Entergy

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Site Vice President

April 14, 2004

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

SUBJECT: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket No. 50-283
License Number. DPR-35

Request for Amendment to the Technical Specifications to provide a One-time Integrated Leak Rate Test (ILRT) Interval Extension

LETTER NUMBER: 2.04.027

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc. (Entergy) proposes to amend the Pilgrim Station Facility Operating License, DPR-35.

The proposed license amendment would revise Technical Specification section 4.7.A.2.a "Primary Containment Integrity" to allow a one-time interval extension of no more than five (5) years for the PNPS Type A, Integrated Leakage Rate Test (ILRT). The exception is to allow ILRT testing within fifteen years from the last ILRT, performed on May 25, 1995. This application represents a cost beneficial licensing change. The integrated leak rate test imposes significant expense on the station while the safety benefit of performing it within 10 years, versus 15 years, is minimal. The proposed amendment is considered risk-informed, therefore Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" has been followed, while using the methodology of Electric Power Research Institute (EPRI) Report "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals," (EPRI TR-104285).

Pilgrim has reviewed the proposed amendment in accordance with 10 CFR 50.92 and concludes it does not involve a significant hazards consideration.

There are no commitments contained in this letter.

Entergy requests approval of the proposed amendment by March 16, 2005 to support implementation during the next scheduled refueling outage in April 2005.

If you have any questions or require additional information, please contact Bryan Ford at (508) 830-8403.

A017

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 14th day of April 2004.

Sincerely,

Michael A Balduzzi

Michael A. Balduzzi

Attachments:
1. Evaluation of Proposed Changes, (14 pages)
2. Marked-Up Technical Specification and Bases Pages, (4 pages)
3. Retyped Technical Specification and Bases Pages, (3 pages)
4. Pilgrim Engineering Report, PNPS-RPT-04-0001, Rev.0 (160 pages)
5. PNPS Procedure QA 20.02, Rev. 2 "First Ten-Year Interval IWE Containment Inspection Program", (29 pages)

cc:

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**Attachment 1 to 2.04.027**

Evaluation of Proposed Changes

Subject: Request for One-time Integrated Leak Rate Test (ILRT) Interval Extension

1. DESCRIPTION
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1. <u>DESCRIPTION</u>

The proposed license amendment would revise Technical Specification section 4.7.A.2.a "Primary Containment Integrity" to allow a one-time interval extension of no more than five (5) years for the Pilgrim Nuclear Power Station (PNPS) Type A, Integrated Leakage Rate Test (ILRT). This revision is a one time exception to the ten (10) year frequency of the performance-based leakage rate testing program for Type A tests as required by NEI 94-01, Revision 0, "Industry Guideline For Implementing Performance-Based Option of 10 CFR Part 50, Appendix J" (Reference 1), and endorsed by 10 CFR 50, Appendix J, Option B. The proposed one-time exception is to the requirement of NEI 94-01 to perform an ILRT at a frequency of up to ten years, with allowance for a 15-month extension. The requested exception is to allow the ILRT to be performed within fifteen years from the last ILRT, which was performed on May 25, 1995.

Entergy requests approval of the proposed amendment by March 16, 2005 to support Pilgrim's upcoming Refueling Outage 15 scheduled to commence on April 16, 2005.

2. <u>PROPOSED CHANGES</u>

The following changes are proposed:

A. Add the following exception to Technical Specification 4.7.A.2.a,

   NEI 94-01-1995, Section 9.2.3: The first Type A Test performed after the May 25, 1995 Type A test shall be performed no later than May 25, 2010."

B. In Technical Specification Section 4.7.A.2.a, Footnote (*) and in the corresponding Technical Specification Bases, correct the text to remove an obsolete alphanumeric identifier that was used to refer to "surveillance frequency" which is defined in Technical Specifications Section 1.0.

   For section 4.7.A.2.a Footnote (*) "*Definition 1.U is not applicable to Leak Rate Tests*", replace the words "Definition 1.U" with the words "The definition of Surveillance Frequency" so that the corrected footnote statement will read: "*The definition of Surveillance Frequency is not applicable to Leak Rate Tests.*"

   For the Bases section, in the statement "*A note is included in Surveillance 4.7.A.2.a stating that definition 1.U is not applicable*" replace the words "definition 1.U" with the words "the definition of Surveillance Frequency" so that the corrected statement will read: "*A note is included in Surveillance 4.7.A.2.a stating that the definition of Surveillance Frequency is not applicable.*"

C. Minor reformatting of some of the existing text contained on Technical Specification pages 3/4.7-4 and 3/4.7-5 to improve consistency in its presentation.

3. <u>BACKGROUND</u>

*10 CFR 50, Appendix J, Option B Requirements:*

The testing requirements of 10 CFR 50, Appendix J, provide assurance that leakage from the containment, including systems and components that penetrate the containment, does not exceed the allowable leakage values specified in the Technical Specifications. The limitation of containment leakage provides assurance that the containment would perform its design function following an accident up to and including the plant design basis accident. Appendix J identifies three types of required tests: Type A tests, intended to measure the primary containment overall integrated leakage rate; Type B tests, intended to detect local leaks and to measure leakage across pressure-containing or leakage-limiting boundaries for primary containment penetrations; and Type C tests, intended to measure containment isolation valve leakage rates. Type B and C tests identify the vast majority of potential containment leakage paths. Type A tests identify overall (integrated) containment leakage rate and serve to ensure continued leakage integrity of the containment structure by evaluating those structural parts of the containment not covered by Type B and C testing.

