



Entergy Nuclear Operations, Inc.  
Pilgrim Nuclear Power Station  
600 Rocky Hill Road  
Plymouth, MA 02360

January 15, 2007

Michael A. Balduzzi  
Site Vice President

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

SUBJECT: Entergy Nuclear Operations, Inc.  
Pilgrim Nuclear Power Station  
Docket No. 50-293  
License No. DPR-35

Proposed Change to Applicability of Pilgrim's Pressure-Temperature  
Curves as Described in Technical Specification Figures 3.6.1, 3.6.2, and  
3.6.3, Revision 1

REFERENCE: 1. Entergy Letter No. 2.06.018, Proposed License Amendment to  
Change Technical Specification 3.6.A.2, Pressure-Temperature Limit  
Curves, dated April 12, 2006 (TAC No. MD1218)

LETTER NUMBER: 2.07.006

Dear Sir or Madam:

By Reference 1, Entergy requested NRC review and approval of changes to Pilgrim's pressure-temperature (P-T) curves described in Technical Specification Figures 3.6.1, 3.6.2, and 3.6.3 in accordance with 10 CFR 50.90. By letters dated October 16, 2006 and December 8, 2006, Entergy provided additional information. This letter contains a revised proposal and supersedes the original application in its entirety.

Commitments made in this letter are contained in Attachment 3. Entergy requests approval of the proposed amendment by April 2007 to support restart following RFO 16, which is scheduled to commence on April 6, 2007. Once approved, the amendment shall be implemented within 60 days.

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 15<sup>th</sup> day of JANUARY, 2007.

Sincerely,

  
Michael A. Balduzzi

ERS/dl

A001

Attachments:   1. Evaluation of Proposed Technical Specifications Amendment – 10 pages  
                  2. Proposed Technical Specifications Changes (mark-up) – 8 pages  
                  3. List of Regulatory Commitments - 1 page

cc:     Mr. James Shea, Project Manager  
          Plant Licensing Branch I-1  
          Division of Operating Reactor Licensing  
          Office of Nuclear Reactor Regulation  
          U.S. Nuclear Regulatory Commission  
          1 White Flint North O-8C2  
          11555 Rockville Pike  
          Rockville, MD 20852

          Mr. Robert Walker, Director  
          Massachusetts Department of Public Health  
          Schrafft Center Suite 1M2A  
          Radiation Control Program  
          529 Main Street  
          Charlestown, MA 02129

          U.S. Nuclear Regulatory Commission  
          Region 1  
          475 Allendale Road  
          King of Prussia, PA 19408

          Ms. Cristine McCombs, Director  
          Mass. Emergency Management Agency  
          400 Worcester Road  
          Framingham, MA 01702

          Senior Resident Inspector  
          Pilgrim Nuclear Power Station

# **ATTACHMENT 1**

**Letter Number 2.07.006**

## **Evaluation of Proposed Technical Specifications Amendment**

Subject: Change to Applicability of Pilgrim's Pressure-Temperature Curves as Described in Technical Specification Figures 3.6.1, 3.6.2, and 3.6.3.

1. DESCRIPTION
2. PROPOSED CHANGE
3. BACKGROUND
4. TECHNICAL ANALYSIS
5. REGULATORY SAFETY ANALYSIS
  - 5.1 No Significant Hazards Consideration
  - 5.2 Applicable Regulatory Requirements/Criteria
6. ENVIRONMENTAL CONSIDERATION
7. REFERENCES

1. Description

This letter is a request to amend Operating License DPR-35 for Pilgrim Nuclear Power Station regarding Pressure-Temperature (PT) limits expressed in Technical Specification (TS) Figures 3.6.1, 3.6.2, and 3.6.3. Entergy previously submitted a license amendment request dated April 12, 2006 proposing new P-T curves to replace those currently contained in TS (References 1, 2, and 3). However, the NRC expressed concerns about the benchmarking of data used for the proposed P-T curves and it is not possible to resolve these concerns in time to support restart following RFO 16. This letter contains a revised proposal and supersedes the original application in its entirety.

The proposed change contained herein applies to existing Pilgrim Technical Specification Figures 3.6.1, 3.6.2, and 3.6.3. These figures provide Pilgrim reactor vessel pressure-temperature (P-T) limits for 48 Effective Full Power Years (EFPYs). The current wording in the title block of these Figures limits the applicability of the P-T curves through operating cycle 16. This license amendment request seeks to extend the applicability of those curves through the end of operating cycle 18, which corresponds to approximately 26.3 EFPY. This will allow Pilgrim to restart following RFO 16 and operate for two cycles while the NRC concerns are resolved and new P-T curves are developed and submitted for approval.

