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PNP 2012-059

July 11, 2012

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

SUBJECT: 60-Day Reports per Bulletin 2004-01 and CAL No. NRR-07-023
Pressurizer Inspection Results for the 2012 Refueling Outage

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

- References:
1. NRC Bulletin 2004-01: *Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized-Water Reactors*, dated May 28, 2004 (ADAMS Accession Number ML041480034)
 2. Nuclear Management Company, LLC letter to the NRC, *60-Day Response to Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized-Water Reactors,"* dated July 26, 2004 (ADAMS Accession Number ML042100242)
 3. Nuclear Management Company, LLC letter to the NRC, *Supplement to Inspection and Mitigation of Alloy 600/82/182 Pressurizer Butt-Welds*, dated February 27, 2007 (ADAMS Accession Number ML070590333)
 4. CAL No. NRR-07-023: *Confirmatory Action Letter – Palisades Nuclear Plant (TAC No. MD4168)*, dated March 29, 2007 (ADAMS Accession Number ML070800449)

Dear Sir or Madam:

On May 28, 2004, the Nuclear Regulatory Commission (NRC) issued Bulletin 2004-01 (Reference 1). In a 60-day bulletin response letter (Reference 2), the Nuclear Management Company, LLC (NMC), former holder of the Palisades Nuclear Plant (PNP) operating license, made a series of commitments related to inspection of pressurizer penetrations.

On March 29, 2007, the NRC issued Confirmatory Action Letter, CAL No. NRR-07-023 (Reference 4), confirming the commitments made in Reference 3. The commitments

addressed actions that would be taken regarding pressurizer dissimilar metal butt-welds containing Alloy 82/182/600 material.

In June 2011, the NRC issued a revision to 10 CFR 50.55a, which required licensees to implement ASME Code Cases N-722-1, N-729-1, and N-770-1, with conditions. N-722-1 and N-770-1 encompass the earlier pressurizer inspection commitments made for PNP, except for the 60-day reporting requirement.

Entergy Nuclear Operations, Inc. (ENO) has assumed the commitments made by NMC for the refueling outage inspections of the pressurizer piping connections. During the 2012 refueling outage that ended on May 12, 2012, ENO inspected pressurizer heater sleeves, dissimilar metal butt-welds, and dissimilar metal pad welds containing Alloy 82/182/600 material in accordance with the commitments, qualified procedures, and 10 CFR 50.55a requirements. A total of 146 welds were examined: 120 heater sleeves, 14 butt-weld piping connections containing 24 Alloy 82/182/600 butt-welds requiring examination, and two pad repair welds. Based on the results of the examinations performed, ENO has concluded that all pressurizer heater sleeves, Alloy 82/182/600 pressurizer butt-welds, and pressurizer pad repair welds that were returned to service in 2012 were not degraded, and no wastage of the pressurizer occurred.

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 11, 2012.

Sincerely,



ajv/jlk

Attachment: 1. 60-Day Reports Per Bulletin 2004-01 and CAL No. NRR-07-023
Palisades Nuclear Plant Pressurizer Inspection Results for the 2012
Refueling Outage

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ATTACHMENT 1
60-DAY REPORTS PER BULLETIN 2004-01 AND CAL NO. NRR-07-023
PALISADES NUCLEAR PLANT PRESSURIZER INSPECTION RESULTS FOR
THE 2012 REFUELING OUTAGE

1.0 INTRODUCTION

On May 28, 2004, the Nuclear Regulatory Commission (NRC) issued Bulletin (BL) 2004-01, *Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized-Water Reactors*. In a 60-day response letter dated July 26, 2004, the Nuclear Management Company, LLC (NMC), former holder of the Palisades Nuclear Plant (PNP) operating license, made a series of commitments related to inspection of pressurizer penetrations.

On March 29, 2007, the NRC issued CAL No. NRR-07-023, *Confirmatory Action Letter - Palisades Nuclear Plant (TAC No. MD4168)*, confirming commitments made in a February 27, 2007, NMC letter, *Supplement to Inspection and Mitigation of Alloy 600/82/182 Pressurizer Butt-Welds*. The commitments addressed actions that would be taken regarding pressurizer dissimilar metal butt-welds containing Alloy 82/182/600 material.