10 CFR 50, Appendix J, was revised, effective October 26, 1995, to allow licensees to choose containment leakage testing under Option A "Prescriptive Requirements" or Option B "Performance-Based Requirements." In October 1996, Amendment 167 (Reference 2) was issued to the Pilgrim Operating License to permit implementation of 10 CFR 50, Appendix J, Option B. Amendment 167 amended Technical Specification section 4.7.A.2.a requiring Type A, B and C testing in accordance with Regulatory Guide (RG) 1.163 (Reference 3). Regulatory Guide 1.163 specifies a method acceptable to the NRC for complying with Option B by approving the use of NEI 94-01 and ANSI/ANS 56.8 - 1994 (Reference 4), subject to several regulatory positions in the guide. NEI 94-01 specifies an initial Type A test interval of 48 months, but allows an extended interval of ten years, based upon two consecutive successful tests. There is also a provision for extending the test interval an additional fifteen months under certain circumstances.

The adoption of the Option B performance-based containment leakage rate testing program did not alter the basic method by which Appendix J leakage rate testing is performed, but did alter the frequency of measuring primary containment leakage in Type A, B, and C tests. Frequency is based upon an evaluation which looks at the "as found" leakage history to determine a frequency for leakage testing which provides assurance that leakage limits will be maintained. The changes to Type A test frequency allowed by Option B do not directly result in an increase in containment leakage, only the interval at which such leakage is measured on an integrated basis. Similarly, the proposed change to the Type A test frequency will not directly result in an increase in containment leakage.

The extended frequency interval for testing allowed by NEI 94-01 is based upon a generic evaluation documented in NUREG-1493, "Performance-Based Containment Leak-Test Program" (Reference 5). NUREG-1493 made the following observations in Section 10.1.2 with regard to extending the test frequency:

- Reducing the frequency of Type A tests (ILRTs) from the current three per ten years to one per twenty years was found to lead to an imperceptible increase in risk. The estimated increase in risk is very small because ILRTs identify only a few potential containment leakage paths that cannot be identified by Type B and C testing, and the leaks that have been found by Type A tests have been only marginally above existing requirements. Given the insensitivity of risk to containment leakage rate, and the small fraction of leakage detected solely by Type A testing, increasing the interval between ILRTs is possible with minimal impact on public risk.

- While Type B and C tests identify the vast majority (greater than 95%) of all potential leakage paths, performance-based alternatives are feasible without significant risk impacts. Since leakage contributes less than 0.1 percent of overall risk under existing requirements, the overall effect is very small.

Exceptions to the requirements of RG 1.163, are allowed by 10 CFR 50, Appendix J, Option B, Section V.B, "Implementation," which states "The regulatory guide or other implementation document used by a licensee, or applicant for an operating license, to develop a performance-based leakage-testing program must be included, by general reference, in the plant technical specifications. The submittal for technical specification revisions must contain justification, including supporting analyses, if the licensee chooses to deviate from methods approved by the Commission and endorsed in a regulatory guide." Since exceptions meeting the stated requirements are permitted, Technical Specification amendment requests satisfying these requirements do not require an exemption to Option B.

## 4. TECHNICAL ANALYSIS

***10CFR50 Appendix J, Option B Plant Specific Implementation***

As previously stated, Amendment 167 to the Pilgrim Operating License permitted implementation of 10 CFR 50, Appendix J, Option B for Pilgrim. Amendment 167 requires Type A, B, and C testing be conducted in accordance with Regulatory Guide (RG) 1.163, which in turn endorses the methodology for complying with Option B identified in NEI 94-01. The surveillance frequency for Type A testing in NEI 94-01 is at least once per ten years based on an acceptable performance history (i.e., two consecutive periodic Type A tests at least 24 months apart where the calculated performance leakage rate was less than $1.0L_a$,) and consideration of the performance factors in NEI 94-01, Section 11.3. The three most recent Type A tests at Pilgrim have been satisfactory.

The performance leakage rates are calculated in accordance with NEI 94-01, Section 9.1.1. The performance leakage rate includes the Type A Upper Confidence Limit (UCL) plus the as-left minimum pathway leakage rate for all Type B and C pathways not in service, isolated, or not lined up in their test position. In addition, leakage pathways that were isolated during the performance of the test because of excessive leakage are included in the test results by adding the as-found minimum pathway leakage rate to the Type A UCL. The performance leakage rate does not include leakage savings (i.e., improvements to Type B and C components made prior to the Type A test).

> *For the August 1991 periodic Type A test, the Total Time UCL leakage rate was 0.3322% wt./ day. The minimum pathway leakage rate for Type B and C pathways not in service and water level corrections was 0.065% wt./day. The performance leakage rate was 0.3322% + 0.065% = 0.3972 % wt./day, which was acceptable. There were no leakage pathways isolated due to excessive leakage during the performance of the test. (Reference 6)*
>
> *For the May 1993 periodic Type A test, the total time UCL leakage rate was 0.2158% wt./day. The minimum pathway leakage rate for Type B and C pathways*

*not in service and water level corrections was 0.1335% wt./day. Therefore, the performance leakage rate was 0.2158% + 0.1335% = 0.3493% wt./day. There were no leakage pathways isolated due to excessive leakage during the performance of the test. (Reference 7)*

*For the May 1995 periodic Type A test, the total time UCL leakage rate was 0.2566% wt./day. The minimum pathway leakage rate for Type B and C pathways not in service and water level corrections was 0.1158% wt./day. Therefore, the performance leakage rate was 0.2566% + 0.1158% = 0.3724% wt./day. There were no leakage pathways isolated due to excessive leakage during the performance of the test. (Reference 8)*

These results compare with an acceptable design leakage rate for Pilgrim of 0.5%/day at a pressure of 56 psig. Based upon these three consecutive successful tests, the current ILRT interval requirement for Pilgrim is ten years.