License Amendment (LA) 197, dated March 28, 2003 (Reference 1) limited the use of current P-T curves through operating cycle 16. The existing TS P-T limit curves were reviewed and approved by the NRC in LA 197 largely due to the conservatism built into the curves. Beyond operating cycle 16, these P-T curves will continue to have sufficient design margin to assure a conservatism factor of approximately 1.8 if they are approved for use through operating cycle 18.

2. Proposed Change

Currently, the title blocks for Figures 3.6.1, 3.6.2, and 3.6.3 contain, in part, the words:

“The curve applies through Operating Cycle 16.”

The proposed amendment changes the words to:

“The curve applies through Operating Cycle 18.”

The proposed amendment also deletes five blank, unused pages in the TS that precede these Figures.

3. Background

The proposed amendment changes the application of the existing P-T curves intended to ensure the long-term integrity of Pilgrim's reactor pressure vessel. Information on Pilgrim's reactor pressure vessel may be found in Pilgrim's Updated Final Safety Analysis Report (UFSAR) Section 1.6.1.3.2, “Reactor Vessel and Internals,” and UFSAR Appendix M, “Reactor Pressure Vessel Design Report.”

By letter dated November 22, 2000, Entergy requested Technical Specification changes to update the pressure-temperature curves (Reference 5). This request was modified by letter dated February 2, 2001 (Reference 6). The fluence values for 20, 32, and 48 EFPYs were established from measurements and calculations related to the first

surveillance capsule removed in 1980. The methodology is described in Southwest Research Institute (SwRI) report SwRI Project No. 02-5951 (Reference 7) and supplement GE report MDE 277-1285 (Reference 8).

The requested change was issued by the NRC as Amendment 190 on April 13, 2001 (Reference 4). In the safety evaluation supporting LA 190 the NRC staff concluded that "the proposed P-T limits for the reactor coolant system for hydro testing, heat up, cool down, and criticality satisfy the requirements in Appendix G to Section XI of the ASME Code, as amended by Code Cases N-588 and N-640, and Appendix G of 10 CFR Part 50 for 20, 32, and 48 EFPYs. The proposed P-T limits also satisfy GL 88-11 since the licensee used the method in RG 1.99, Rev. 2 to calculate ART (Adjusted Reference Temperature). However, pending staff review of a new method to calculate neutron fluence, the proposed P-T limit curves may be incorporated into the Pilgrim TSs only through Operating Cycle 14."

The NRC noted in their safety evaluation for Amendment 190 that NRC believed Pilgrim's plant-specific dosimetry and/or calculations for the original fluence value were outdated. However, use of the pressure-temperature curves was acceptable for an interim period (one operating cycle) because there are two significant conservatisms in Pilgrim's fluence value: (1) the curves are estimated for 32 EFPY and were to be used by Amendment 190 to about 19 EFPYs which is a conservatism factor of 1.7; and (2) MDE Report No. 277-1285, (Reference 8) projects a conservatism of 25 percent in the predicted peak vessel fluence. The 32 EFPY P-T curves are bounding for operation until the end of the current license. Based on these conservatisms and considering the limited time of applicability (operating cycle 14) of the proposed P-T curves, LA 190 was issued by the NRC.

Prior to the end of operating cycle 14 Entergy submitted a license amendment request dated December 4, 2002 to use the 48 EFPY curve for two operating cycles. Also, this LAR sought to remove the 20 and 32 EFPY curves and the designators for 20, 32, and 48 EFPY from Figures 3.6.1, 3.6.2 and 3.6.3 for human factors reasons.

The requested change was issued by the NRC as Amendment 197 on March 28, 2003 (Reference 9). In the safety evaluation supporting LA 197 the NRC staff concluded that the use of the 48 EFPY curve through the end of operating cycle 16 (~23 EFPY) amounts to a conservatism factor of approximately 2.1 and that the 25 % fluence overestimation discussed above still applies providing additional conservatism in the fluence calculation. Although the vessel flux calculations do not adhere to R.G. 1.190, the NRC found that the proposed calculations have large conservatism built into the fluence estimate.

#### 4. Technical Analysis

##### 4.1 Analysis

The proposed change is to the expiration date of Pilgrim Technical Specification Figures 3.6.1, 3.6.2, and 3.6.3, which provide P-T limits for Pilgrim's reactor pressure vessel. This proposed change does not alter the curves issued by the NRC in LA 197. The proposed change replaces wording in the figures' title blocks that currently limit the curves' use to operating cycle 16. The change will extend use of the existing curves through the end of operating cycle 18.

