LERF for CR3, and the change in LERF can be determined by the differences. The following table summarizes the results:

Table 12
Change in LERF Due to Extending Type A testing Intervals

ILRT Inspection Interval	3 Years (baseline)	10 Years	15 Years	16 years
Type A LERF (Class 3b)	2.90E-07/yr	3.19E-07/yr	3.34E-07/yr	3.36E-07/yr
ΔLERF **from 10 years**			1.50E-08/yr	1.70E-08/yr
ΔLERF **from baseline**			4.40E-08/yr	4.60E-08/yr

Reg. Guide 1.174 [6] provides guidance for determining the risk impact of plant-specific changes to the licensing basis. Reg. Guide 1.174 defines very small changes in risk as resulting in increases of core damage frequency (CDF) below 1E-6/yr and increases in LERF below 1E-7/yr. Since the ILRT does not impact CDF, the relevant metric is LERF. Calculating the increase in LERF requires determining the impact of the ILRT interval on the leakage probability.

Since guidance in Reg. Guide 1.174 defines very small changes in LERF as below 1.0E-7/yr, increasing the ILRT interval to 15 years (**1.50E-08/yr**) is non-risk significant. It should be noted that if the risk increase is measured from the original 3-in-10-year interval, the increase in LERF is **4.40E-08/yr**, which is still below the 1.0E-07/yr screening criterion in Reg.Guide 1.174.

The change in LERF for a 16 year interval using the same methodology is also non-risk significant.

Step 7: Calculate the change in Conditional Containment Failure Probability (CCFP)

The conditional containment failure probability (CCFP) is defined as the probability of containment failure given the occurrence of an accident. This probability can be expressed using the following equation:

$$CCFP = 1 - \left[\frac{f(ncf)}{CDF}\right]$$

Where f(ncf) is the frequency of those sequences which result in no containment failure (ncf). This frequency is determined by summing the Class 1 and Class 3a results, and CDF is the total frequency of all core damage sequences.

Therefore the change in CCFP for this analysis is the CCFP using the results for 15 years ($CCFP_{15}$) minus the CCFP using the results for 10 years ($CCFP_{10}$). This can be expressed by the following:

$$\Delta CCFP_{10-15} = \left[\frac{f_{Class1} + f_{Class3a}}{CDF}\right]_{15} - \left[\frac{f_{Class1} + f_{Class3a}}{CDF}\right]_{10}$$

Using the data from Table 9 and Table 10:

$$\Delta CCFP_{10-15} = \left[\frac{(2.70E-06)+(9.71E-07)}{1.38E-05}\right]_{10} - \left[\frac{(2.63E-06)+(1.02E-06)}{1.38E-05}\right]_{15}$$

$$\Delta CCFP_{10-15} = .0015 = \mathbf{0.15\%}$$

Using the data from Table 8 and Table 10 provide the change in CCFP from the baseline case:

$$\Delta CCFP_{3-15} = \left[\frac{(2.81E-06)+(8.83E-07)}{1.38E-05}\right]_{3} - \left[\frac{(2.63E-06)+(1.02E-06)}{1.38E-05}\right]_{15}$$

$$\Delta CCFP_{3-15} = .0031 = \mathbf{0.31\%}$$

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ATTACHMENT B

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Strikeout / Shadowed Format

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Shadowed Text	Indicates added text

5.6 Procedures, Programs and Manuals

5.6.2.19 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

c. The reactor vessel pressure and temperature limits, including those for heatup and cooldown rates, shall be determined so that all applicable limits (e.g., heatup limits, cooldown limits, and inservice leak and hydrostatic testing limits) of the analysis are met.

d. The PTLR, including revisions or supplements thereto, shall be provided upon issuance for each reactor vessel fluency period.

5.6.2.20 Containment Leakage Rate Testing Program

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

1. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the November 7, 1991 Type A test shall be performed no later than November 6, 2006.

The peak calculated containment internal pressure for the design basis loss of coolant accident, Pa, is 54.2 psig. The containment design pressure is 55 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.25% of primary containment air weight per day.

Leakage Rate acceptance criteria are:

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

2. Air lock testing acceptance criteria are:

   a. Overall air lock leakage range is $\leq$ 0.05 L_a when tested at $\geq$ P_a.

   b. For each door, leakage rate is $\leq$ 0.01 L_a when tested at $\geq$ 8.0 psig.

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

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

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ATTACHMENT C

LICENSE AMENDMENT REQUEST #267, REVISION 2
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5.7 Procedures, Programs and Manuals

5.6.2.19 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

e. The reactor vessel pressure and temperature limits, including those for heatup and cooldown rates, shall be determined so that all applicable limits (e.g., heatup limits, cooldown limits, and inservice leak and hydrostatic testing limits) of the analysis are met.

f. The PTLR, including revisions or supplements thereto, shall be provided upon issuance for each reactor vessel fluency period.

5.6.2.20 Containment Leakage Rate Testing Program

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

1. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the November 7, 1991 Type A test shall be performed no later than November 6, 2006.

The peak calculated containment internal pressure for the design basis loss of coolant accident, Pa, is 54.2 psig. The containment design pressure is 55 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.25% of primary containment air weight per day.

Leakage Rate acceptance criteria are:

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

2. Air lock testing acceptance criteria are:

   a. Overall air lock leakage range is $\leq 0.05\ L_a$ when tested at $\geq P_a$.

   b. For each door, leakage rate is $\leq 0.01\ L_a$ when tested at ≥ 8.0 psig.

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

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