***Plant Testing and Inspection Programs***

In addition to periodic Type A testing, various inspections and tests are routinely performed to assure primary containment integrity. These include Type B and C testing performed in accordance with Appendix J, Option B; inspection activities performed as part of the plant Inservice Inspection program; Technical Specification related inspections; and others. The aggregate results of these tests and inspections serve to provide a high degree of assurance of continued primary containment integrity.

- Type B and Type C Program

  The Pilgrim Appendix J, Type B and Type C test program is described in Procedure 8.7.1.3 "Local Leak rate Test Program" and Procedure 8.7.1.3.1 "Performance-Based Leakage Testing of the Primary Containment". Regarding the scope of these procedures, the procedures require:

  *Electrical penetrations, airlocks, hatches, flanges, and valves within the scope of the Appendix J Program Plan and which are not exempt shall be tested in compliance with the requirements of 10 CFR 50 Appendix J Option B and Regulatory Guide 1.163.*

  *The Type B and C test program provides a means to detect or measure leakage across pressure containing or leakage limiting barriers of the primary reactor containment. The results of the test program are used to ensure that proper maintenance and repairs are made on the primary reactor containment components over their service life. The Type B and C test program provides a means to protect the health and safety of plant personnel and the public by maintaining the leakage from these components below required levels.*

  *The Type B and C test program consists of local leak rate testing of penetrations which utilize a resilient seal, expansion bellows, double gasketed manways, hatches, and flanges, drywell airlock, and containment isolation valves that serve as a barrier to the release of the post accident primary containment atmosphere.*

*These components are tested with air or nitrogen at a pressure greater than or equal to 45 psig ($P_a$), except for the Main Steam Isolation Valves and Drywell Airlock inner and outer door seals which are tested at 23 psig and 10 psig, respectively (this does not account for instrument inaccuracies). Tests performed on-line will assure that full accident differential pressure is applied across the barrier under test, accounting for containment inerting, or system head pressure.*

As previously noted, Type B and Type C testing evaluate all but a small portion of potential containment leakage pathways. Nothing in this amendment request affects the scope, performance or scheduling of Type B or Type C tests. These programs will continue to provide a high degree of assurance that primary containment integrity is maintained.

- Inservice Inspection (ISI) Program

Effective September 1996, the NRC endorsed Subsections IWE and IWL of ASME Section XI, 1992 Edition including 1992 Addenda. These subsections contain inservice inspection and repair/replacement rules for Class MC and Class CC components. The Pilgrim reactor containment is a free-standing steel containment, to which the requirements of Subsection IWE apply.

For Pilgrim, these requirements are included in the inservice inspection program described in PNPS Procedure QA 20.03 "First Ten-Year Interval IWE Containment Inspection Program". The current revision of this procedure is provided as Attachment 5 to this amendment request. The First Ten-Year Interval for IWE containment inspections for Pilgrim started September 9, 1998 and is effective through September 9, 2008. The program contained in Procedure QA 20.03 details inservice inspection requirements for Class MC components in accordance with the requirements of 10CFR50.55a(b)(2) and the 1992 Edition of ASME Boiler and Pressure Vessel Code Section XI including 1992 Addenda, Inspection Program B. There are six Relief Requests in effect for Pilgrim (TAC No MA 4285).

*INSPECTION ACTIVITIES*

*Generic Letter 87-05*

In response to Generic Letter 87-05 Pilgrim performed ultrasonic thickness measurements of the drywell shell plates adjacent to the sand cushion. No evidence of corrosion was found. Also, boroscopic examinations of the annulus drain lines were performed. These inspections verified the integrity of the liner and that the lines were not plugged including no evidence of leakage. Pilgrim continues to monitor for leakage from the annulus drain lines after flood up and just prior to drain down during each refuel outage.

*IWE Program*

The Base IWE Program includes examination of containment surface Category E-A; pressure retaining bolting Category E-G, and containment supports Category F-A.

*Category E-G and F-A*

Non-conforming bolting and supports have been found. All were dispositioned with only minor rework (chase threads, re-torque) and replacement of bolting.

*Category E-A Examinations*

As part of the Category E-A examinations Pilgrim has performed two ASME XI IWE General Visual Walk downs, the last one was in RFO 14 (2003). This examination is performed to detect evidence of degradation that may affect either leak-tightness or structural integrity of the Primary Containment. Included in this examination are all accessible interior and exterior pressure retaining surfaces and their integral attachments. The examination focuses on coating flaws such as cracking, peeling, flaking, blistering, rusting, and discoloration. Any mechanical damage, pitting and arc strikes observed are recorded and evaluated. Both examinations have resulted in condition reports, which were disposition by a Professional Engineer and found to be acceptable.

*Augmented Examination Program*

In addition to Base IWE Program and the General Visual Walk down, Pilgrim developed an extensive Augmented Examination program. This program was created by searching the design for possible drainage channels, which could lead to corrosion, or by selecting added components, which could affect the containment.