Pilgrim began operation with 3 surveillance capsules located circumferentially along the reactor vessel inside radius at the 120-degree, 210-degree, and 300-degree azimuths and axially at the reactor vessel core mid-plane. Each surveillance capsule consists of three flux wires made of Copper, Iron and Nickel. The 120-degree capsule was withdrawn in 1980 after 4.17 EFPY of operation. The flux wire measurements derived from the Pilgrim surveillance capsule removed from the Pilgrim reactor vessel during the 1980 refueling outage and the neutron transport calculations performed in 1985 form the bases of the calculations of projected fluence values used to predict future adjustments to the reactor vessel pressure-temperature limits.

These fluence calculations are very conservative for the following reasons:

- The fluence data of 1980 was taken at the end of operating cycle 4. Pilgrim's operating cycle 4 had an unusually large number of new fuel bundles and consequently high exposure bundles were placed in the edge bundle locations. It was found that the vessel flux decreased with fuel cycles after operating cycle 4. Operating cycles 4, 5, 6, and 7 were used as a composite model for future core reloads and fluence values are projected out to the end of life based on the results of this composite model. Thus, projections of fluence based on this model would be conservatively high and the conservatism would compound when extrapolated out to end-of-life.
- As noted in the NRC SER supporting LA 197, GE MDE Report No. 277-1285 provided conservative projections that were 25% higher than predicted peak vessel fluence.
- The fluence calculations are used in the analyses of the reactor vessel beltline material to determine the projected shift in the Pilgrim pressure-temperature limit curves. These calculations were performed in accordance with the guidelines of NRC Reg Guide 1.99, Rev 2, which provides an additional statistical margin of conservatism for plate and weld material adjusted reference temperature. The determination of the shift in reference nil-ductility temperature, which relies on the fluence calculations, must also meet the requirements of 10 CFR 50, Appendix G and the ASME Code Appendix G which also provides additional conservatism to the pressure-temperature limits.

Pilgrim will continue to use the existing TS Figures 3.6.1, 3.6.2, and 3.6.3 for controlling plant operation. The actual EFPY at the end of the requested applicability are expected to be at approximately 26.3 EFPY. The requested change will continue to provide margin and a conservatism factor slightly greater than 1.8.

Based on the conservatisms noted above, a two cycle extension continues to provide a significant amount of protection from brittle fracture of the reactor vessel.

Also, an extension to operate through operating cycle 18 will provide the following benefits:

- Pilgrim is a member of the BWRVIP and participates in the Integrated Surveillance/Supplemental Surveillance (ISP/SSP) programs. These programs will provide new surveillance data that is not currently available. Pilgrim will benefit from the knowledge obtained from this program.
- The extension would give Pilgrim sufficient time to develop an action plan for improving benchmarking data to support development and approval of new P-T curves. Entergy proposed new P-T curves in a license amendment request dated April 12, 2006, however, the NRC expressed concerns about the benchmarking of data used for the proposed P-T curves, and it is not possible to resolve these concerns in time to support restart following RFO 16. Developing these plans and submitting the revised curves are regulatory commitments as identified in Attachment 3 to this letter.
- Pilgrim expects to reach slightly less than 26.3 EFPY by the end of Cycle 18, (April, 2011). Pilgrim will continue to apply the restrictions imposed by the existing curves on the reactor vessel pressure-temperature limits. The use of the existing pressure-temperature limit curves provides a conservative margin of at least 1.8 and, along with the additional margins previously discussed, will compensate for limitations of the current neutron transport calculations and compensate for the change in the activation and transport cross sections which have occurred since the calculations were performed.

The change to delete the five blank, unused TS pages that precede the P-T Figures is an editorial change to improve the presentation of the TS and involves no technical change.

#### 4.2 Summary

The current TS restriction limits use of the existing curves to the end of operating cycle 16. When license amendment 197 was approved, extending the use of the 48 EFPY curves through the end of operating cycle 16, it was believed that Pilgrim could develop up-to-date pressure-temperature curves that would be approved prior to the end of operating cycle 16. Entergy proposed new P-T curves in a license amendment request dated April 12, 2006, however, the NRC expressed concerns about the benchmarking for the data used and it is not possible to resolve these concerns in time to support restart following RFO 16. As an interim solution, this application proposes to extend the use of the existing P-T curves through the end of operating cycle 18.

Extending the use of the curves through the end of operating cycle 18 will result in a conservatism factor of approximately 1.8 to the 48 EFPY used to develop the TS curve. This factor combined with the 25 percent over-estimation in peak predicted fluence provides adequate margin and conservatism. Furthermore, the conservatism factor of 1.8 proposed in this application is comparable to that previously approved in License Amendment 190.

Based on these considerations, Pilgrim has concluded that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) Pilgrim's activities will



continue to be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5. Regulatory Safety Analysis

5.1 No Significant Hazards Consideration

Entergy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment extending the applicability of the Pressure-Temperature curves in Figures 3.6.1, 3.6.2, and 3.6.3 by focusing on the three standards set forth in 10 CFR50.92, "Issuance of Amendment," as discussed below:

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

Response: No.

