Entergy

Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043

January 31, 2008

CAL No. NRR-07-023

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

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Supplement to 60-Day Post-Outage report per CAL No. NRR-07-023 Pressurizer Butt Weld Inspection

Dear Sir or Madam:

On December 12, 2007, Entergy Nuclear Operations, Inc. (ENO) submitted the results of inspections conducted during the fall 2007 refueling outage at Palisades Nuclear Plant. All pressurizer dissimilar metal butt welds containing Alloy 600/82/182 were inspected to fulfill commitments made in letter dated February 27, 2007, and contained in Confirmatory Action Letter dated March 29, 2007. On December 19, 2007, in a telephone conference call between the Nuclear Regulatory Commission (NRC) and ENO, the NRC questioned statements in the December 12, 2007, submittal. An evaluation of the submittal and bases documentation identified that the information contained in Enclosure 1 to the December 12, 2007, letter needed to be revised. The overall conclusion in the December 12, 2007, letter has not been affected. Based on the results of the examinations, ENO has concluded that the Alloy 600/82/182 pressurizer butt welds were not degraded and no wastage of the pressurizer occurred.

Enclosure 1 provides additional information related to dissimilar metal butt welds that was discussed during the December 19, 2007, telephone call.

Enclosure 2 provides a revised description of the pressurizer butt weld inspection results. This Enclosure replaces Enclosure 1 from the December 12, 2007, letter. Changes in the document are identified by revision bars in the margins.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

Christopher J. Schwarz
Site Vice President
Palisades Nuclear Plant

Enclosures (2)

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE 1
ADDITIONAL INFORMATION RELATED TO DISSIMILAR METAL BUTT WELDS

On December 12, 2007, Entergy Nuclear Operations, Inc. (ENO) submitted the results of inspections conducted during the fall 2007 refueling outage at Palisades Nuclear Plant. All pressurizer dissimilar metal butt welds containing Alloy 600/82/182 were inspected to fulfill commitments made in letter dated February 27, 2007, and contained in Confirmatory Action Letter dated March 29, 2007. On December 19, 2007, in a telephone conference call between the Nuclear Regulatory Commission (NRC) and ENO, the NRC questioned statements in the December 12, 2007, submittal. An evaluation of the submittal and bases documentation identified that the information contained in Enclosure 1 to the December 12, 2007, letter needed to be revised. The overall conclusion in the December 12, 2007, letter has not been affected. Additional information related to visual examination of the pressurizer safety valve flange butt welds and spray line safe end butt welds and weld classification of the pressurizer safety valve flange butt welds is provided below.

- Evaluation of Visual Examination:

In Enclosure 1 of the December 12, 2007, letter, ENO stated that the three pressurizer safety valve flange butt welds and spray line safe end butt welds were visually examined. Rather, these welds were volumetrically examined. Visual examination of these welds was neither required, nor performed in the 2007 refueling outage because ENO conducted Performance Demonstration Initiative (PDI)-qualified volumetric ultrasonic examinations (UT). Industry guidance in "Materials Reliability Program [MRP]: Primary System Piping Butt Weld Inspection and Evaluation Guideline (MRP-139)," dated July 14, 2005, identifies that the visual examinations (Category J) examination requirement in Section 6.10.2 is for outages when volumetric examinations are not being performed. All required Category J examinations were performed. Enclosure 2 provides the corrected information.

In the 2007 refueling outage, bare metal surfaces of the pressurizer safety valve flange welds and spray line safe end butt welds were exposed for the UT examinations. The UT examiner was also qualified to perform visual exams but was not assigned to visually examine these welds. No visible or volumetric evidence of cracking or leakage was reported.

- Evaluation of Weld Classification:

The pressurizer safety valve mounting flange nozzle butt welds were conservatively classified as MRP-139 Category H at the time of examination during the fall 2007 refueling outage.

The subject welds did not clearly fit into any of the MRP-139 volumetric examination categories when they were classified. Only Categories D and H exist for volumetric examination of non-resistant material such as Alloy 600, that (a) has not cracked, (b) has not undergone stress improvement or weld overlay, and (c) operates at hot leg or pressurizer temperature.

Category D was designated for greater than or equal to 4-inch pipe size. The pressurizer safety valve mounting flange nozzles are nominally 3 inches, but the flange weld necks have unusually large outside diameters for 3-inch pipe. An argument could have been made that these welds did not require volumetric examination due to their nominal size; however, that was considered to not meet the intent of MRP-139.

Category H was the best category to ensure volumetric examination of safety valve flange welds. It captures susceptible high temperature welds that cannot meet certain volumetric inspection requirements. Category H examination frequency defaults to Category D "to the extent possible" and MRP-139, Section 5.1.7, imposes additional requirements for less than 90% coverage capability. The inspection met the Category D frequency requirement, and coverage was greater than 90%. Thus, Category D and H inspection requirements were satisfied.

After the welds were classified and inspected, the definition of Category D was revised. MRP Interim Guidance Letter MRP 2007-038, dated November 1, 2007, now includes 2-inch and larger pipe size butt welds, rather than 4-inch and larger as originally specified. Based upon the new interim guidance, the 3-inch pressurizer safety valve flange nozzle butt welds are now Category D, and have satisfied all associated examination requirements to date.