Included in the Augmented Examination Program are:

A) The before mentioned annulus drain lines for detection of leakage
B) Low point on the Drywell to Torus main vent pipes (8 locations) due to the dead leg design and possible accumulation of water. A VT-1 examination is performed.
C) Drywell shell due to strips of polyurethane foam used and left in place during construction. The possibility exists that moisture would be retained in the foam, leading to corrosion. The examination is an ultrasonic thickness measurement of selected areas of the shell. Also, ultrasonic thickness measurements were made at the junction of the drywell shell and the floor at the bottom of the drywell. This area may accumulate water since it is the low point.
D) Torus shell due to possible corrosion. In this case ultrasonic thickness readings are taken on a sample basis at the mean water level and in the submerged part of the torus.
E) The liner drains for refuel floor water reservoirs are monitored for leakage. Leakage from the drains may be a precursor to leakage, which could affect the containment.

The augmented examinations documented corrosion in the Drywell to Torus main vent low points, which was below minimum wall thickness but was found acceptable by evaluation. The scope was expanded to all other vents to evaluate the extent, and corroded areas were recoated. In other areas, examinations for corrosion and other attributes have not identified any significant issues or any active degradation mechanisms.

***Plant Operational Performance:***

The Pilgrim Nuclear Power Station is a 2028 Mw(t), General Electric Boiling Water Reactor (BWR3). The reactor is contained in a Mark 1, Free Standing Steel Containment Building. The containment consists of two primary interconnected structures: the drywell, housing the reactor and related components, and a toroidal suppression chamber (torus). The drywell, which includes the major primary containment volume, is inerted with nitrogen and maintained at a nominal 1.17 psid positive pressure with respect to the torus. This pressure differential is required by Technical Specifications (LCO 3.7.A.1.i) and monitored by plant during instrumentation and through periodic surveillance requirement (4.7.A.1.f). The pressure differential is initially established during drywell inerting by pressurizing the drywell using plant nitrogen. During normal plant operation, the combination of a small amount of normal instrument nitrogen leakage within the drywell and leak tightness of the containment structure is such that nitrogen typically does not have to be added to the drywell to maintain the required pressure differential.

Although the pressure is not as significant as that resulting from a Design Basis Accident, the fact that the containment is normally pressurized provides a degree of assurance of containment structural integrity (i.e. no large leak paths in the containment structure). Significant leakage would be identified through increased nitrogen usage (periodically monitored) needed to maintain the required differential pressure, and would be investigated promptly and addressed within the scope of the plant Corrective Action system. This feature is a complement to periodic visual inspections of the interior and exterior of the containment structure, and serves to provide added assurance of structural integrity for those areas that may be inaccessible for visual examination.

***Plant Specific Risk Assessment***

Attachment 4 contains a detailed, plant specific risk assessment performed in support of this amendment request. This assessment evaluates the risk impact of extending the Type A test interval for Pilgrim from ten to fifteen years. The assessment complements the studies cited in NUREG-1493 that concluded that Type A testing intervals could be extended to as much as twenty years with negligible impact on risk.

The conclusions of the plant specific assessment are that effects on risk from the requested change are negligible or non-risk significant. Methodology and a summary of results are as follows:

- <u>Approach and Methodology:</u>

  In performing the risk assessment evaluation, the guidelines of NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J", the methodology used in EPRI TR-104285, "Risk Assessment of Revised Containment Leak Rate Testing Intervals," and the NRC Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis" were used. The assessment also followed the guidance and additional information distributed by NEI in November 2001 to their Administrative Points of Contact regarding risk assessment evaluation of one-time extensions of containment ILRT intervals and the approach outlined in the Indian Point Unit Three Nuclear Power Plant ILRT extension submittal.

The risk assessment evaluation uses the current Pilgrim Individual Plant Examination (IPE) internal events model that includes a Level 2[1] analysis of core damage scenarios and subsequent containment response resulting in various fission product release categories (including no release). The release category end states from the Pilgrim Level 2 model are also applied to align with those used by the NRC in NUREG/CR-4551 for Peach Bottom Unit 2. This categorization allows the population dose information provided in NUREG/CR-4551 (adjusted by estimated changes in population since the publication of that document) to be used as a consequence model to provide an estimate of the person-rem dose per reactor year associated with various scenarios. The change in plant risk is then evaluated based on the potential change in population dose rate (person-rem/yr), change in Large Early Release Frequency (LERF), and the change in conditional containment failure probability (CCFP).

In addition to the internal events risk assessment evaluation, the impact associated with extending the Type A test frequency interval was further examined by considering external event hazard or potential containment liner corrosion. The purpose for these additional evaluations was to assess whether there are any unique insights or important quantitative information associated with the explicit consideration of external event hazard or containment liner corrosion in the risk assessment results. The external event hazards or potential containment liner corrosion evaluation was found not to impact any of the above conclusions.

- <u>Summary of Results:</u>

The conclusion of the plant internal events risk associated with extending the Type A ILRT interval from ten to fifteen years is as follows.

1) The increase in risk on the total integrated plant risk as measured by person-rem/year increases for those accident sequences influenced by Type A testing, given the change from a 1-in-10 years test interval to a 1-in-15 years test interval, is found to be 0.009% (0.002 person rem/yr). This value can be considered to be a negligible increase in risk.

2) Regulatory Guide 1.174 provides guidance for determining the risk impact of plant-specific changes to the licensing basis. Regulatory Guide 1.174 defines very small changes in risk as resulting in increases of core damage frequency (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 1-in-10 years to 1-in-15 years is $1.97 \times 10^{-9}$/ry. Since Regulatory Guide 1.174 defines very small changes in LERF as below $10^{-7}$/yr, increasing the ILRT interval at Pilgrim from the currently allowed one-in-ten years to one-in-fifteen years is non-risk significant from a risk perspective.