The proposed License Amendment (LA) does not involve a significant increase in the probability or consequences of an accident previously evaluated. There are no physical changes to the plant being introduced by the proposed changes to a restriction associated with the pressure-temperature curves. The proposed change does not modify the reactor coolant pressure boundary, (i.e., there are no changes in operating pressure, materials, or seismic loading). The proposed change does not adversely affect the integrity of the reactor coolant pressure boundary such that its function in the control of radiological consequences is affected.

The current pressure-temperature curves were generated in accordance with the fracture toughness requirements of 10 CFR Part 50, Appendix G, and American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, Appendix G and NRC Regulatory Guide 1.99, Revision 2, "*Radiation Embrittlement of Reactor Vessel Materials*." The current pressure-temperature curves were established in compliance with the methodology used to calculate and predict effects of radiation on embrittlement of reactor vessel beltline materials. The use of the proposed pressure-temperature curves through operating cycle 18 is acceptable because sufficient margin exists between the actual Effective Full Power Years (EFPYs) and the Effective Full Power Years used to establish the 48 EFPY curve. This proposed license amendment provides compliance with the intent of 10 CFR Part 50, Appendix G, and provides margins of safety that assure reactor vessel integrity.

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

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

Response: No.

The proposed license amendment does not create the possibility of new or different kind of accident from any accident previously evaluated. The pressure-temperature curves were generated in accordance with the fracture toughness

requirements of 10 CFR Part 50, Appendix G, and ASME B&PV Code, Section XI, Appendix G. Compliance with the proposed pressure-temperature curves will ensure the avoidance of conditions in which brittle fracture of primary coolant pressure boundary materials is possible because such compliance with the current pressure-temperature curves provides sufficient protection against a non-ductile-type fracture of the reactor pressure vessel. No new modes of operation are introduced by the proposed change. The proposed change will not create any failure mode not bounded by previously evaluated accidents. Further, the proposed change does not affect any activities or equipment and is not assumed in any safety analysis to initiate any accident sequence. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No.

The current curves are based on established NRC and ASME methodologies in force when LA 197 was approved. The proposed license amendment requests the use of the proposed curves for two additional operating cycles. This is acceptable because sufficient margin exists between actual EFPYs and the EFPYs used in the development of the existing curves to yield a conservatism factor slightly in excess of 1.8.

Operation within the current limits ensures that the reactor vessel materials will continue to behave in a non-brittle manner, thereby preserving the original safety design bases. No plant safety limits, set points, or design parameters are adversely affected by the proposed changes. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

## 5.2 Applicable Regulatory Requirements/Criteria

### 5.2.1 Regulations

The NRC has established requirements in Title 10 of the Code of Federal Regulations Part 50 (10 CFR 50) to protect the integrity of the reactor coolant pressure boundary in nuclear power plants. The staff evaluates the pressure-temperature curves based on the following NRC regulations and guidance: 10 CFR Part 50, Appendix G; Generic Letter (GL) 88-11; GL 92-01, Revision 1; GL 92-01, Revision 1, Supplement 1; Regulatory Guide (RG) 1.99, Revision 2 (Rev. 2); and Standard Review Plan (SRP) Section 5.3.2. Generic Letter 88-11 advises licensees that the staff would use RG 1.99, Rev. 2, to review pressure-temperature limit curves. RG 1.99, Rev. 2, contains methodologies for determining the increase in transition temperature and the decrease in upper-shelf energy (USE) resulting from neutron radiation. Generic Letter 92-01, Rev. 1, requested that licensees submit their RPV data for their plants to the staff for review. Generic Letter 92-01, Rev. 1, Supplement 1, requested that licensees

provide and assess data from other licensees that could affect their RPV integrity evaluations. This data is used by the staff as the basis for the staff's review of pressure-temperature limit curves and as the basis for the staff's review of pressurized thermal shock (PTS) assessments (10 CFR 50.61 assessments). Appendix G to 10 CFR Part 50 requires that pressure-temperature limit curves for the RPV be at least as conservative as those obtained by applying the methodology of Appendix G to Section XI of the ASME Code.

Standard Review Plan (SRP) Section 5.3.2 provides an acceptable method of determining the pressure-temperature curves for ferritic materials in the beltline of the reactor pressure vessel (RPV) based on the linear elastic fracture mechanics (LEFM) methodology of Appendix G to Section XI of the ASME Code. The basic parameter of this methodology is the stress intensity factor  $K_I$  that is a function of the stress state and flaw configuration. Appendix G requires a safety factor of 2.0 on stress intensities resulting from reactor pressure during normal and transient operating conditions, and a safety factor of 1.5 for hydrostatic testing curves. The methods of Appendix G postulate the existence of a sharp surface flaw in the RPV that is perpendicular to the direction of the maximum stress. This flaw is postulated to have a depth that is equal to  $\frac{1}{4}$  thickness ( $\frac{1}{4}T$ ) of the RPV beltline thickness and a length equal to 1.5 times the RPV beltline thickness. The critical locations in the RPV beltline region for calculating heatup and cooldown pressure-temperature curves are the  $\frac{1}{4}T$  and  $\frac{3}{4}T$  thickness ( $\frac{3}{4}T$ ) locations, which correspond to the maximum depth of the postulated inside surface and outside surface defects, respectively.