In June 2011, the NRC issued a revision to 10 CFR 50.55a, which required licensees to implement ASME Code Cases N-722-1, N-729-1, and N-770-1, with conditions. N-722-1 and N-770-1 encompass the earlier pressurizer inspection commitments made for PNP, except for the 60-day reporting requirement.

Entergy Nuclear Operations, Inc. (ENO), as the PNP license holder, has assumed the commitments made by NMC for the refueling outage inspections of the pressurizer piping connections. In the 2012 refueling outage that ended on May 12, 2012, ENO inspected pressurizer heater sleeves and dissimilar metal butt-welds containing Alloy 82/182/600 material in accordance with commitments and qualified procedures. A total of 146 welds were examined: 120 heater sleeves, 14 butt-weld piping connections containing 24 Alloy 82/182/600 butt-welds requiring examination, and two pad repair welds.

2.0 DESCRIPTION OF INSPECTION METHODS

Performance Demonstration Initiative (PDI)-qualified phased array ultrasonic examinations were performed by qualified non-destructive examination (NDE) personnel using qualified procedures, to inspect one power operated relief valve (PORV) pipe to nozzle butt-weld, and two surge line safe end butt-welds to elbow and nozzle. Examinations were performed in accordance with ASME Code Case N-770-1 with conditions imposed by 10 CFR 50.55a. Code Case N-770-1 supersedes

examination requirements of MRP-139 and satisfies PNP commitments for volumetric examination of Alloy 600/82/182 pressurizer butt-welds.

Qualified NDE personnel performed bare metal direct visual examinations of 100% of all 120 unmitigated Alloy 82/182/600 pressurizer heater sleeves, 16 unmitigated one-inch level tap safe end butt-welds to piping and nozzles, three unmitigated safety valve flange to nozzle butt-welds, and two unmitigated spray line safe end butt-welds to piping and nozzle. Bare metal, direct visual NDE was also performed on two temperature element nozzle pad repair welds that had been repaired in 1993. Examinations were performed in accordance with ASME Code Cases N-722-1 and N-770-1 with conditions imposed by 10 CFR 50.55a. Code Cases N-722-1 and N-770-1 satisfy PNP commitments for visual examination of Alloy 600/82/182 pressurizer butt-welds.

3.0 COMMITMENTS AND RESULTS

In 2004, four commitments for PNP were made in response to Bulletin 2004-01. Three of the commitments remain open in 2012. ENO actions and results during the 2012 PNP refueling outage are described below for heater sleeve commitments one, two, and three. Commitment four was completed in 2006.

Additionally, in February 2007, six new and two revised commitments were made for PNP, in regard to Alloy 82/182/600 pressurizer butt-welds that were confirmed in CAL No. NRR-07-023. Of these eight commitments, commitments one through four do not apply to outage activities. Commitments five and six were completed during and following the 2007 PNP refueling outage. ENO actions and results during the 2012 PNP refueling outage are described below for commitments seven and eight.

Heater Commitment 1:

NMC [ENO] will perform a bare metal visual inspection of 100 percent of all pressurizer heater sleeve locations, in a manner that visual access to the bare metal 360 degrees around each sleeve can be attained during each outage at Palisades Nuclear Plant.

Results for Commitment 1:

During the 2012 refueling outage, bare metal visual examinations of all 120 pressurizer heater sleeves (J-groove welds) were performed. This examination included 360 degrees around each sleeve. There was no accumulation of boric acid in the vicinity of the penetrations. All visual examinations of the penetrations had acceptable results.

Heater Commitment 2:

NMC [ENO] will perform non-destructive examination (NDE) capable of characterizing crack orientation of all sleeves for which visual inspection shows evidence of leakage at Palisades Nuclear Plant. The NDE will be performed prior to any repairs.

Results for Commitment 2:

No action was required, because the visual examination did not show any evidence of leakage.

Heater Commitment 3:

NMC [ENO] will notify the NRC immediately if the NDE defines the flaw as potential circumferential primary water stress corrosion cracking (PWSCC) in either the pressure boundary or non-pressure boundary portions of any locations covered under the scope of BL 2004-01 for the PNP. An appropriate inspection plan will be developed, which will define additional sleeves to be inspected by NDE, sufficient to determine the extent of condition commensurate with the characterization of the flaw.

Results for Commitment 3:

No action was required, because the examinations did not show any evidence of leakage.