3) The change in conditional containment failure probability (CCFP) is calculated to demonstrate the impact on 'defense-in-depth'. For the current ten-year ILRT interval, sequences involving no containment failure or small releases contribute

[1] Level 2 - the evaluation of containment response to severe accident challenges and quantification of the mechanisms, amounts, and probabilities of subsequent radioactive material releases from the containment.

1.67% to the overall plant risk. Alternatively stated, the contribution of sequences involving containment failure for the ten-year internal is 98.33%. These numbers are consistent with those documented in the Pilgrim IPE. For the proposed fifteen-year interval, the contribution of sequences involving containment failure increased to 98.36%. Therefore, $\Delta CCFP_{10\text{-}15}$ is found to be 0.03%. This signifies a very small increase and represents a negligible change in the Pilgrim containment defense-in-depth.

Additional risk considerations (external event hazards, potential containment liner corrosion) were also evaluated, with a similar conclusion that the requested test interval extension poses negligible risk. These evaluations are summarized in Attachment 4.

***Proposed Changes for Correction of Information and Reformatting***

The proposed correction to the statements in Technical Specification section 4.7.A.2.a and its Bases section removes the alphanumeric identifier (i.e., "definition 1.U") no longer used in Pilgrim Technical Specifications and replaces it with "the definition of surveillance frequency" to which the identifier once referred. These proposed changes are editorial in nature. The proposed changes serve to clarify the information for the user by removing obsolete information and do not change the intent or applicability of the information presented.

License Amendment 177 to the Pilgrim Technical Specifications removed the alphanumeric designations that were used to identify each definition in Section 1.0. The definitions were retained. The term "Surveillance Frequency" and its definition was previously identified as definition 1.U. Apparently, this specific use of the alphanumeric identifier for the definition of Surveillance Frequency in Section 4.7.A.2.a and in its Bases was not identified at the time that the Technical Specifications were being revised to remove the alphanumeric designations. This is an editorial correction only. There is no change to the definition of Surveillance Frequency or to its application.

The proposed formatting changes to existing information in TS section 4.7.A.2.a improve the visual presentation of the contained information. This is intended as a human factors improvement and does not change the intent or applicability of the information presented.

***Conclusion***

Previous Type A tests confirm that the Pilgrim reactor containment structure exhibits extremely low leakage and represents minimal risk to increased leakage. The risk is minimized by continued Type B and Type C testing, reinforced by the Inservice Inspection (ISI) program and technical specification inspections, by other periodic walkdowns and inspections, and by operating experience with a containment that normally operates at a positive pressure. These, in aggregate, provide continuing confidence in containment integrity.

This experience is supplemented by studies, including a plant specific risk analysis, that conclude that the risk associated with extending the Type A test interval on a one-time basis as requested is negligibly small.

It is therefore concluded that the cost-beneficial, risk informed change represented by this request is prudent and reasonable, and that the requested change involves no significant hazards as further documented in the following section.

## 5. REGULATORY SAFETY ANALYSIS

### 5.1 No Significant Hazards Consideration

Entergy Nuclear Operations, Inc. (Entergy) is proposing to modify the Pilgrim Station Technical Specifications (TS) to revise section 4.7.A.2.a "Primary Containment Integrity" to allow a one-time interval extension of no more than five (5) years for the PNPS Type A, Integrated Leakage Rate Test (ILRT). The proposed change would add the following exception to TS section 4.7.A.2.a: "NEI 94-01-1995. Section 9.2.3: The first Type A Test performed after the May 25, 1995 Type A test shall be performed no later than May 25, 2010." In addition, Entergy proposes to make a correction to two separate, but related statements in TS section 4.7.A.2.a and in its Bases that refers to "surveillance frequency" which is defined in TS section 1.0. The statements contain an obsolete alphanumeric identifier once used as the designation for the TS Section 1.0 definition of Surveillance Frequency. The proposal is to correct the two statements by replacing the words "Definition 1.U" in the statements with the words "The definition of Surveillance Frequency". Finally, as a human factors consideration, Entergy proposes to make minor formatting changes to other information currently in TS section 4.7.A.2.a to improve the visual presentation of the text. No changes to the actual information are made or proposed.

Entergy 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:

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

   Response: No.

   The proposed revision to Technical Specifications adds a one-time extension to the current interval for Type A testing. The current test interval of ten years, based on past performance, is extended on a one-time basis to fifteen years from the last Type A test. The proposed extension to Type A testing cannot increase the probability of an accident previously evaluated since the containment Type A testing extension is not a modification and the test extension is not of a type that could lead to equipment failure or accident initiation.

   The proposed extension to Type A testing does not involve a significant increase in the consequences of an accident since research documented in NUREG-1493 has found that, generically, very few potential containment leakage paths are not identified by Type B and C tests. The NUREG concluded that reducing the Type A (ILRT) testing frequency to one per twenty years was found to lead to an imperceptible increase in risk. These generic conclusions were confirmed by a plant specific risk analysis performed using the current Pilgrim Individual Plant Examination (IPE) internal events model that concluded the consequences are low to negligible.

Testing and inspection programs in place at Pilgrim also provide a high degree of assurance that the containment will not degrade in a manner detectable only by Type A testing. The last three Type A tests show leakage to be below acceptance criteria, indicating a very leak tight containment. Type B and C testing required by Technical Specifications will identify any containment opening such as valves that would otherwise be detected by the Type A tests. Inspections, including those required by the ASME code and the maintenance rule are performed in order to identify indications of containment degradation that could affect that leak tightness.