The Appendix G ASME Code methodology requires that licensees determine the adjusted reference temperature (ART or adjusted  $RT_{NDT}$ ). ART is defined as the sum of the initial (unirradiated) reference temperature (initial  $RT_{NDT}$ ), the mean value of the adjustment in reference temperature caused by irradiation ( $\Delta RT_{NDT}$ ), and a margin (M) term.  $\Delta RT_{NDT}$  is a product of a chemistry factor and a fluence factor. The chemistry factor is dependent upon the amount of copper and nickel in the material and may be determined from the table in RG 1.99, Rev. 2, or from surveillance data. The fluence factor is dependent upon the neutron fluence at the maximum postulated flaw depth. The margin term is dependent upon whether the initial  $RT_{NDT}$  is a plant-specific or a generic value and whether the chemistry factor (CF) was determined using the tables in RG 1.99, Rev. 2, or surveillance data. The margin term is used to account for uncertainties in the values of the initial  $RT_{NDT}$ , the copper and nickel content, the fluence, and the calculational procedures. RG 1.99, Rev. 2, describes the methodology to be used in calculating the margin term and the initial  $RT_{NDT}$ .

#### 5.2.2 Design Basis (UFSAR)

UFSAR Section 1.6.1.3.2, "Reactor Vessel and Internals," provides a brief description of the reactor vessel and its internals and some of the parameters to which it was fabricated.

UFSAR Appendix M, "Reactor Pressure Vessel Design Report," provides information on the purchase specifications for the reactor vessel.

### 5.2.3 Approved Methodologies

The methodologies used to develop the current pressure-temperature curves are as discussed in 5.2.1, "Regulations," provided above. It is also discussed in the NRC's SER in support of issuing LA 197.

### 5.2.4 Analysis

Entergy used NRC approved codes and methodologies as described in above Section 5.2.1. The NRC reviewed and approved the Entergy analysis results in LA 197. However, due to the age of Pilgrim's fluence calculation a limit on the use of these curves through operating cycle 16 was imposed. The restriction was imposed to allow time to develop and submit new neutron transport calculations, and (if necessary) new pressure-temperature curves. The restriction was supported by the conservatism within the existing analysis and tributary inputs. Such conservatism resulted in a conservatism factor of approximately 2 when the restriction is applied to the 48 EPFY curves. The application allow operation for two additional cycles using the existing 48 EPFY curves results in a conservative margin in excess of 1.8.

### 5.2.5 Conclusions

The technical analysis performed by Entergy demonstrates that extending the use of the proposed pressure-temperature curves through the end of operating cycle 18 results in an increase in this margin of conservatism slightly in excess of 1.8 and this conservatism factor is sufficient to ensure reactor vessel integrity.

Entergy also concludes that approved methodologies were used, and that regulatory requirements continue to be met.

Therefore, based on the considerations discussed above, Entergy concludes that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

## 6. Environmental Consideration

The amendment changes a requirement with respect to use of a facility component located within the restricted area as defined in 10 CFR Part 20. Pilgrim has determined that the amendment involves no significant increases in the amounts, and no significant change in the types, of any effluents that may be released offsite, and there is no significant increase in individual or cumulative occupational radiation exposure. Pilgrim also finds that the proposed amendment involves no significant hazards consideration. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Hence, pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7. References