Enclosure 2 supersedes Enclosure 1 of the December 12, 2007, ENO letter.

ENCLOSURE 2
REVISED 60-DAY REPORT PER CAL NRR-07-023
PRESSURIZER BUTT WELD INSPECTION RESULTS

1.0 INTRODUCTION

On March 29, 2007, the Nuclear Regulatory Commission (NRC) issued CAL NRR-07-023, "Confirmatory Action Letter – Palisades Nuclear Plant (TAC No. MD4168)," confirming new and revised commitments made on February 27, 2007, by the Nuclear Management Company, LLC (NMC), former license holder for Palisades Nuclear Plant (PNP). The commitments addressed actions that would be taken regarding pressurizer dissimilar metal butt welds containing Alloy 82/182 material.

The PNP 2007 refueling outage began on September 9, 2007, and the plant was returned to operation on October 21, 2007. During the outage, Entergy Nuclear Operations, Inc. (ENO) conducted inspection of all pressurizer dissimilar metal butt welds containing Alloy 82/182 material in accordance with commitments and qualified procedures. Inspections included a combination of bare-metal and volumetric examinations. Thirteen butt weld piping connections containing Alloy 82/182 butt welds were examined. Based on the results of the examinations performed, ENO concluded that all Alloy 82/182 pressurizer butt welds that were returned to service, following the 2007 refueling outage, were not degraded, and no wastage of the pressurizer occurred.

2.0 DESCRIPTION OF INSPECTION METHODS

Bare metal, direct visual examinations were performed by qualified Consumers Energy personnel using qualified procedures to examine the eight butt-welded level taps and the surge line nozzle to safe end weld that had been mitigated by mechanical stress improvement (MSIP) in 1995.

Performance Demonstration Initiative (PDI) - qualified ultrasonic examinations were performed by qualified Consumers Energy personnel using qualified procedures. Inspections included examination from the outer diameter (OD) of the spray nozzle safe end and welds, and examinations from the inner and outer diameters (ID and OD) of the three Alloy 600 safety valve mounting flanges and nozzle butt welds.

3.0 COMMITMENTS AND RESULTS

In February 2007, NMC made a total of eight new and revised commitments for Palisades (referenced as PNP) regarding Alloy 82/182 pressurizer butt welds. The Palisades operating license has since been transferred to ENO. Commitments 1 through 4 apply to non-outage activities and terminate upon completion of the 2007

refueling outage. This report completes the requirements of Commitments 5 and 6. Only Commitments 7 and 8 will remain open.

All Alloy 600/82/182 pressurizer butt welds were examined during the 2007 refueling outage. There was no evidence of cracking or leakage.

Commitment 1:

NMC will determine unidentified leakage daily whenever the unit is in Mode 1, 2, or 3 steady state operations, until the completion of the 2007 refueling outage at PNP. NMC will implement this commitment no later than March 8, 2007. NMC will notify the NRC in writing, prior to making any changes to this commitment.

Results for Commitment 1:

On March 7, 2007, Revision 76 of Technical Specification Surveillance Procedure DWO-1, "Operator's Daily/Weekly Items, Modes 1, 2, 3, and 4," which incorporated this commitment, was issued. NMC and ENO determined unidentified leakage daily as required.

Commitment 1 ended upon completion of the 2007 refueling outage.

Commitment 2:

If the unidentified Primary Coolant System (PCS) leakage increases 0.1 gallons per minute (gpm) over the previous daily reading and is sustained for 72 hours, NMC will take action to be in Mode 3 within 6 hours and Mode 5 within 36 hours, and perform a bare metal visual examination of the Alloy 600/82/182 butt-weld locations, unless it can be confirmed the increase is not from these pressurizer welds, until the completion of the 2007 refueling outage at PNP. NMC will implement this commitment no later than March 8, 2007. NMC will notify the NRC in writing, prior to making any changes in this commitment.

Results for Commitment 2:

On March 7, 2007, NMC issued Revision 76 of Technical Specification Surveillance Procedure DWO-1, "Operator's Daily/Weekly Items, Modes 1, 2, 3, and 4", which incorporated this commitment.

Palisades did not enter the conditions that would have required pressurizer butt weld inspection under this commitment.

Commitment 2 ended upon completion of the 2007 refueling outage.

Commitment 3:

If unidentified PCS leakage increases 0.25 gpm above baseline (see item 4) and is sustained for 72 hours, NMC will take action to be in Mode 3 within 6 hours and Mode 5 within 36 hours, and perform a bare metal visual examination of the Alloy 600/82/182 butt-weld locations, unless it can be confirmed the increase is not from these pressurizer welds, until the completion of the 2007 refueling outage at PNP. NMC will implement this commitment no later than March 8, 2007. NMC will notify the NRC in writing, prior to making any changes in this commitment.

Results for Commitment 3:

On March 7, 2007, NMC issued Revision 76 of Technical Specification Surveillance Procedure DWO-1, "Operator's Daily/Weekly Items, Modes 1, 2, 3, and 4", which incorporated this commitment.

