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January 7, 1993
ND3MNO:3394

Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, Licensee No. DPR-66
LER 91-019-02

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

In accordance with Appendix A, Beaver Valley Technical Specifications, the following revised Licensee Event Report is submitted:

LER 91-019-02, 10 CFR 50.73.a.2.i.A and 10 CFR 50.73.a.2.i.B "Missed Weld Examinations Determined After Mode Escalation Resulting in Plant Shutdown".

This Licensee Event Report was previously issued with an incorrect revision number.

Very truly yours,

L. R. Freeland
General Manager
Nuclear Operations

JGT/sl

Attachment

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PDR ADOCK 05000334
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January 7, 1993
ND3MNO:3394
Page 2

cc: Mr. T. T. Martin, Regional Administrator
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January 7, 1993
ND3MNO:3394
Page 3

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3156-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

PAGE 15

0	5	0	0	0	3	3	4	1	OF	0	7
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Missed Weld Examinations Determined After Mode Escalations Resulting in Plant Shutdown

LICENSEE CONTACT FOR THIS LEA (12)

TEL: 01273 593000 FAX: 01273 593001

AREA CODE

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

SUPPLEMENTAL REPORT EXPECTED 11/4/01

EXPERIMENTAL
SUBMISSION
DATE: 11/11/11

MONTH	DAY	YEAR
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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YES (If yes, complete EXPECTED SUBMISSION DATE)

☒ NO

ABSTRACT (limit to 7400 spaces, i.e. approximately fifteen single-space typewritten lines; 110

On 7/9/91 at 1230 hours, with the unit in Hot Shutdown, a cooldown to Cold Shutdown was initiated when it was determined that the surveillance frequency for the American Society of Mechanical Engineers Section XI Non Destructive Examination (NDE) (1978-1988) requirements during the First Ten Year Inspection Interval was exceeded. Several longitudinal welds on welded fittings in the Low Head Safety Injection System, the Residual Heat Removal System, and the High head Safety Injection System were inadvertently excluded from the First Ten Year Interval NDE inservice inspection program. The longitudinal welds were not included on the isometric drawings that were used to formulate the NDE inservice inspection program. An inadequate review of the piping spool piece drawings and associated Component Certified Mill Test Reports supplied during the original construction from the piping fabricator resulted in the development of incomplete isometric drawings. All required welds have been inspected with no indications found. A review of piping spool piece drawings from original fabrication was performed to verify that all required longitudinal welds in fittings are included in the NDE inservice inspection program. There were no safety implications to the public as the Unit was shutdown in accordance with Technical Specifications and all of the inspected welds are acceptable.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Beaver Valley Power Station Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 3 4	LER NUMBER (6)			PAGE (3)		
		YEAR 9 1	SEQUENTIAL NUMBER 0 1 9	REVISION NUMBER 0 2			
					0 2	OF	0 7

TEXT (If more space is required, use additional NRC Form 356A's) (17)

DESCRIPTION OF EVENT

On 6/12/91, with the Unit in Cold Shutdown (Operating Mode 5) at the end of the Eighth Refueling Outage, a Quality Assurance auditor, based on a field observation, questioned if several longitudinal welds in the Low Head Safety Injection (LHSI) System piping were examined as required by site Non Destructive Examination (NDE) inservice inspection program. A review of the LHSI piping drawings and the inservice inspection program was implemented. On 6/18/91, it was determined that full compliance to the American Society of Mechanical Engineers (ASME) Section XI Non Destructive Examination (NDE) requirements during the First Ten Year Inspection Interval had not been met for these longitudinal welds. Per ASME Section XI (74S75), a sampling of the total number of longitudinal welds in fittings required volumetric examination during the First Ten Year Inspection Interval, which expired on 2/26/88. A review of original fabrication documentation revealed that seventy-six (76) longitudinal welds (of which 45 were in fittings) in a portion of the Class 2 piping in the LHSI System had been excluded from the NDE inservice inspection drawings, and therefore they were not inspected during the first ten year inspection interval. The affected portion of the LHSI system included the Class 2 section of the pump suction from the refueling water storage tank, pump suction from the containment sump, and the LHSI pump discharge to the High Head Safety Injection Pumps.

An operability assessment of the excluded fittings was performed and the subject lines were determined to be structurally sound and functionally operable. Based on the operability assessment, and the fact that compliance with the present Second Ten Year Interval had not been compromised, it was determined that transitions to higher operating modes were permissible and the longitudinal fitting welds would be scheduled for examination. The Unit entered Hot Shutdown (Operating Mode 4) on 6/27/91 at 1616 hours, and Hot Standby (Operating Mode 3) on 6/29/91 at 1830 hours. Following discovery of a leaking thermocouple conoseal on the reactor vessel head, the Unit was returned to Cold Shutdown on 7/04/91 at 0205 hours. After leaks were repaired the Unit entered Hot Shutdown at 1759 hours on 7/08/91.

