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L-00-125

***Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334 License No. DPR-66  
LER 2000-007-00***

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

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

LER 2000-007-00, 10 CFR 50.73(a)(2)(i), "Technical Specification Non-Compliance Due to Misinterpretation of Containment Isolation Valve Requirements for GDC 57 Penetrations."

As described within the attached LER and in NRC Inspection Report 05000334/2000-010, 05000412/2000-010, dated October 13, 2000; this event was initially evaluated by station personnel as meeting applicable technical specification requirements. This report is being submitted within 30 days of September 20, 2000, when station personnel concluded that their application of technical specification requirements for this event was incorrect. Thus, this report is submitted more than 30 days from the date of the event on August 28, 2000.



Lew W. Myers

Attachment

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cc: Mr. H. J. Miller, Regional Administrator  
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**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: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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.

**FACILITY NAME (1)**

Beaver Valley Power Station Unit 1

**DOCKET NUMBER (2)**

05000334

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**TITLE (4)**

Technical Specification Non-Compliance Due to Misinterpretation of Containment Isolation Valve Requirements for GDC 57 Penetrations

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	28	2000	2000	-- 007	-- 00	10	20	2000	None	
									FACILITY NAME	DOCKET NUMBER
									FACILITY NAME	DOCKET NUMBER

  

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
1	100 %	20.2201(b)	20.2203(a)(1)	20.2203(a)(2)(i)	20.2203(a)(2)(v)
		20.2203(a)(2)(ii)	20.2203(a)(2)(iii)	20.2203(a)(2)(iv)	20.2203(a)(2)(v)
		20.2203(a)(2)(iv)	50.36(c)(1)	50.36(c)(2)	50.73(a)(2)(vii)
					50.73(a)(2)(viii)
					50.73(a)(2)(ix)
					73.71
					OTHER

**LICENSEE CONTACT FOR THIS LER (12)**

**NAME**

T. S. Cosgrove, Manager Licensing

**TELEPHONE NUMBER (Include Area Code)**

(724) 682-5203

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

**SUPPLEMENTAL REPORT EXPECTED (14)**

YES (If yes, complete EXPECTED SUBMISSION DATE).

X

NO

**EXPECTED SUBMISSION DATE (15)**

MONTH DAY YEAR

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

On August 28, 2000, at the Beaver Valley Power Station (BVPS) Unit No. 1, routine maintenance work was performed on a containment isolation valve (CIV) in a River Water System line for approximately 30 hours. This containment isolation valve is on a penetration where the inside boundary is a closed system (pursuant to General Design Criteria 57). This work intermittently removed the control room's capability to remotely operate this valve. Therefore, the valve was declared inoperable and the CIV technical specification's action entered. Based on Operations and Licensing review of a docketed NRC correspondence for a similar situation at another facility, the Action statement was interpreted to require flow be terminated through the closed system boundary to make it completely passive.

It was subsequently determined that the NRC correspondence was misapplied and that, although the Updated Final Safety Analysis Report and Licensing Requirements Manual referred to the inside containment isolation valve as the closed system, the closed system could not be considered an automatic valve with regard to meeting the CIV Technical Specification's Action statement. Thus, this action constituted a condition prohibited by Technical Specifications since the Action statement was not fulfilled during the maintenance work and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B). The safety significance for this event was small.

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

**PLANT AND SYSTEM IDENTIFICATION**

Westinghouse-Pressurized Water Reactor System  
 Reactor Containment Building (NH)  
 Containment Isolation Control System (JM)  
 River Water System (BS)  
 Recirculation Spray System (BE)

**CONDITIONS PRIOR TO OCCURRENCE**

Unit 1: Mode 1 at 100 % power

There were no systems, structures, or components that were inoperable that contributed to the event.

**DESCRIPTION OF EVENT**

On August 28, 2000, at the Beaver Valley Power Station (BVPS) Unit No. 1, routine maintenance work was performed on the River Water System valve MOV-1RW-104A which removed the control room's capability to remotely operate this valve from the control room for approximately 8 hours during the approximately 30 hours to fully perform and restore from this work. During this activity, MOV-1RW-104A was declared inoperable since remote manual capability to operate this valve from the control room would not be continually available during the testing. This valve is on river water piping which cools a Recirculation Spray (RS) System heat exchanger inside containment. This valve is a motor-operated normally-open containment isolation valve (CIV) on containment penetration Number 79 which the BVPS Unit 1 Updated Final Safety Analysis Report (UFSAR) states complies with 10 CFR 50 General Design Criteria (GDC) 57 [See figure on last page of this LER]. The subject maintenance (MOVATS testing) involved cycling the valve.

