

Paul A. Harden
Site Vice President724-682-5234
Fax: 724-643-8069

November 25, 2009

L-09-321

10 CFR 50.73

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001**SUBJECT:**Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
LER 2009-004-01

Attached is Licensee Event Report (LER) 2009-004-01, "Two Ultrasonic Indications Found in Reactor Coolant System Drain Pipe." This event was previously reported in accordance with 10 CFR 50.73(a)(2)(ii)(A) on June 19, 2009. This supplement updates the cause information for this event.

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. Colin P. Keller, Manager, Regulatory Compliance at 724-682-4284.

Sincerely,


Paul A. Harden

Attachment

cc: Mr. S. J. Collins, NRC Region I Administrator
Mr. D. L. Werkheiser, NRC Senior Resident Inspector
Ms. N. S. Morgan, NRR Project Manager
INPO Records Center (via electronic image)
Mr. L. E. Ryan (BRP/DEP)

IE22
NRR

NRC FORM 366 (9-2007)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104		EXPIRES 08/31/2010																																								
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 5px 0;">(See reverse for required number of digits/characters for each block)</p>										Estimated burden per response to comply with this mandatory collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 1					2. DOCKET NUMBER 05000334			3. PAGE 1 of 4																																							
4. TITLE Two Ultrasonic Indications Found in Reactor Coolant System Drain Pipe																																															
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																																				
04	26	2009	2009	- 004	- 01	11	25	2009	None																																						
									FACILITY NAME		DOCKET NUMBER																																				
9. OPERATING MODE <div style="text-align: center; font-size: 1.2em;">6</div>			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: <i>(Check all that apply)</i> <table style="width: 100%; font-size: 0.8em;"> <tr> <td><input type="checkbox"/> 20.2201(b)</td> <td><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td style="font-size: 0.7em;">Specify in Abstract below or in NRC Form 366A</td> </tr> </table>									<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)																																												
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)																																												
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)																																												
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)																																												
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)																																												
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)																																												
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)																																												
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER																																												
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A																																												
10. POWER LEVEL <div style="text-align: center; font-size: 1.2em;">0 %</div>																																															
12. LICENSEE CONTACT FOR THIS LER																																															
FACILITY NAME Colin P. Keller, Manager, Regulatory Compliance									TELEPHONE NUMBER <i>(Include Area Code)</i> (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	P	W120	Yes																																											
14. SUPPLEMENTAL REPORT EXPECTED						15. EXPECTED SUBMISSION DATE			MONTH	DAY	YEAR																																				
<input type="checkbox"/> YES <i>(If yes, complete EXPECTED SUBMISSION DATE).</i>						<input checked="" type="checkbox"/> NO																																									
ABSTRACT <i>(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)</i> <p style="margin-top: 20px;"> During the Beaver Valley refueling outage, while performing planned ultrasonic examination of reactor coolant piping in accordance with Materials Reliability Project document MRP-146 "Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines", two relevant indications were found in a Reactor Coolant System 2-inch pipe segment which is a stainless steel drain/sample line off of the "A" hot leg on April 26, 2009. This is reportable pursuant to 10 CFR 50.73(a)(2)(ii)(A). There was no indication of through-wall leakage. This pipe segment was replaced. </p> <p style="margin-top: 20px;"> The most primary cause of the two identified cracks was determined to be fatigue. This event is considered to have very low risk significance. </p>																																															

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Beaver Valley Power Station Unit Number 1	05000334	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 4
		2009	-- 004	-- 01	

NARRATIVE

There were no structures, components, or systems that were inoperable at the start of the event that contributed to the event. Energy Industry Identification System (EIS) codes are identified in the text as [XX].

DESCRIPTION OF EVENT

On April 26, 2009 with Beaver Valley Power Station (BVPS) Unit No. 1 in a refueling outage, planned ultrasonic examinations were being performed on the Reactor Coolant System (RCS) [AB] piping per the recommendations of Materials Reliability Project (MRP) MRP-146, "Materials Reliability Program Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines." Two relevant indications were found in the horizontal portion of pipe segment BV-RC-41 which is a two inch drain/sample line that connects to the "A" RCS Hot Leg. An engineering evaluation of the indications conservatively concluded that these indications would not meet the American Society of Mechanical Engineers (ASME) Code because the ultrasonic technique was not qualified for sizing the flaws.

ANALYSIS OF EVENT

Two relevant indications were found in one 2-inch Nominal Pipe Size (NPS) pipe segment (located just downstream of a socket-welded elbow) which is a normally stagnant non-isolable branch line off of the Reactor Coolant System. No indications were found in the two similar drain lines off of the other two RCS hot legs.