Palisades did not enter the conditions that would have required pressurizer butt weld inspection under this commitment.

Commitment 3 ended upon completion of the 2007 refueling outage.

Commitment 4:

NMC will determine the baseline PCS leakage rate from data obtained during the first 7 days of steady state operation at approximately 100% power, after the most recent bare metal visual examination of the Alloy 600/82/182 butt-welds, until the completion of the 2007 refueling outage at PNP. NMC will implement this commitment no later than March 8, 2007. NMC will notify the NRC in writing, prior to making any changes in this commitment.

Results for Commitment 4:

Prior to the 2007 refueling outage, the most recent bare metal visual examination of Alloy 600/82/182 pressurizer butt welds occurred during the 2006 refueling outage.

On March 7, 2007, NMC issued Revision 76 of Technical Specification Surveillance Procedure DWO-1, "Operator's Daily/Weekly Items, Modes 1, 2, 3, and 4", which incorporated a 7-day baseline leakage rate of 0.023 gpm in accordance with this commitment.

Commitment 4 ended upon completion of the 2007 refueling outage.

Commitment 5:

NMC will provide inspection results of any bare metal visual examinations performed as a result of these requirements to the NRC in a written report within 60 days of plant restart until the completion of the 2007 refueling outage at PNP. NMC will notify the NRC in writing, prior to making any changes to this commitment.

Results for Commitment 5:

Bare metal visual examinations of the eight butt-welded level taps and the surge line nozzle to safe end weld were performed during the 2007 refueling outage, although they were not required by Commitments 2 and 3. There was no accumulation of boric acid in the vicinity of the welds.

Commitment 5 ends upon submittal of this 60-day report.

Commitment 6:

NMC will complete inspections of the pressurizer Alloy 600/82/182 butt-welds at PNP during the 2007 refueling outage per the industry guidance, MRP-139 [Materials Reliability Program: Primary System Piping Butt Weld Inspection and Evaluation Guideline]. NMC will notify the NRC in writing, prior to making any changes to this Commitment.

Results for Commitment 6:

During the 2007 refueling outage, ENO conducted PDI-qualified ultrasonic testing (UT) examinations of pressurizer spray line welds in accordance with MRP-139 Category D, and pressurizer safety valve flanges and welds in accordance with MRP-139 Category H. ENO performed qualified bare metal visual examinations of pressurizer level tap welds in accordance with MRP-139 Category J for weldments less than 4" NPS at pressurizer temperatures.

ENO performed a qualified bare metal visual examination of the pressurizer surge nozzle to safe end weld that was mitigated with Mechanical Stress Improvement (MSIP) in 1995, in accordance with MRP-139 Category C. A separate commitment requires ENO to perform volumetric examination every two refueling cycles for Alloy 600 welds mitigated by MSIP. PDI-qualified UT examination of the pressurizer surge nozzle to safe end weld was performed during the 2006 refueling outage.

All inspections of pressurizer Alloy 600/82/182 butt welds have been completed in accordance with MRP-139. All examination results were acceptable.

Commitment 6 ended upon completion of the 2007 refueling outage.

Commitment 7:

NMC will inspect the Alloy 600/82/182 pressurizer butt-welds per MRP-139, on a frequency of at least every four years, until the Alloy 600/82/182 pressurizer butt-welds are mitigated or removed at PNP. NMC will notify the NRC in writing, prior to making any changes to this commitment.

Results for Commitment 7:

Alloy 600/82/182 pressurizer surge line butt welds were mitigated with Mechanical Stress Improvement (MSIP) in 1995. Alloy 600/82/182 power operated relief valve line butt welds were removed in 1995. All existing Alloy 600/82/182 pressurizer butt welds were examined in accordance with MRP-139 within the last two refueling outages (spring 2006 and fall 2007). The four-year frequency will not be exceeded for any affected weld by the next refueling outage, which is scheduled for spring 2009.

Commitment 7 is not changed.

Commitment 8:

NMC will provide results of future inspections, including inspections on unmitigated welds and any corrective or mitigative actions taken on the pressurizer surge, spray, safety, or relief nozzle and safe end welds containing Alloy 600/82/182 material, within 60 days of the end of the station refueling outage during which the inspection was performed, until the Alloy 600/82/182 pressurizer butt-welds are mitigated or removed at PNP. NMC will notify the NRC in writing, prior to making any changes to this commitment.

Results for Commitment 8:

Palisades returned to operation from its most recent refueling outage on October 21, 2007. This 60-day report describes inspections and their results for pressurizer surge, spray, safety, and relief nozzle and safe end welds containing Alloy 600/82/182 material. No corrective or mitigative actions were taken during the 2007 outage for these welds.

Commitment 8 is not changed.

4.0 CONCLUSIONS

ENO has complied with commitments described in CAL NRR-07-023 for the 2007 PNP refueling outage. Based on the results of the examinations performed during the refueling outage, ENO concluded that all Alloy 82/182 pressurizer butt welds that were returned to service were not degraded.