Butt-Weld Commitment 7:

NMC [ENO] will inspect the Alloy 82/182/600 pressurizer butt-welds per MRP-139, ("Materials Reliability Program: Primary System Piping Butt Weld Inspection and Evaluation Guidelines") on a frequency of at least every four years, until the Alloy 82/182/600 pressurizer butt-welds are mitigated or removed at PNP. NMC [ENO] will notify the NRC in writing, prior to making any changes to this commitment.

Results for Commitment 7:

All existing Alloy 82/182/600 pressurizer butt-welds were examined in accordance with MRP-139 within the last four years, during the spring 2009, fall 2010 and spring 2012 refueling outages.

Code Case N-770-1 imposes more stringent examination requirements than MRP-139. Essentially 100% of the required examination volume must be examined in both the axial and circumferential directions, and essentially 100% of susceptible material must be examined. Mitigated welds must be approved by the NRC before being placed into mitigated inspection categories. Additionally, susceptible material must be examined

even if it is not exposed to primary water conditions, if it is relied upon for structural integrity. The second condition brought the mitigated surge line safe-end to elbow weld into the population of welds requiring inspection every other refueling outage. The second and third conditions brought the PORV nozzle into the population of required inspections, because it includes Alloy 82/182 weld butter that is isolated from the primary water environment but is relied upon for structural integrity.

During the 2012 refueling outage, PDI-qualified phased array ultrasonic examinations were performed to inspect a PORV nozzle weld, unmitigated surge line safe end to nozzle butt-weld, and surge line safe end butt-weld to the piping elbow mitigated in 1995 by the Mechanical Stress Improvement Process (MSIP). Also, the welds were dye penetrant examined. The 2012 examination results indicated these butt-welds were not degraded.

- The PORV nozzle, which had not required inspection under MRP-139, was last volumetrically examined in 2004. Essentially 100% volumetric coverage could not be attained, and a Relief Request was granted during the outage to defer baseline N-770-1 inspection until the fall 2013 refueling outage.
- The surge line safe-end to nozzle butt-weld and the surge line safe end to the piping elbow butt-weld had previously received MRP-139 ultrasonic examinations during the 2009 PNP refueling outage. The surge line safe-end to nozzle butt-weld also had MRP-139 Category J visual examination during the 2007 and 2010 PNP refueling outages.

During the 2012 refueling outage, Code Case N-722-1 direct visual examinations were performed to inspect two unmitigated spray line safe end welds to nozzle and elbow, and three unmitigated welds attaching Alloy 600 safety valve flanges to pressurizer nozzles. The examination results indicated these welds were not degraded. These welds had previously received PDI-qualified ultrasonic examinations during the 2007 and 2010 PNP refueling outages, and MRP-139 Category J visual examinations during the 2009 PNP refueling outage. Code Case N-722-1 examinations also meet the MRP-139 and Code Case N-770-1 visual examination requirements.

There has been no change to the commitment.

Butt-Weld Commitment 8:

NMC [ENO] 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 82/182/600 material, within 60 days of the end of the station refueling outage during which the inspection was performed, until the Alloy 82/182/600 pressurizer butt-welds are mitigated or removed at PNP. NMC [ENO] will notify the NRC in writing, prior to making any changes to this commitment.

Results for Commitment 8:

During the 2012 refueling outage, other Alloy 82/182/600 pressurizer welds were examined as required by ASME Section XI Code Case N-722. Bare metal, direct visual examinations were performed on 16 unmitigated one-inch level tap safe end butt-welds to piping and nozzles, and on two temperature element nozzle pad repair welds that had been repaired in 1993. The examination results indicated the 16 butt-welds and two pad repair welds were not degraded. Similar examinations were performed during the 2007, 2009, and 2010 refueling outages.

There has been no change to the commitment.

4.0 CONCLUSIONS

PNP returned to operation from its most recent refueling outage on May 12, 2012. This 60-day report describes inspection results for the pressurizer surge, spray, safety and relief nozzle, safe end, heater sleeve, and temperature element nozzle repair welds containing Alloy 82/182/600 material.

ENO has complied with commitments described in Bulletin 2004-01 and CAL No. NRR-07-023, for the PNP 2012 refueling outage. Based on the results of the examinations performed, ENO has concluded that all pressurizer heater sleeves, Alloy 82/182/600 pressurizer butt-welds, and pressurizer pad repair welds that were returned to service in 2012 were not degraded, and no wastage of the pressurizer occurred.