The proposed corrections to remove the alphanumeric identifier (i.e., definition 1.U) no longer used in Pilgrim Technical Specifications from the statements regarding the applicability of surveillance frequency to leak rate tests are editorial in nature. Likewise, the proposed formatting changes to existing information to improve its presentation are also editorial in nature. These proposed changes cannot increase the probability or consequences of previously analyzed accidents. The proposed changes serve to clarify the information for the user and do not change the intent or applicability of the information presented.

Therefore, the proposed changes do not represent a significant increase in the probability or consequences of an accident previously analyzed.

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

   Response: No.

   The proposed revision to Technical Specifications adds a one time extension to the current interval for Type A testing. The current test interval of ten years, based on past performance, would be extended on a one time basis to fifteen years from the last Type A test. The proposed extension to Type A testing cannot create the possibility of a new or different type of accident since there are no physical changes being made to the plant and there are no changes to the operation of the plant that could introduce a new failure mode creating an accident or affecting the mitigation of an accident.

   The proposed corrections to remove the alphanumeric identifier (i.e., definition 1.U) no longer used in Pilgrim Technical Specifications from the statements regarding the applicability of surveillance frequency to leak rate tests are editorial in nature. Likewise, the proposed formatting changes to existing information to improve its presentation are also editorial in nature. These proposed changes cannot create the possibility of a new or different kind of accident from any accident previously analyzed. The proposed changes serve to clarify the information for the user and do not change the intent or applicability of the information presented.

   Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously analyzed.

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

   Response: No.

   The proposed revision to Technical Specifications adds a one time extension to the current interval for Type A testing. The current test interval of ten years, based on past performance, would be extended on a one time basis to fifteen years from the last Type A test. The proposed extension to Type A testing will not significantly reduce the margin of safety. The NUREG 1493 generic study of the effects of extending containment leakage testing found that a 20-year extension in Type A leakage testing resulted in an imperceptible increase in risk to the public. NUREG - 1493 found that, generically, the design containment leakage rate contributes about 0.1 percent to the individual risk and that the decrease in Type A testing frequency would have a minimal affect on this risk since 95% of the potential leakage paths are detected by Type C testing. This was further confirmed by a plant specific risk assessment using the current Pilgrim Individual Plant Examination (IPE) internal events model that concluded the risk associated with this change is negligibly small and/or non-risk significant.

The proposed corrections to remove the alphanumeric identifier (i.e., definition 1.U) no longer used in Pilgrim Technical Specifications from the statements regarding the applicability of surveillance frequency to leak rate tests are editorial in nature. Likewise, the proposed formatting changes to existing information to improve its presentation are also editorial in nature. These proposed changes do not involve a significant reduction in the margin of safety. The proposed changes serve to clarify the information for the user and do not change the intent or applicability of the information presented.

Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

5.2 Environmental Consideration

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 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental assessment needs to be prepared in connection with the proposed amendment.

## 6. COORDINATION WITH OTHER PENDING TS CHANGES

There are no other pending TS changes that would be affected by this proposed license amendment.

## 7. PRECEDENTS

The NRC has approved similar risk-informed submittals relating to a one-time extension of a Type A test interval for a number of plants. Examples include LaSalle Units 1 & 2 (TAC NOs. MB9004 and MB9005), Hope Creek (TAC NO. MB6551), and Duane Arnold Energy Center (TAC NO. MB4752).

## 8. REFERENCES


1. NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J"
2. Amendment No. 167 to Facility Operating License No. DPR-35 (TAC No. M95326)
3. Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program"
4. ANSI/ANS 56.8 – 1994, "Containment System Leakage Testing Requirements"
5. NUREG-1493, "Performance-Based Containment Leak-Test Program"
6. General Physics Corporation Report No. GP-R-263118, "Reactor Containment Building Integrated Leakage Rate Test", dated August 5,1991
7. General Physics Corporation Report No. GP-R-643011, "Reactor Containment Building Integrated Leakage Rate Test Final Report", dated May 19, 1993
8. General Physics Corporation Report No. GP-R-66195010, "Reactor Containment Building Integrated Leakage Rate Test Final Report", dated May 25, 1995

**Attachment 2 to 2.04.027**

Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Plant

Proposed Amendment to the Technical Specifications

Marked-Up Technical Specifications and Bases Pages (4 pages)

Technical Specification Pages
TS Page 3/4.7-4
TS Page 3/4.7-5

Bases Pages
B3/4.7-4

| LIMITING CONDITIONS FOR OPERATION | SURVEILLANCE REQUIREMENTS |
|---|---|
| 3.7 CONTAINMENT SYSTEMS (Cont) | 4.7 CONTAINMENT SYSTEMS (Cont) |
| A. Primary Containment (Cont) | A. Primary Containment (Cont) |
| Primary Containment Integrity | Primary Containment Integrity |

**3.7.A.2.a.** Primary containment integrity shall be maintained at all times when the reactor is critical or when the reactor water temperature is above 212°F and fuel is in the reactor vessel except while performing "open vessel" physics tests at power levels not to exceed 5 Mw(t).

Primary containment integrity means that the drywell and pressure suppression chamber are intact and that all of the following conditions are satisfied:

1. All manual containment isolation valves on lines connected to the reactor coolant system or containment which are not required to be open during accident conditions are closed.
2. At least one door in each airlock is closed and sealed.
3. All blind flanges and manways are closed.
4. All automatic primary containment isolation valves and all instrument line flow check valves are operable except as specified in 3.7.A.2.b.

