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Fax: 724-643-8069December 4, 2012
L-12-433

10 CFR 50.73

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001SUBJECT:
Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
LER 2012-002-00

Enclosed is Licensee Event Report (LER) 2012-002-00, "Unacceptable Indication Identified During Reactor Vessel Head Inspection." This event is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(A).

There are no regulatory commitments contained in this submittal. Any actions discussed in this document that represent intended or planned actions are described for the NRC's information, and are not regulatory commitments.

If there are any questions or if additional information is required, please contact Mr. Darin M. Benyak, Manager, Regulatory Compliance at 724-682-4284.

Sincerely,


Paul A. Harden

Enclosure – BVPS Unit 2 LER 2012-002-00

cc: Mr. W. M. Dean, NRC Region I Administrator
Mr. D. I. Spindler, NRC Senior Resident Inspector
Mr. P. J. Bamford, NRR Project Manager
INPO Records Center (via INPO Consolidated Event System)
Mr. L. E. Ryan (BRP/DEP)IE22
NIR2

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

Beaver Valley Power Station Unit Number 2

2. DOCKET NUMBER

05000412

3. PAGE

1 OF 3

4. TITLE

Unacceptable Indication Identified During Reactor Vessel Head Inspection

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	06	2012	2012	- 002 - 00		12	04	12	None	
									FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
6	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☒ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A	

10. POWER LEVEL	
000	

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

Darin M. Benyak Manager, Regulatory Compliance

TELEPHONE NUMBER (Include Area Code)

724-682-4284

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	AB	RPV	W120	Y					

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On October 6, 2012, during the Beaver Valley Power Station, Unit No. 2 (BVPS-2) refueling outage (2R16), the results of planned ultrasonic examinations performed on Penetration No. 44 of the reactor vessel head did not meet the applicable acceptance criteria. The indication was not through wall as there was no evidence of leakage at this penetration based on inspections performed on top of the reactor vessel head. The reactor vessel head examinations were being performed to meet the requirements of 10 CFR 50.55a(g)(6)(ii)(D) for reactor vessel head inspections to find potential flaws/indications well before the structural integrity of the reactor vessel head pressure boundary is significantly challenged. Indications that cannot be dispositioned as acceptable per ASME Code Section XI in a Reactor Coolant System pressure boundary are reportable under 10 CFR 50.72(b)(3)(ii)(A) / 50.73(a)(2)(ii)(A) as a condition of the nuclear power plant, including its principal safety barriers, being degraded.

Primary Water Stress Corrosion Cracking (PWSCC) of the Alloy 600 J groove weld was determined to be the apparent cause of the identified flaw. Reactor head Penetration No. 44 was repaired in accordance with the applicable embedded flaw repair methodology which was approved by the Nuclear Regulatory Commission for use at BVPS-2. The safety significance of this indication was very low.

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Energy Industry Identification System (EIS) codes are identified in the text as [XX]. CONDITIONS PRIOR TO OCCURRENCE Unit 2: Mode 6, Refueling. There were no systems, structures, or components that were inoperable at the start of the event that contributed to the event. DESCRIPTION OF EVENT On October 6, 2012, during the Beaver Valley Power Station, Unit No. 2 (BVPS-2) refueling outage (2R16), the results of planned ultrasonic examinations performed on Penetration No. 44 of the reactor vessel head [AB] did not meet the applicable acceptance criteria. The indication was not through wall as there was no evidence of leakage at this penetration based on inspections performed on top of the reactor vessel head. The examinations were being performed to meet the requirements of 10 CFR 50.55a(g)(6)(ii)(D) for reactor vessel head inspections to find potential flaws/indications well before the structural integrity of the reactor vessel head pressure boundary is significantly challenged. The ultrasonic examination of Penetration No. 44 identified an indication as having a primary water stress corrosion cracking (PWSCC) flaw located at the top of the J groove weld at the 346.5 degree location. The flaw was in the axial direction with a length of 0.28 inches. A liquid penetrant examination was also performed to determine if this indication was open to the surface. The liquid penetrant examination identified a 0.5 inch long by 0.0625 inch wide linear indication at the 340 degree location of the penetration and confirmed that the indication was open to the surface. The reactor vessel head examination is a requirement of 10 CFR 50.55a(g)(6)(ii)(D) which invokes ASME Code Case N-729-1. Ultrasonic examinations are performed on each of the 66 vessel head penetrations on the BVPS-2 head during each refueling outage until head replacement activities are completed in the future. Head Penetration No. 44 was repaired as required prior to plant startup from the 2R16 refueling outage. Indications that cannot be dispositioned as acceptable per ASME Code Section XI in a Reactor Coolant System (RCS) pressure boundary are reportable under 10CFR 50.72(b)(3)(ii)(A) / 50.73(a)(2)(ii)(A) as a condition of the nuclear power plant, including its principal safety barriers, being degraded. The indication found on Penetration No. 44 was reported to the Nuclear Regulatory Commission (NRC) per 10 CFR 50.72 on October 6, 2012 (EN Number 48387). Liquid penetrant examination also revealed two recordable indications on previous weld overlay repairs on Penetrations No. 16 and 57 which were not within the RCS pressure boundary material. Each was a rounded indication on a weld overlay greater than 0.1875 inch. Rounded indications of greater than 0.1875 inch must be remediated per the NRC approved relief request for BVPS-2. The indication on Penetration No. 57 was removed by buffing. The indication on Penetration No. 16 was removed by grinding and weld material was applied to restore the seal weld thickness. These penetrations were then found acceptable in accordance with the applicable ASME code criteria.					

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NARRATIVE

CAUSE OF EVENT

Primary Water Stress Corrosion Cracking (PWSCC) of the Alloy 600 J groove weld was determined to be the apparent cause of the identified flaw. The failure mechanism is a known issue that is addressed by the requirements of 10 CFR 50.55a(g)(6)(ii)(D). The repair to Penetration No. 44 utilized an embedded flaw weld overlay to encapsulate the surface attached flaw with an Alloy 690 material. A weld overlay of PWSCC resistant material to isolate the indication from the borated water environment arrests any further PWSCC on the penetration. The embedded flaw weld overlay methodology was previously approved by the NRC for use at BVPS-2.

ANALYSIS OF EVENT

The safety significance associated with the BVPS-2 reactor vessel upper head penetration indication found on Penetration No. 44 during the 2R16 refueling outage inspection is considered to be very low. This is based on the estimated conditional core damage probability (CCDP) and conditional large early release probability (CLERP) for the event. For this analysis, since the indication was not through wall and there was no evidence of RCS leakage, a 5 percent probability that the weld flaws could have propagated and resulted in a reactor vessel head penetration Loss of Coolant Accident (LOCA) was conservatively assumed.

CORRECTIVE ACTIONS

1. Reactor head Penetration No. 44 was repaired in accordance with the applicable embedded flaw repair methodology approved by the NRC for use at BVPS-2.

Planning is ongoing for a reactor vessel head replacement which is expected to occur during a future outage at BVPS-2.

PREVIOUS SIMILAR EVENTS

Similar reactor vessel head indications were found and repaired during the previous BVPS-2 refueling outages in 2009, 2008, and 2006. The BVPS-2 reactor vessel head is an original component. BVPS Unit 1 replaced its reactor vessel head in 2006.

CR 2012-15729