1. Entergy Letter No. 2.06.018, Proposed License Amendment to Change Technical Specification 3.6.A.2, Pressure-Temperature Limit Curves, dated April 12, 2006 (TAC MD1218)
2. Entergy Letter No. 2.06.090, Pilgrim Response to NRC Request for Additional Information Related to Proposed License Amendment to Change P-T Curves, dated October 16, 2006 (TAC MD1218)
3. Entergy Letter No. 2.06.099, Non-proprietary version of TransWare Report ENT-FLU 001-R-003, Rev. 0, Related to Proposed License Amendment to Change P-T Curves, dated December 8, 2006 (TAC MD1218)
4. Entergy Letter No. 1.01.038, Pilgrim Nuclear Power Station – Issuance of License Amendment 190, Pressure-Temperature Limit Curves (TAC No. MB0561), dated April 13, 2001.
5. Entergy Letter No. 2.00.080, Request for Technical Specification Change Concerning Pressure-temperature Limit Curves of Figures 3.6.1, 3.6.2, and 3.6.3, dated November 22, 2000.
6. Entergy Letter No. 2.01.015, "Modification of Technical Specification Change Submittal Concerning Pressure-Temperature Limit Curves," dated February 2, 2001.
7. SwRI Project No. 02-5951, "Pilgrim Nuclear Station Unit 1 Reactor Vessel Irradiation Surveillance Program," by E.B. Norris, Southwest Research Institute, July 1981.
8. MDE Report No. 277-1285, "Pilgrim Nuclear Power Station Reactor Pressure Vessel Fast Neutron Flux as A Function of Fuel Cycle," Revision 1, by L.S. Burns General Electric Company, Palo Alto, CA, November 27, 1985.
9. Entergy Letter No. 1.03.030, Pilgrim Nuclear Power Station – Issuance of License Amendment 197, Change to Applicability of Pressure-Temperature Curves (TAC No. MB5121), dated March 28, 2003.

## **ATTACHMENT 2**

**Letter Number 2.07.006**

### **PROPOSED TECHNICAL SPECIFICATIONS CHANGES (MARK-UP)**



207006 marked up  
TS pages.pdf

(8 pages)

This page is intentionally left blank.

Delete  
Page

This page is intentionally left blank.

Delete  
Page



This page is intentionally left blank.

Delete  
Page

This page is intentionally left blank.