RCS Leg

Drain Line

..... Location of two indications..

Since these two identified material defects could not be determined as acceptable in accordance with ASME Section XI, IWB-3600, "Analytical Evaluation of Flaws" or ASME Section XI, Table IWG-3410-1, "Acceptance Standards", this is described in NUREG-1022, Revision 2, "Event Reporting Guidelines" as reportable pursuant to 10 CFR 50.73(a)(2)(ii)(A) for a degradation of a principal safety barrier. This event was reported as a degraded condition of a principal safety barrier pursuant to 10 CFR 50.72(b)(3)(ii)(A) at 1336 on April 26, 2009 (EN Number 45022).

There was no loss of safety function pursuant to 10 CFR 50.73(a)(2)(v) since the Reactor Coolant System integrity was not lost.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Beaver Valley Power Station Unit Number 1	05000334	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 4
		2009	-- 004	-- 01	

NARRATIVE

Thirteen BVPS Unit 1 locations recommended pursuant to MRP-146 criteria were inspected during its refueling outage, which included the three RCS loop drain lines.

The identified indications were not through-wall and there was no evidence of leakage. The plant risk associated with the BVPS Unit 1 RCS piping indications found in 2-inch line RC-41 on April 26, 2009, is considered to be very low. Industry Operating Experience supports the assumption that a small leak would develop long before a rupture of the 2-inch pipe would occur. Since the small leakage would be within the capacity of one charging pump, it would result in a normal plant shutdown and cooldown, and would not be risk significant. Moreover, a bounding analysis based on the Conditional Core Damage Probability from a postulated unisolable 2-inch pipe rupture resulting in a reactor trip and safety injection signal was analyzed and determined to be of very low risk significance.

Based on the above, and the fact that there was no indication of through wall leakage, this event is considered to have very low risk significance.

CAUSE OF EVENT

A comprehensive destructive metallurgical evaluation on a ten-inch length of the subject piping segment was performed by Westinghouse in order to further understand the causes of the two identified ultrasonic examination indications. Both initially identified indications were oriented circumferentially, located at the bottom inner diameter of the two-inch NPS Type 316 stainless steel hot leg drain line. The indications were located approximately 3/4-inch from the toe of a socket weld and stagnant conditions were typically present in this section of piping. In addition to the laboratory analysis, the location, use and history of this pipe segment were factored into the final conclusions.

A total of 14 cracks (six axial and eight circumferential - one major and seven minor) were identified during the laboratory investigation. No additional indications were observed in the remaining portion of the ten-inch long section of the pipe. The axial cracks, although mostly superficial in depth, did have two cracks which penetrated up to approximately 30 percent of the pipe wall; one showed significant branching, and neither displayed striations. The circumferential cracks, which penetrated up to 50 percent of the pipe wall, showed striations in the major indication. Transgranular cracking was observed in both the axial and circumferential cracks.

These cracks were affected by multiple overlying factors, which included numerous thermal and mechanical stress fatigue considerations, as well as stress corrosion and corrosion-initiated fatigue influences. However, the most primary cause of the two identified cracks was determined to be fatigue, given their location and history. Stress

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Beaver Valley Power Station Unit Number 1	05000334	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 4
		2009	-- 004	-- 01	

NARRATIVE

corrosion cracking was a contributing secondary factor in at least some of the cracks.

The final comprehensive evaluation did not indicate that there were other susceptible locations at BVPS Unit 1 beyond those areas previously inspected during the last refueling outage pursuant to MRP-146. Eleven UT examinations were completed at BVPS Unit 2 pursuant to MRP-146 during its Fall 2009 refueling outage with no indications found. No additional examination areas are planned at Unit 2 as a result of the Unit 1 comprehensive metallurgical evaluation.

CORRECTIVE ACTIONS

1. The affected pipe segment was replaced which meets the ASME Section XI repair criteria.
2. The affected pipe segment was sent for metallurgical examination to validate the failure mechanism probable cause.
3. An Operating Experience report was issued describing this event and the results of the final evaluation.
4. Additional Ultrasonic Examinations (UT) will be performed in the future on the two-inch NPS replacement drain pipe (RC-41), the location where the two indications were originally found.

Completion of the above and other corrective actions are being tracked through the BVPS corrective action program.

PREVIOUS SIMILAR EVENTS

A review found no prior BVPS Unit No. 1 and BVPS Unit No. 2 Licensee Event Reports within the last three years for an event involving base metal material indications or flaws in the Reactor Coolant System piping.

CR 09-58004