



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 27, 2009

Mr. Michael D. Wadley
Site Vice President
Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2 – SUMMARY OF
STRESS ANALYSIS AND ULTRASONIC EXAMINATIONS FOR THE WELD
OVERLAY ON PRESSURIZER SURGE NOZZLE (TAC NO. MD9961)

Dear Mr. Wadley:

By letters dated October 16, 2008 (Agencywide Documents Access and Management System Accession Nos. ML082900808 and ML082900860), Northern States Power Company, a Minnesota corporation (the licensee), submitted a summary of the stress analysis and ultrasonic examinations of the weld overlay installed on the dissimilar and similar metal welds at the pressurizer surge line nozzle at Prairie Island Nuclear Generating Plant, Unit 2.

On the basis of its review of the information submitted, the U.S. Nuclear Regulatory Commission (NRC) staff concludes that the licensee has satisfactorily performed the stress analysis and ultrasonic examinations of the weld overlay, dissimilar metal weld, and similar metal weld at the pressurizer surge line nozzle. The NRC's review summary is enclosed.

Sincerely,

A handwritten signature in cursive script that reads "Thomas J. Wengert".

Thomas J. Wengert, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-306

Enclosure:
Review Summary

cc w/encl: Distribution via ListServ



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SUMMARY OF THE STRESS ANALYSIS AND ULTRASONIC EXAMINATIONS

OF THE WELD OVERLAY ON PRESSURIZER SURGE LINE NOZZLE

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2

NORTHERN STATES POWER COMPANY - MINNESOTA

DOCKET NUMBER 50-306

1.0 INTRODUCTION

By letters dated October 16, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML082900808 and ML082900860), Northern States Power Company (the licensee) submitted a summary of the stress analysis and ultrasonic examinations of the weld overlay installed on the dissimilar metal weld, W-17, and similar metal weld, W-16, on the pressurizer surge line nozzle at Prairie Island Nuclear Generating Plant (PINGP), Unit 2.

By letter dated June 25, 2007 (ADAMS Accession No. ML071760332), the licensee requested U.S. Nuclear Regulatory Commission (NRC) approval of Relief Request 2-RR-4-8, Revision 0, for PINGP Unit 2. Relief was requested to support PINGP's installation of a preemptive full structural weld overlay on the nozzle-to-safe end dissimilar metal weld and safe end-to-reducer stainless steel butt weld of the pressurizer surge line during the Unit 2 refueling outage (2R25) in 2008.

By letter dated January 15, 2008 (ADAMS Accession No. ML081510906), the licensee responded to NRC's request for additional information and submitted Relief Request 2-RR-4-8, Revision 1. In addition, in a letter dated May 7, 2008 (ADAMS Accession No. ML081280890), the licensee submitted an additional commitment regarding the inservice inspection requirements in the relief request.

By letter dated June 15, 2008 (ADAMS Accession No. ML081360646), the NRC authorized the use of Relief Request 2-RR-4-8, Revision 1. As part of the relief request, the licensee committed to submitting a stress analysis summary demonstrating that the pressurizer nozzle will perform its intended design functions after the preemptive full structural weld overlay installation. The licensee also committed to submit the results of the ultrasonic (UT) examinations of the dissimilar metal weld and similar metal weld. The stress analysis and UT results are discussed below.

Enclosure

2.0 DISCUSSION

2.1 Stress Analysis Results

The licensee's stress analysis summary shows that the weld overlay design satisfies the requirements of NB-3200 of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III. Subsection NB-3200 of the ASME Code, Section III, provides acceptance criteria for the stress analysis of piping components. The licensee evaluated the attached piping and verified that the full structural weld overlay would not adversely affect the surge line per NB-3200. Subsection NB-3600 of the ASME Code, Section III, applies to the piping attached to the nozzle. The licensee also evaluated the effects of weld shrinkage, additional nozzle weight, and increased stiffness at the joint per NB-3600. The full structural weld overlay was found to not have any significant impact on the attached piping or supports. Therefore, the weld overlay installation complies with Subsection NB-3600 of the ASME Code, Section III.

In addition to the stress analysis, the licensee also performed flaw growth calculations per Relief Request 2-RR-4-8. The licensee's flaw growth calculation showed that the depth of the worst case postulated flaw after 27 years of service is less than the allowable flaw depth per the ASME Code, Section XI acceptance criteria.