**4.7.A.2.a.** The primary containment integrity shall be demonstrated by performing Primary Containment Leak Tests in accordance with 10CFR50 Appendix J, Option B and Regulatory Guide 1.163 dated September 1995*, with exemptions as approved by the NRC and exceptions as follows: 6

1. The main steam line isolation valves shall be tested at a pressure ≥23 psig, and normalized to a value equivalent to $P_a$. 6
2. Personnel air lock door seals shall be tested at a pressure ≥10 psig. Results shall be normalized to a value equivalent to $P_a$. 6
3. Leakage rate acceptance criteria are:
    1. Primary containment overall leakage rate acceptance criterion is <1.0 $L_a$. During the first unit startup following testing in accordance with the Containment Leakage Rate Testing Program, the leakage rate acceptance criteria are ≤ 0.60 $L_a$ for the Type B and Type C tests and ≤ 0.75 $L_a$ for the Type A tests. 6
    2. Overall air lock leakage rate is ≤0.05 $L_a$ when tested at ≥ $P_a$ 6
    3. Door seals leakage rate is ≤0.01 $L_a$ when pressurized to ≥ 10 psig.

* The ~~d~~Definition ~~(X)~~ of Surveillance Frequency is not applicable to Leak Rate Tests.

3.7 CONTAINMENT SYSTEMS (Cont)

A. Primary Containment (Cont)

5. All containment isolation check valves are operable or at least one containment isolation valve in each line having an inoperable valve is secured in the isolated position.**

INSERT A

Primary Containment Isolation Valves

2. b. In the event any automatic Primary Containment Isolation Valve becomes inoperable, at least one containment isolation valve in each line having an inoperable valve shall be deactivated in the isolated condition. (This requirement may be satisfied by deactivating the inoperable valve in the isolated condition. Deactivation means to electrically or pneumatically disarm, or otherwise secure the valve.)*

* Isolation valves closed to satisfy these requirements may be reopened on an intermittent basis under ORC approved administrative controls.

** Check valve 30-CK-432 will be considered operable until reverse flow testing is performed no later than the 1998 maintenance outage.

4.7 CONTAINMENT SYSTEMS (Cont)

A. Primary Containment (Cont)

4. Combined main steam lines: ~~46~~
INDENT → 46 scfh @ 23 psig.

where $P_a$ = 45 psig
$L_a$ = 1.0% by weight of the contained air @ 45 psig for 24 hrs.

Primary Containment Isolation Valves

2. b. 1. The primary containment isolation valves surveillance shall be performed as follows:

a. At least once per operating cycle the operable primary containment isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and closure times.

b. Test primary containment isolation valves:

1. Verify power operated primary containment isolation valve operability as specified in 3.13.

2. Verify main steam isolation valve operability as specified in 3.13.

Insert A

4. NEI 94-01-1995. Section 9.2.3: The first Type A test performed after the May 25, 1995 Type A test shall be performed no later than May 25, 2010.

**BASES:**

3/4.7 CONTAINMENT SYSTEMS (Cont)

A. Primary Containment (Cont)

capability of the structure over its service lifetime. Additional margin to maintain the containment in the "as built" condition is achieved by establishing the allowable operational leak rate. The allowable operational leak rate is derived by multiplying the maximum allowable leak rate or the allowable test leak rate by 0.75 thereby providing a 25% margin to allow for leakage deterioration which may occur during the period between leak rate tests.

The primary containment leakage rate testing is based on the guidelines in Regulatory Guide 1.163 dated September 1995, NEI 94-01 Revision 0 dated July 25, 1995, and ANSI/ANS 56.8-1994. Specific acceptance criteria for as-found and as-left leakage rates, as well as methods of defining the leakage rates, are contained in the primary containment leakage rate testing program.

The primary containment leak rate test frequency is based on maintaining adequate assurance that the leak rate remains within the specification. The leak rate test frequency is in accordance with 10CFR50 App. J, Option B and Regulatory Guide 1.163 dated September 1995.

Type A, Type B, and Type C tests will be performed using the technical methods and techniques specified in ANSI/ANS 56.8 - 1994 or other alternative testing methods approved by the NRC.

INSERT: the definition of Surveillance Frequency — delete

A note is included in Surveillance 4.7.A.2.a stating that definition 1.U is not applicable. The 25% allowable extension of surveillance intervals is already included in the primary containment leakage rate testing program; therefore, an additional 25% is not allowed.

The penetration and air purge piping leakage test frequency, along with the containment leak rate tests, is adequate to allow detection of leakage trends. Whenever a bolted double-gasketed penetration is broken and remade, the space between the gaskets is pressurized to determine that the seals are performing properly. It is expected that the majority of the leakage from valves, penetrations and seals would be into the reactor building. However, it is possible that leakage into other parts of the facility could occur. Such leakage paths that may affect significantly the consequences of accidents are to be minimized. The personnel air lock is tested at 10 psig, because the inboard door is not designed to shut in the opposite direction.

Primary Containment Isolation Valves

Double isolation valves are provided on lines penetrating the primary containment and open to the free space of the containment. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss of coolant accident.