On 7/09/91, as a result of further investigations, the LHSI piping was declared inoperable and Technical Specification (TS) 3.5.3 required a plant cooldown to Cold Shutdown within the next 20 hours. Since the required inspections were not expected to be completed within the next 20 hours, a cooldown to Cold Shutdown was completed at 1327 hours on 7/09/91. The Nuclear Regulatory Commission was notified of the plant shutdown at 1328 hours in accordance with 10CFR50.72.b.1.i.A "the initiation of any nuclear plant shutdown required by the plant's Technical Specifications".

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Beaver Valley Power Station Unit 1	0 5 0 0 0 3 3 4 9 1	—	0 1 9	—	0 2	0 3 OF 0 7	

TEXT (If more space is required, use additional NRC Form 366A's) (17)

The review of piping fabrication documentation continued. It included a review of the fabricator's spool piece drawings and Component Certified Mill Test Reports (CMTR) supplied during plant construction. This review identified additional longitudinal fitting welds in the Residual Heat Removal (RHR) System and the High Head Safety Injection (HHSI) System that were not inspected. The affected portion of the RHR system included the RHR pump discharge to the RHR return isolation valves. The affected portion of the HHSI system included the HHSI pump suction from the LHSI pumps. The required number of fitting welds in each system (eight LHSI, eight HHSI, and ten RHR) were examined per ASME Section XI. The inspections were completed on 7/12/91 at 1200 hours, with no defective welds present.

On 10/18/92, an in-depth study was completed concerning the longitudinal welds and the required inspections. This study concluded that the number of longitudinal welds omitted was actually 197 vice the original estimate of 201 longitudinal welds. The difference in the total number of welds is due to instances where the piping specification and certified test mill reports showed that the fittings could have been made with or without a seam. It was conservatively assumed that these fittings contained a weld, but further reviews indicated that the welds did not exist.

Code requirements applicable to the 197 welds were evaluated; nine (9) welds were exempt per the 74S75 Code and forty-two (42) welds were located in piping (not in fitting applications as previously assumed) and therefore outside the examination scope of the first interval. Of the remaining 146 longitudinal welds, 119 welds were made without filler material. An ASME XI Interpretation issued on September 10, 1991, states that longitudinal welds made without filler metal are outside the scope of ASME XI inspection requirements. Utilizing this interpretation and the exemptions allowed by ASME XI, only twenty-seven (27) of the 197 longitudinal welds would have been within the inspection requirements of ASME XI during the first interval. Applying ASME XI (74S75) Code examination selection criteria to these 27 welds would have required examination of a minimum of three (3) welds in the first interval and a total of 21 welds over the 40-year life of the plant. Eight (8) welds were examined in July 1991, to ensure compliance with the sampling requirements of the first interval.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)	PAGE (3)
		YEAR SEQUENTIAL NUMBER REVISION NUMBER	
Beaver Valley Power Station Unit 1	0 5 0 0 0 3 3 4	9 1 — 0 1 9 — 0 2	0 4 OF 0 7

TEXT (If more space is required, use additional NRC Form 306A's) (17)

CAUSE OF THE EVENT

A field investigation by a Quality Assurance auditor identified welds that were not specified in the NDE inservice inspection program. A subsequent investigation revealed that additional longitudinal welds in fittings had not been included on the piping drawings used to develop the First Ten Year NDE Inservice Inspection Program, and thus the required number of longitudinal welds in fittings were not inspected during the First Ten Year Inspection Interval. In 1984, the information contained in original plant construction drawings and documentation, which was utilized to formulate the First Ten Year Interval Inservice Inspection Program, was consolidated on a new series of ISI isometric drawings formatted for ISI purposes. Since the isometric drawings for plant construction did not identify longitudinal welds in fittings made by the piping component manufacturer or spool piece fabricator, they had not been included on the new ISI isometrics and thus had not been included in the First Ten Year Interval NDE inservice inspection program. An inadequate review of the spool piece drawings and associated CMTRs, supplied by the piping fabricator during plant construction, resulted in the development of isometric drawings that did not account for longitudinal welds made during component manufacture. While not diagrammatically depicted on the fabricator spool piece drawings, the spool piece drawings do generally contain detailed descriptions and specifications of the pipe spool components on the bill of materials. From the information contained in the spool piece drawing bill of material, combined with a review of the associated piping Component Certified Mill Test Report documentation, it was possible to identify those piping components containing longitudinal welds. It was evident from the CMTR information that original construction code NDE requirements (100% X-ray of all longitudinal welds) had been completed by the fabricator.

An operability determination was made when the First Ten Year Interval inservice inspection frequency for the longitudinal welds was initially discovered to have been exceeded. A similar operability assessment was performed in response to LER 91-009-00 on several systems that were not hydrostatically tested in accordance with ASME Section XI to prove operability.

