



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

November 17, 2009

MEMORANDUM TO: Nancy L. Salgado, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: Nadiyah S. Morgan, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

A handwritten signature in black ink, appearing to be "Nadiyah S. Morgan", written over a horizontal line.

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NO. 2 – VERBAL
AUTHORIZATION OF AN ALTERNATIVE WELD REPAIR METHOD
FOR REACTOR VESSEL HEAD PENETRATION J-GROOVE WELD
(TAC NO. ME2608)

By letter dated November 14, 2009, FirstEnergy Nuclear Operating Company (licensee) submitted to the US Nuclear Regulatory Commission (NRC) a relief request for authorization of a proposed alternative to repair defects in the reactor pressure vessel head penetration nozzles and associated J-groove welds for Beaver Valley Power Station, Unit No. 2 (BVPS-2) to be implemented during the ongoing maintenance and refueling outage. Specifically, the licensee updated a previous almost identical relief request dated October 9, 2008 (ADAMS Accession No. ML082900209) that had been authorized by the NRC by letter dated October 6, 2009 (ADAMS Accession No. ML092700031). The only change beyond the approved version of the relief request was that the licensee requested to utilize the surface non-destructive examination acceptance criteria of the original construction code versus the previously approved acceptance criteria of no surface indications for the imbedded flaw weld overlay repair technique for the remainder of the BVPS-2 third 10-year inservice inspection interval, scheduled to end in August 2018.

The need for the emergent relief request and requested quick review and approval by the NRC was due to ongoing work during the current refueling outage at BVPS-2. Two reactor pressure vessel head penetration nozzles and their associated J-groove welds were found to have primary water stress corrosion cracking (PWSCC) which required repair this refueling outage. The licensee implemented an imbedded flaw weld overlay technique in accordance with their previous relief request that essentially isolates the PWSCC susceptible material, alloy 600 and its weld materials alloy 182/82, from primary coolant with multiple layers of highly PWSCC resistant weld material Alloy 52. Upon completion of the repair, the licensee encountered difficulties in meeting the surface examination acceptance criteria of the original relief request. Significant rework and reinspection in a high radiation area caused the licensee to accumulate radiological dose well beyond the predicted values for these repairs. At the time of the relief request, the licensee expected to spend an additional 20 REM to meet the full acceptance criteria of the previous relief request. During a teleconference between the licensee and NRC staff on November 15, 2009, the licensee noted that they had been able to achieve the previous relief request's acceptance criteria on all portions of the exposed alloy 52 weld used in the repair except for a small section of the repair weld on penetration 57 over a stainless steel material that was also highly resistant to PWSCC on the reactor vessel head. This portion of

the repair weld was used to ensure overlap onto the non-susceptible material. The licensee made an assertion that the surface condition of the alloy 52 material covering the stainless steel was not as critical as the alloy 52 material covering the flaw and the PWSCC susceptible material of a penetration and associated J-groove weld. Further, the acceptance criteria of the construction code for BVPS-2 should be sufficient for the alloy 52 material over the stainless steel to ensure structural integrity.

The NRC staff reviewed the licensee's request and found that the licensee's information provided a sufficient technical basis to determine that compliance with the current requirements of the previous relief request would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety for that limited section of the penetration nozzle number 57 repair weld over the stainless steel. Therefore, on November 15, 2009, via teleconference, John Tsao (Piping and NDE Acting Branch Chief) recommended authorization and you verbally concurred to authorize the proposed alternative, which allows the licensee to use the surface non-destructive examination acceptance criteria of the construction code, in lieu of the previous requirement of no indications, for the alloy 52 repair weld material over the stainless steel cladding only for penetration nozzle number 57 for one cycle of operation, in accordance with Section 50.55a(a)(3)(ii) of Part 50 of Title 10 of the *Code of Federal Regulations*.

During the teleconference, the NRC staff requested that a copy of the licensee's root cause analysis report of the difficulties encountered in meeting the surface examination acceptance criteria be made available, once completed. The NRC staff will issue a final written authorization documenting the staff safety evaluation for this relief.

If you have any questions or concerns, please contact me at (301) 415-1016.

Sincerely,



Nadiyah S. Morgan, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-412

cc: Distribution via Listserv

the repair weld was used to ensure overlap onto the non-susceptible material. The licensee made an assertion that the surface condition of the alloy 52 material covering the stainless steel was not as critical as the alloy 52 material covering the flaw and the PWSCC susceptible material of a penetration and associated J-groove weld. Further, the acceptance criteria of the construction code for BVPS-2 should be sufficient for the alloy 52 material over the stainless steel to ensure structural integrity.

The NRC staff reviewed the licensee's request and found that the licensee's information provided a sufficient technical basis to determine that compliance with the current requirements of the previous relief request would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety for that limited section of the penetration nozzle number 57 repair weld over the stainless steel. Therefore, on November 15, 2009, via teleconference, John Tsao (Piping and NDE Acting Branch Chief) recommended authorization and you verbally concurred to authorize the proposed alternative, which allows the licensee to use the surface non-destructive examination acceptance criteria of the construction code, in lieu of the previous requirement of no indications, for the alloy 52 repair weld material over the stainless steel cladding only for penetration nozzle number 57 for one cycle of operation, in accordance with Section 50.55a(a)(3)(ii) of Part 50 of Title 10 of the *Code of Federal Regulations*.

During the teleconference, the NRC staff requested that a copy of the licensee's root cause analysis report of the difficulties encountered in meeting the surface examination acceptance criteria be made available, once completed. The NRC staff will issue a final written authorization documenting the staff safety evaluation for this relief.

If you have any questions or concerns, please contact me at (301) 415-1016.

Sincerely,
/RA/

Nadiyah S. Morgan, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-412
cc: Distribution via Listserv

DISTRIBUTION:

PUBLIC	RidsNrrLASLittle	RidsAcrcsAcnw_MailCTR
LPL1-1 Reading File	RidsNrrPMBeaverValley	RidsOGCRp
RidsNrrDorlLp1-1	RidsNrrDciCpnb	RidsRgn1MailCenter
RidsNrrDorlDpr	DWerkheiser, R1	DSpindler, R1
RBellamy, R1	JCollins	JTsao
SBarber, R1	PKaufmann, R1	JWhite, R1

Adams Accession No: ML093210282

OFFICE	LPL1-1/PM	LPL1-1/LA	CPNB/Reviewer	LPL1-1/BC
NAME	NMorgan	SLittle BClayton for	JCollins	NSalgado DPickett for
DATE	11/17/09	11/16/09	11/17/09	11/17/09