



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

**William J. Riggs**  
Director, Nuclear Assessment

October 3, 2003

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. 50-293  
License No. DPR-35

Response to NRC Request for Additional Information

- REFERENCES:**
1. Entergy Letter No. 2.03.114, Pilgrim Relief Request No. 36, Alternative Contingency Repair Plan for Generic Letter 88-01, Reactor Pressure Vessel Nozzle-to-End Cap Weld, Using ASME Code Cases N-638 and N-504-2 with Exceptions, dated, October 1, 2003.
  2. Entergy Letter No. 2.03.115, Pilgrim Relief Request No. 37, Alternative Contingency Repair Plan for Generic Letter 88-01, Reactor Pressure Vessel Nozzle-to-Safe End Welds. Using ASME Code Cases N-638 and N-504-2 with Exceptions, dated, October 1, 2003.

**LETTER NUMBER:** 2.03.116

Dear Sir or Madam:

The attachment to this letter provides Pilgrim response to the NRC Request for Additional Information in support of PRR-36 (Reference 1) to repair RPV N10 Nozzle End Cap Weld. This response also supports PRR-37 (Reference 2) to the extent applicable to the contingency repair plan of RPV Core Spray Nozzle welds (N6A and B).

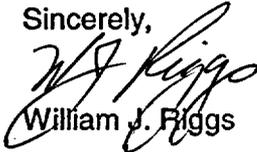
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Pilgrim Nuclear Power Station

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

Sincerely,



William J. Riggs

Attachment: Pilgrim Response to NRC Request for Additional Information (3 pages)

cc:

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Senior Resident Inspector  
Pilgrim Nuclear Power Station

## **ATTACHMENT**

### **Pilgrim Response to NRC Request for Additional Information**

#### **NRC QUESTION No. 1**

Use of American Society of Mechanical Engineers (ASME) Code Case N-504-2 requires that the weld reinforcement provide the necessary wall thickness to satisfy the flaw evaluation procedures of IWB-3640 from the 1983 Edition with the Winter Addenda, or later Editions and Addenda. The relief request does not address flaw evaluation or determination of the root cause of the cracking. Flaw characterization and evaluation is important due to the generic implications of this cracking. Discuss the flaw characterization and evaluation that will be used to support the development of the weld overlay.

#### **ENTERGY RESPONSE**

The subject flaw will be repaired using a standard overlay design as described in NUREG-0313, Rev. 2, Section 4.4.1. This design assumes a crack completely through the wall for 360°. The calculation methods for design of the overlay are in accordance with NUREG-0313, Section 4.1.

Investigations concerning the flaw and associated issues are continuing. Pilgrim will continue to provide information to the Staff as it becomes available. Additional information concerning the flaw will be provided as part of the Licensee Event Report

#### **NRC QUESTION No. 2**

Code Case N-504-2 requires hydrostatic testing of a repair if the flaw penetrated the original pressure boundary prior to welding. The relief request proposes to use ASME Code Case N-416-2 with the exception that the volumetric examination performed will be an ultrasonic examination of the weld overlay. The NRC approved Code Case N-416-2 in Regulatory Guide 1.147, with the condition that the hold times in IWA-5213 of the 1989 Edition of ASME Section XI be used. This would require a four-hour hold time of the insulated component after the repair. The relief request does not address this condition. Explain the proposal for a post repair pressure test in light of the conditional acceptance of Code Case N-416-2.

#### **ENTERGY RESPONSE**

In lieu of the system hydrostatic test required by Code Case N-504-2, Pilgrim has proposed to perform a system leakage test as allowed by Code Case N-416-2 with the additional condition that hold times specified in IWA-5213 (d) be observed. This complies with Regulatory Guide 1.147, Rev 13, relative to the NRC's conditional acceptance of Code Case N-416-2. The VT-2 inspections will be performed with the insulation removed from the locations where the proposed weld overlays are performed. This will allow a 10 minute hold before the VT-2 is performed. Insulation will be installed subsequent to the inspection.

**NRC QUESTION No. 3**

Clearly identify the non-destructive examination (NDE) techniques that will be used before and after the repair, the qualifications of those techniques, and how the techniques will or will not meet 10 CFR 50.55 (a) requirements.

**ENTERGY RESPONSE**

The examinations and acceptance criteria, as identified below, will be in accordance with ASME Code, Section III, 1992 Edition, Subsection NB for Class 1 Components, ASME Code Section XI, 1989 Edition, and Code Cases N-504-2 and N-638.

A description of the required examinations for the weld overlay repairs is provided in the following table.

Examination Description	Method	Technique	Reference
Weld and End Cap Overlay Surface Area Preparation Exam	PT	Visible Dye	N-504-2
First Two Weld Overlay Layers Surface Exam	PT	Visible Dye	N-504-2
First Two Weld Overlay Layers Thickness Measurements	UT or Mechanical	0° Long. UT or Mechanical Height Measurement	N-504-2
Completed Overlay Thickness Measurements	UT or Mechanical	0° Long. UT or Mechanical Height Measurement	N-504-2
Surface Exam of Final Overlay Surface and Adjacent Band within 1.5t (7/8" Band) of Weld Overlay. This also serves as Preservice Surface Examination of completed overlay.	PT	Visible Dye	NB-5350 IWB-3514 N-638 N-504-2
Volumetric Exam of Final Overlay and Adjacent Band within 1.5t (7/8" Band) of Weld Overlay. This also serves as Preservice Volumetric Examination of completed overlay.	UT	PDI procedure	ASME 1989, Section XI Appendix VIII
Preservice Baseline Exam of Final Overlay Outer 25% of the Underlying Pipe Wall to Identify the Original Flaws.	UT	60° Ref. Long. OD Creeping Wave	N-504-2

The acceptance criteria for the volumetric examinations shall be ASME Code Section XI Paragraph IWB-3514, "Standards for Examination Category B-F, Pressure Retaining Dissimilar Metal Welds, and Examination Category B-J, Pressure Retaining Welds in Piping".

It is noted that the curvature of reactor nozzle requires an exception to the ultrasonic inspection requirement for a 1.5t adjacent band volumetric examination at the end of the overlay on the nozzle end. The PT examination of this surface will constitute the acceptance testing for the overlay deposit.

Thickness will be characterized at four (4) azimuths representing each of the four (4) pipe quadrants. Thickness measurements may be determined using UT techniques or by mechanical measurement. Liquid penetrant examinations will be performed at the same stages of the overlay application as the thickness measurements identified above.