Based on the assessments performed as a result of LER 91-009-00, and since compliance to the present Second Ten Year Interval was not compromised, it was determined that an operability assessment was all that was required to prove operability of the LHSI system, and the identified fitting welds could be inspected at a future date during power operation. Although the operability assessment deemed the fittings as operable, it was

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

YEAR SEQUENTIAL NUMBER REVISION NUMBER

Beaver Valley Power Station Unit 1

0 1 5 0 0 0 3 3 4 9 1 — 0 1 9 — 0 2 0 5 OF 0 7

TEXT (If more space is required, use additional NRC Form 366A's) (17)

later determined that such an assessment may not have been in strict compliance with Technical Specifications in regards to the First Ten Year Interval, and that operability should have been verified by examination prior to plant heatup. Compliance to the present Second Ten Year Interval ASME Section XI code of record (1983 edition, S 1983 addenda) and the Technical Specifications in regards to this Second Ten Year Interval was not compromised.

CORRECTIVE ACTIONS

The following corrective actions have been or will be taken as a result of this event:

- 1). Prior to re-entry into Hot Shutdown, the required number of longitudinal fitting welds were examined to comply with the sampling requirements of ASME Section XI (74S75). No structural defects were present in the welds.
- 2). A review of all Class 1 and 2 piping that requires NDE inservice inspection and have the possibility of containing longitudinal welds has been conducted. This included a detailed review of each spool piece drawing and when necessary, associated piping Component Certified Mill Test Reports, to determine if longitudinal welds were present and included in the NDE inservice inspection program.
- 3). A programmatic review of the NDE inservice inspection program has been completed to further ensure that all relevant fabrication and construction documentation has been adequately reviewed and included in the inservice inspection program. Piping walkdowns will be conducted to supplement this review if determined to be necessary.
- 4). A similar detailed review of fabrication and manufacturing documentation for Beaver Valley Unit 2 will be initiated. If any relevant deficiencies are identified, the Unit 2 First Ten Year Interval program will be appropriately revised.
- 5). A root cause analysis of this event is being performed which may identify additional corrective actions, as necessary.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (8)

PAGE (3)

Beaver Valley Power Station Unit 1

0 5 0 0 0 3 3 4 9 1 — 0 1 9 — 0 2 0 6 OF 0 7

TEXT (If more space is required, use additional NRC Form 365A's) (17)

PREVIOUS OCCURRENCES

There was one previous similar event involving Residual Heat Removal System welds excluded from the NDE inservice inspection program. These welds were identified through a Safety System Functional Evaluation (SSFE) and the inspections were performed during the Seventh Refueling Outage. Additionally, LER 91-009-00 reported an event in which a portion of the Chemical and Volume Control System piping was not hydrostatically tested in accordance with ASME Section XI.

SAFETY IMPLICATIONS

There were no safety implication to the public as a result of this event. An operability assessment of the excluded fittings was performed and the subject lines were determined to be structurally sound and functionally operable. The Unit was placed in Cold Shutdown in accordance with Technical Specifications, and the required number of longitudinal welds were examined with no indications present. When the plant was in Cold Shutdown the affected systems were not used as part of the designated emergency boration flowpath.

REPORTABILITY

Beaver Valley Unit 1 entered Hot Shutdown on 7/08/91 at 1758 hours prior to the inspections of the longitudinal fitting welds on the HHSI, LHSI and RHR systems. The HHSI and LHSI systems, which are required to be operable in Hot Shutdown, could not be considered operable prior to completion of the weld inspections, therefore entry into Hot Shutdown was in violation of Technical Specification 3.0.4, which permits operating mode escalation provided all the required equipment/systems are operable. Upon identification of the inoperable systems, the ACTION statement of Technical Specification 3.5.3 was entered. The required weld inspections could not be completed within the allotted time of the ACTION statement, therefore the Unit was placed in Cold Shutdown. Additionally, Technical Specification 3.4.10 requires the structural integrity of ASME Code Class 1, 2, and 3 components be maintained in accordance with Technical Specification 4.0.5. This written report is being submitted in accordance with 10CFR50.73.a.2.i.A, the completion of any nuclear plant shutdown required by Technical Specifications, and 10CFR50.73.a.2.i.B, as an event or condition prohibited by Technical Specifications. Technical Specification 4.0.5.a states "Inservice inspection of ASME Code Class 1, 2, and 3

4
LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Beaver Valley Power Station Unit 1	0 1 5 0 0 0 3 3 4	9 1	0 1 9	0 2	0 7	OF 0 7	

TEXT (If more space is required, use additional NRC Form 366A's) (17)

components and inservice testing of ASME Code Class 1, 2, and 3 pumps and valves shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10CFR50, Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10CFR50, Section 50.55a(g)(6)(i)". The required components were not examined in accordance with ASME Section XI for the First Ten Year Interval, and written relief from examination was not requested.