2.2 Ultrasonic Examination Results

As part of Relief Request 2-RR-4-8, the licensee committed to submit to the NRC within 14 days after the completion of the final PINGP Unit 2 pressurizer surge nozzle full structural weld overlay ultrasonic examination:

- (a) Weld overlay examination results including a list of indications detected,
- (b) Disposition of the indications using the standards of ASME Section XI, Nonmandatory Appendix Q,
- (c) The type and, if possible, nature of the indications, and
- (d) A discussion of any repairs to the weld overlay material and/or base metal and the reason for repairs.

After the weld overlay was installed during the refueling outage (2R25) in 2008, the licensee performed the UT of the Unit 2 pressurizer surge nozzle, which includes the nozzle-to-safe end dissimilar metal Alloy 82/182 butt weld (W-17), the safe end-to-reducer stainless steel butt weld (W-16) on the surge line connection to the pressurizer, and the new overlay weld (W-18). The examinations were performed using AREVA Procedure number 54-ISI-838, Revision 09, "Manual Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds". This procedure and personnel performing the examinations meet the qualification requirements of the Performance Demonstration Initiative per Relief Request 2-RR-4-8. The licensee

achieved 100 percent coverage on the required examination volume of the dissimilar metal weld (W-17) and similar metal weld (W-16). The licensee did not detect any indications in the weld overlay.

During installation of the weld overlay, the licensee identified an error in the recorded weld travel speeds. The licensee determined that actual travel speeds did not result in heat inputs outside the acceptable range. The licensee also identified that the first layer temperbead parameters were not used on a small area of the nozzle material nearest to the dissimilar metal weld. This was not in conformance with the ASME Code and resulted in the removal and rewelding of the affected area. The NRC staff finds that the affected area was removed and re-welded to meet the requirements of the ASME Code, Section XI, and NRC-approved Relief Request 2-RR-4-8 and, therefore, is acceptable.

3.0 CONCLUSION

On the basis of information submitted, the NRC staff finds that the licensee has demonstrated that stresses in the weld overlay and dissimilar metal weld on the pressurizer surge line nozzle satisfy the requirements of the ASME Code, Section III, NB-3200 and NB-3600. The flaw growth calculations show that the final depth for the postulated flaw is within the allowable size. The ultrasonic examinations of the weld overlay, dissimilar metal weld, and similar metal weld show that no indications are present. The NRC staff concludes that the licensee has fulfilled its commitments per NRC approved Relief Request 2-RR-4-8.

March 27, 2009

Mr. Michael D. Wadley
Site Vice President
Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2 – SUMMARY OF
STRESS ANALYSIS AND ULTRASONIC EXAMINATIONS FOR THE WELD
OVERLAY ON PRESSURIZER SURGE NOZZLE (TAC NO. MD9961)

Dear Mr. Wadley:

By letters dated October 16, 2008 (Agencywide Documents Access and Management System Accession Nos. ML082900808 and ML082900860), Northern States Power Company, a Minnesota corporation (the licensee), submitted a summary of the stress analysis and ultrasonic examinations of the weld overlay installed on the dissimilar and similar metal welds at the pressurizer surge line nozzle at Prairie Island Nuclear Generating Plant, Unit 2.

On the basis of its review of the information submitted, the U.S. Nuclear Regulatory Commission (NRC) staff concludes that the licensee has satisfactorily performed the stress analysis and ultrasonic examinations of the weld overlay, dissimilar metal weld, and similar metal weld at the pressurizer surge line nozzle. The NRC's review summary is enclosed.

Sincerely,
/RA/

Thomas J. Wengert, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-306

Enclosure:
Review Summary

cc w/encl: Distribution via ListServ

DISTRIBUTION:

PUBLIC LPL3-1 r/f RidsNrrDorLpl3-1 Resource JT sao, NRR
RidsNrrPMPrairieIsland Resource RidsNrrLABTully Resource RidsOgcRp Resource
RidsAcrcsAcnw_MailCTR Resource RidsNrrDciCpnb Resource RidsRgn3MailCenter Resource
ADAMS Accession No.: ML090790212

OFFICE	NRR/LPL3-1/PM	NRR/LPL3-1/LA	NRR/DCI/CPNB/BC	NRR/LPL3-1/BC
NAME	TWengert	BTully	TChan	LJames
DATE	03/24/09	03/24/09	03/26/09	03/27/09

OFFICIAL RECORD COPY