Delete  
Page

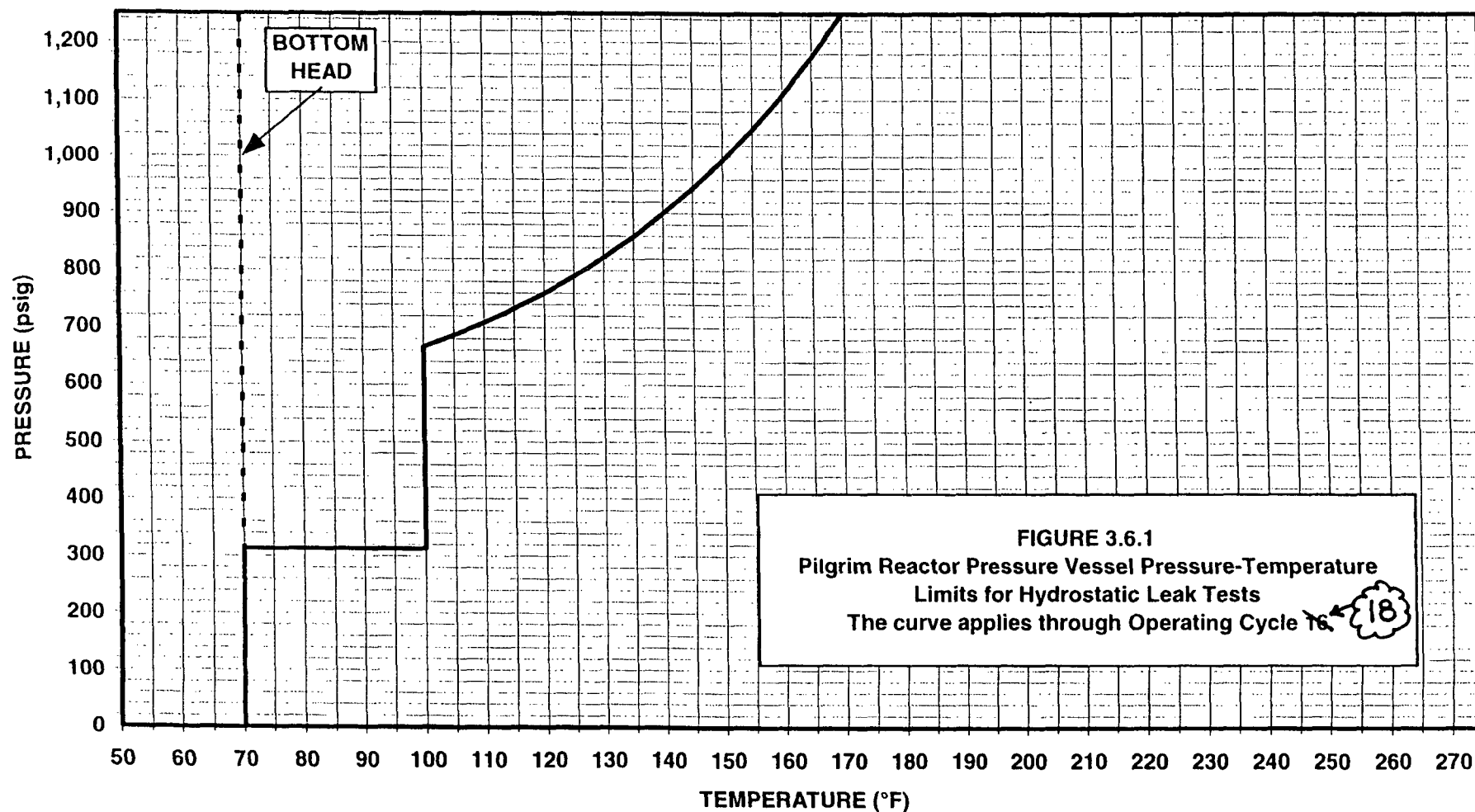
Amendment No. ~~20, 40, 60, 83~~, 195

~~3/4.6-12~~

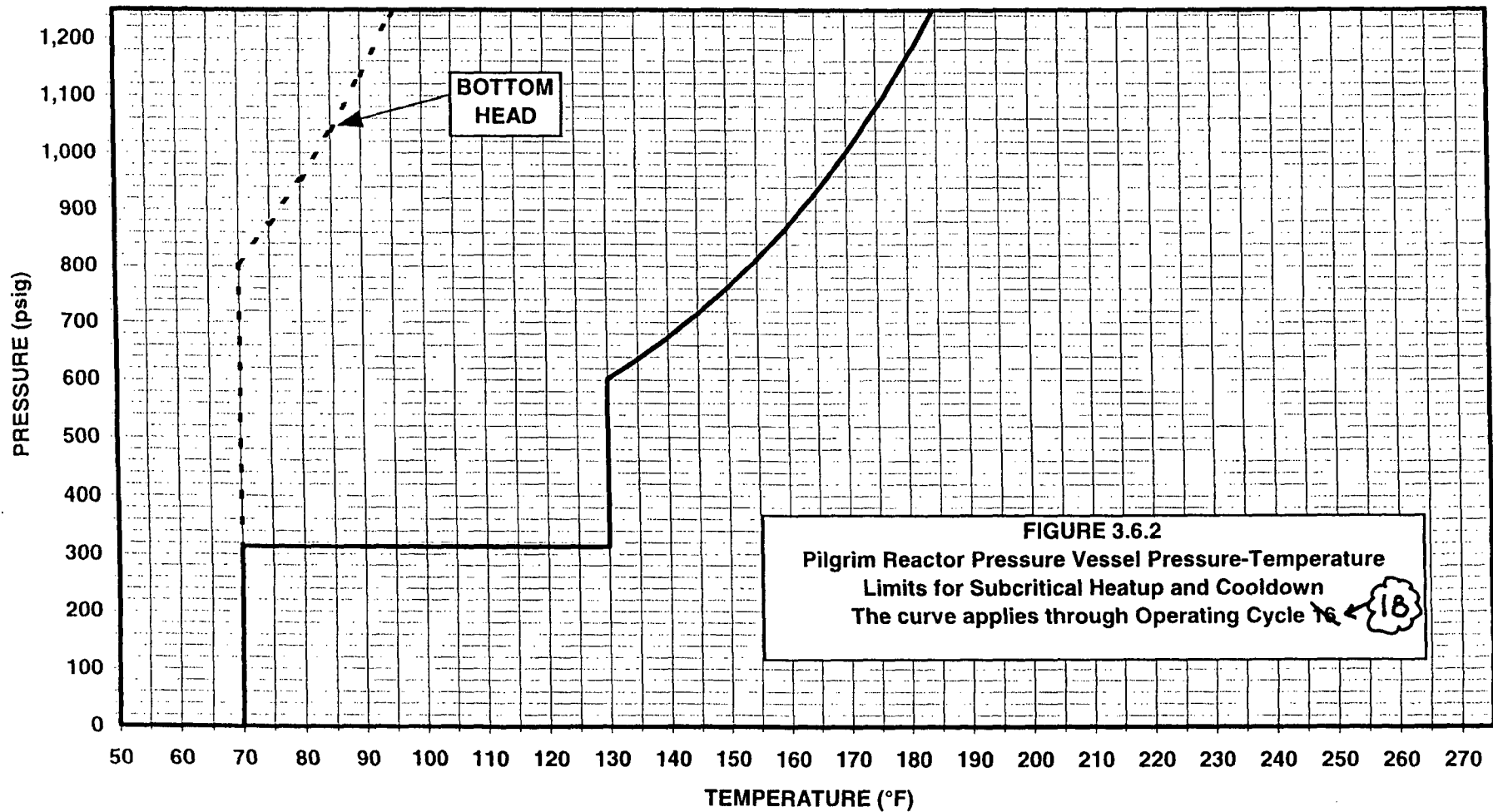
This page is intentionally left blank

Delete  
Page

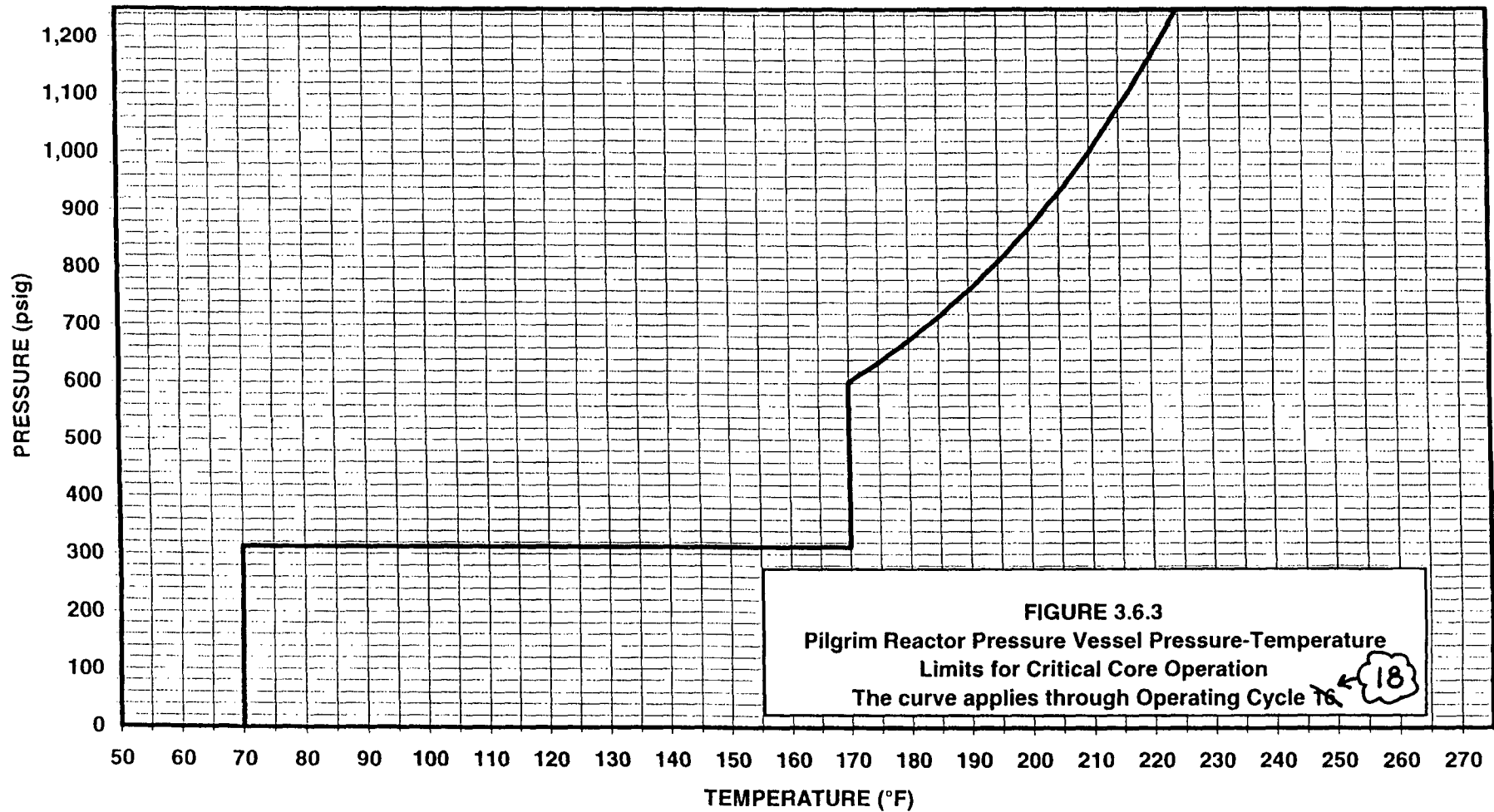
**PILGRIM REACTOR VESSEL PRESSURE-TEMPERATURE LIMITS**  
**HYDROSTATIC AND LEAK TESTS**



**PILGRIM REACTOR VESSEL PRESSURE-TEMPERATURE LIMITS**  
**SUBCRITICAL HEATUP AND COOLDOWN**



**PILGRIM REACTOR VESSEL PRESSURE-TEMPERATURE LIMITS**  
**CRITICAL CORE OPERATION**



### **ATTACHMENT 3**

#### **Letter Number 2.07.006**

#### **LIST OF REGULATORY COMMITMENTS**

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. Bryan Ford at (508) 830-8403.

<b>REGULATORY COMMITMENTS</b>	<b>DUE DATE</b>
Submit to the NRC an action plan to improve benchmarking data to support approval of new P-T curves for Pilgrim.	9/15/2007
Submit updated P-T curves for Pilgrim to the NRC for approval.	6/8/2010