Before the work was initiated, the activity was evaluated for compliance with Technical Specification 3.6.3.1, Containment Isolation Valves. Technical Specification 3.6.3.1 Action b was entered when MOV-1RW-104A was declared inoperable. Action b states "Isolate the affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position." MOV-1RW-104A is the outside CIV on containment penetration Number 79. The BVPS Unit 1 UFSAR and Licensing Requirements Manual (LRM) list the inside CIV as the sealed system on Recirculation Spray System heat exchanger RS-E-1A. Thus, the heat exchanger was determined to be an automatic valve (since the heat exchanger's pressure boundary automatically performs its safety function to maintain the penetration's boundary) as listed in the UFSAR and LRM. "Deactivated" was determined to mean terminating flow through the heat exchanger to ensure that the inside CIV (i.e., the heat exchanger in this application) was made

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completely passive. The determination that the heat exchanger boundary inside containment was an automatic valve and that "deactivated" (when used with a sealed system in place of a CIV inside containment) meant to isolate the flow path making it a passive component, was determined to be consistent with a NRC letter issued by the Plant Systems Branch, dated January 27, 1988. This NRC letter described information and conclusions on a similar issue at another facility involving Technical Specification Action compliance when a containment isolation valve becomes inoperable, the remaining barrier involves a closed system inside containment, and the Action statements assume that the remaining operable barrier is a valve.

When Technical Specification 3.6.3.1 Action b was implemented, it was determined that a valve in the flow path near penetration Number 79 had to be de-energized closed to terminate flow through penetration Number 79, making the inside sealed system passive. Thus, the closest upstream valve and the closest downstream valve to penetration Number 79 were considered. MOV-1RW-103A and MOV-1RW-103B were the first valves upstream of penetration Number 79 which would terminate flow through penetration Number 79. [MOV-1RW-103A/B are normally closed valves which receive an automatic open signal upon a containment isolation phase B (CIB).] However, the upstream valve was not chosen since it would remove flow from two RS heat exchangers rather than using the downstream valve which would remove flow from only one RS heat exchanger. MOV-1RW-105A was the first valve downstream of penetration Number 79 which would terminate flow. [MOV-1RW-105A is a normally open CIV.] MOV-1RW-105A also happens to be the outside CIV for containment penetration Number 83. Closing MOV-1RW-103A/B was considered equivalent to closing MOV-1RW-105A for meeting Technical Specification 3.6.3.1 Action b. MOV-1RW-105A was closed and de-energized since closing MOV-1RW-103A/B would have isolated two RS heat exchangers, reducing the number of available RS heat exchangers and increasing the risk to the operating unit.

Following the completion of the maintenance activity, the NRC resident inspectors questioned if this action complied with Technical Specification 3.6.3.1. A subsequent telephone conference which included NRC Regional and Headquarters staff concluded that the maintenance activity performed on August 28, 2000, did not comply with Technical Specification 3.6.3.1 and the NRC letter referenced by BVPS was not relevant. The NRC stated that terminating flow through a penetration involving a closed system was not sufficient to meet the Technical Specification Action requirement for deactivation when involving a closed system. The NRC stated that the penetration should have been isolated by closing at least one valve in all locations connected upstream of the subject containment penetration in order to comply with the Technical Specification Action statements (which for this application would have required River Water System valves 103A, 103B, 104, 104C, 204, 206, 393 and 811 to be closed and deenergized; see figure at the end of this LER). The NRC also stated that, regardless of the statements in the UFSAR and LRM to the contrary, a sealed system can not be considered a containment isolation valve with respect to implementing a Technical Specification Action statement.

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**REPORTABILITY**

BVPS has determined that the maintenance activity performed on August 28, 2000, on BVPS Unit 1 did not comply with Technical Specification 3.6.3.1. This was a condition prohibited by plant Technical Specifications and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

This situation was initially evaluated by station personnel as meeting applicable technical specification requirements. This report is being submitted within 30 days of when station personnel concluded that their application of technical specification requirements was incorrect. Thus, this report is submitted more than 30 days from the date of the subject maintenance activities on August 28, 2000.