**Attachment 3 to 2.04.027**

Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Plant

Proposed Amendment to the Technical Specifications

Retyped Technical Specifications and Bases Pages (3 pages)

Technical Specification Pages
TS Page 3/4.7-4
TS Page 3/4.7-5

Bases Pages
B3/4.7-4

## LIMITING CONDITIONS FOR OPERATION

3.7 CONTAINMENT SYSTEMS (Cont)

A. Primary Containment (Cont)
Primary Containment Integrity

2. a. Primary containment integrity shall be maintained at all times when the reactor is critical or when the reactor water temperature is above 212°F and fuel is in the reactor vessel except while performing "open vessel" physics test at power levels not to exceed 5 Mw(t).

Primary containment integrity means that the drywell and pressure suppression chamber are intact and that all of the following conditions are satisfied:

1. All manual containment isolation valves on lines connected to the reactor coolant system or containment which are not required to be open during accident conditions are closed.
2. At least one door in each airlock is closed and sealed.
3. All blind flanges and manways are closed.
4. All automatic primary containment isolation valves and all instrument line flow check valves are operable except as specified in 3.7.A.2.b.

## SURVEILLANCE REQUIREMENTS

4.7 CONTAINMENT SYSTEMS (Cont)

A. Primary Containment (Cont)
Primary Containment Integrity

2. a. The primary containment integrity shall be demonstrated by performing Primary Containment Leak Tests in accordance with 10CFR50 Appendix J, Option B and Regulatory Guide 1.163 dated September 1995*, with exemptions as approved by the NRC and exceptions as follows:

1. The main steam line isolation valves shall be tested at a pressure $\geq$23 psig, and normalized to a value equivalent to $P_a$.
2. Personnel air lock door seals shall be tested at a pressure $\geq$10 psig. Results shall be normalized to a value equivalent to $P_a$.
3. Leakage rate acceptance criteria are:
    1. Primary containment overall leakage rate acceptance criterion is <1.0 $L_a$. During the first unit startup following testing in accordance with the Containment Leakage Rate Testing 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 the Type A tests.
    2. Overall air lock leakage rate is $\leq$ 0.05 $L_a$ when tested at $\geq P_a$.
    3. Door seals leakage rate is $\leq$ 0.01 $L_a$ when pressurized to $\geq$ 10 psig.

* The definition of Surveillance Frequency is not applicable to Leak Rate Tests.

LIMITING CONDITIONS FOR OPERATION

3.7 CONTAINMENT SYSTEMS (Cont)

A. Primary Containment (Cont)

5. All containment isolation check valves are operable or at least one containment isolation valve in each line having an inoperable valve is secured in the isolated position.**

Primary Containment Isolation Valves

2. b. In the event any automatic Primary Containment Isolation Valve becomes inoperable, at least one containment isolation valve in each line having an inoperable valve shall be deactivated in the isolated condition. (This requirement may be satisfied by deactivating the inoperable valve in the isolated condition. Deactivation means to electrically or pneumatically disarm, or otherwise secure the valve.)*

* Isolation valves closed to satisfy these requirements may be reopened on an intermittent basis under ORC approved administrative controls.

** Check valve 30-CK-432 will be considered operable until reverse flow testing is performed no later than the 1998 maintenance outage.

SURVEILLANCE REQUIREMENTS

4.7 CONTAINMENT SYSTEMS (Cont)

A. Primary Containment (Cont)

4. Combined main steam lines: 46 scfh @ 23 psig.

where,

$P_a$ = 45 psig
$L_a$ = 1.0% by weight of the contained air @ 45 psig for 24 hrs.

4. NEI 94-01-1995. Section 9.2.3: The first Type A test performed after the May 25, 1995 Type A test shall be performed no later than May 25, 2010.

Primary Containment Isolation Valves

2. b. 1. The primary containment isolation valves surveillance shall be performed as follows:

a. At least once per operating cycle the operable primary containment isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and closure times.

b. Test primary containment isolation valves:

1. Verify power operated primary containment isolation valve operability as specified in 3.13.

2. Verify main steam isolation valve operability as specified in 3.13.

capability of the structure over its service lifetime. Additional margin to maintain the containment in the "as built" condition is achieved by establishing the allowable operational leak rate. The allowable operational leak rate is derived by multiplying the maximum allowable leak rate or the allowable test leak rate by 0.75 thereby providing a 25% margin to allow for leakage deterioration which may occur during the period between leak rate tests.

The primary containment leakage rate testing is based on the guidelines in Regulatory Guide 1.163 dated September 1995, NEI 94-01 Revision 0 dated July 25, 1995, and ANSI/ANS 56.8-1994. Specific acceptance criteria for as-found and as-left leakage rates, as well as methods of defining the leakage rates, are contained in the primary containment leakage rate testing program.

The primary containment leak rate test frequency is based on maintaining adequate assurance that the leak rate remains within the specification. The leak rate test frequency is in accordance with 10CFR50 App. J, Option B and Regulatory Guide 1.163 dated September 1995.

Type A, Type B, and Type C tests will be performed using the technical methods and techniques specified in ANSI/ANS 56.8 - 1994, or other alternative testing methods approved by the NRC.

A note is included in Surveillance 4.7.A.2.a stating that the definition of Surveillance Frequency is not applicable. The 25% allowable extension of surveillance intervals is already included in the primary containment leakage rate testing program; therefore, an additional 25% is not allowed.

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Primary Containment Isolation Valves

Double isolation valves are provided on lines penetrating the primary containment and open to the free space of the containment. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss of coolant accident.

**Attachment 4 to 2.04.027**

Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Plant
<u>Proposed Amendment to the Technical Specifications</u>

Entergy Engineering Report No. PNPS-RPT-04-00001, Rev.0
"Risk Impact Assessment of Extending Containment Type A Test Interval"
(157 pages)