**CAUSE OF EVENT**

The cause of the Technical Specification non-compliance was human error by not complying with the Technical Specifications as written. Station personnel misapplied previous NRC correspondence for another facility which appeared to be applicable to this situation, when the (only) CIV becomes inoperable on a GDC 57 designed containment penetration.

**SAFETY IMPLICATIONS**

Containment penetration Number 79 is normally open during all design basis accident (DBA) conditions. During a postulated Design Basis LOCA, the containment barrier is the sealed system pressure boundary inside containment since MOV-1RW-104A would be open. This penetration would be (manually) isolated only if a passive failure were to occur on the piping connected to containment penetration Number 79 or in the sealed system barrier inside containment. The pressure boundary of the sealed system downstream of containment penetration Number 79 was not challenged by the maintenance testing performed on August 28, 2000. Since there was no leakage on the Recirculation Spray System heat exchanger pressure boundary, the internal barrier afforded pursuant to the GDC 57 design arrangement on containment penetration Number 79 remained available throughout the subject maintenance activities.

The pressure boundary of MOV-1RW-104A was not opened or challenged throughout the subject maintenance testing. The MOV-1RW-104A valve was able to be power operated during much of the time that it was listed as inoperable. Manual operation at the MOV-1RW-104A valve location was always available even when power operation of the valve operator was briefly removed for attachment/removal of test equipment. Thus, the normal CIV for containment penetration Number 79 could have been used to isolate this penetration if there was an immediate need to isolate this penetration.

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Seven of the eight valves which should have been closed and de-energized pursuant to Technical Specification 3.6.3.1 Action statements whenever MOV-1RW-104A is inoperable are normally closed and remained closed during the subject maintenance testing. Only MOV-1RW-104C remained open. MOV-1RW-104C is a normally open CIV. Thus, a level of isolation was provided to containment penetration Number 79 through the seven closed valves except through MOV-1RW-104C (with some not de-energized).

1RW-193 is a spring-loaded check valve immediately upstream of containment penetration Number 79. The design of this penetration takes no credit for this valve towards meeting the GDC 57 criteria. However, since this check valve is not a simple check and with flow terminated through penetration Number 79 (via closure of MOV-1RW-105A), check valve 1RW-193 was a deactivated automatic valve located outside containment in its secured position that isolates penetration Number 79. Thus, although this additional level of penetration isolation was not credited as meeting Technical Specification 3.6.3.1 Action Statement b, check valve 1RW-193 did provide another actual complete level of isolation for containment penetration Number 79 in addition to that afforded by the sealed system.

The increase in core damage frequency (CDF) above the normal annualized PRA value is small, based on the unavailability of Recirculation Spray Heat Exchanger 1RS-E-1A due to containment isolation valve MOV-1RW-104A being closed. This small increase in CDF would be considered "GREEN" per the NRC Significance Determination Process.

Based on the above, the safety significance of the Technical Specification 3.6.3.1 noncompliance during the subject maintenance activities on August 28, 2000, was small.

**CORRECTIVE ACTIONS**

1. The personnel directly involved with the evaluation of the Technical Specification 3.6.3.1 criteria associated with this maintenance activity were counseled on the correct application of the Technical Specification requirements.
2. A lessons learned report on this event has been developed which will be used in training for the operating crews.

Corrective action completion is being tracked through the corrective action program.

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**PREVIOUS SIMILAR EVENTS**

A review of the Licensee Event Reports found two similar events at BVPS Unit 1 and three events at BVPS Unit 2 involving operational issues associated with containment isolation valves within the last four years:

- LER 1-97-026, "Control Room Ventilation Isolation Dampers and Containment Isolation Valves Do Not Meet Technical Specification Engineered Safety Feature Response Time Surveillance Requirements."
- LER 1-96-011, "Failure to Provide Administrative Control of Containment Isolation Valves as Required by Technical Specifications."
- LER 2-98-001, "Failure to Perform Surveillance Testing of Containment Isolation Spring Loaded Check Valve as Required by Technical Specification 4.6.3.1.2.e."
- LER 2-97-004, "Four Containment Isolation Valves Not Tested in Accordance with Technical Specifications."
- LER 2-96-002, "Condition Prohibited by Technical Specifications - Containment Penetration Not Isolated Within the Time Limit"

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Simplified Containment Penetration Number 79 Arrangement  
(Normal System Arrangement Shown)

