Duquesne Light Company

Beaver Valley Power Station P.O. Box 4 Shippingport, PA 15077-0004

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July 1, 1998 L-98-137

Beaver Valley Power Station, Unit No. 1 Docket No. 50-334 License No. DPR-66 LER 98-024-00

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 98-024-00, 10 CFR 50.73(a)(2)(ii) and 10 CFR 50.73(a)(2)(v), "Internal Flooding Discrepancy in the Intake Structure Pump Cubicles."

R. D. Brandt

Attachment





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cc: Mr. H. J. Miller, Regional Administrator
United States Nuclear Regulatory Commission
Region 1
475 Allendale Road
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Mr. D. S. Brinkman BVPS Senior Project Manager United States Nuclear Regulatory Commission Washington, DC 20555

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NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION								APPROVED BY OMB NO. 3150-0104							
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NAME R. D. Hart, Senior Licensing Supervisor									TELEPHONE NUMBER (include Area Code) (412) 393-5284						
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During the preparation for a Quality Services Unit audit, a UFSAR discrepancy was identified. The Unit 1 UFSAR (Section 9.7) states: "River Water Pumps and Engine-Driven Fire Pump - Intake Structure - There are no equipment or floor drains located in the intake structure. There are no precautions necessary to prevent flooding in the event of a major pipe rupture in any of the pressure water lines in the pump cubicles because open cubicle access doors will permit the excess water to flow out of the cubicles." These statements in the UFSAR imply that the entrance door on each of the four river water pump cubicles in the Intake Structure are maintained open. These four fire/security doors have been normally maintained close. An engineering review of the internal flooding calculations was performed in efforts to determine whether the UFSAR could be revised to reflect the Intake Structure pump cubicle door configuration to be closed. The review determined a new failure mode of equipment in the pump cubicle entrance door closed, internal flooding could be postulated which could cause a second cubicle interconnecting door leading to an adjacent pump cubicle to open. This resultant impact could potentially lead to the loss of the redundant trains of River Water System at Unit 1 or to the loss of the redundant trains of Service Water System at Unit 2. This condition is being reported in accordance with the provisions of 10 CFR 50.73(a)(2)(v) and 10 CFR 50.73(a)(2)(ii)(A) since the loss of both river/service water systems would remove the normal safety related methods of cooling equipment necessary to remove decay heat and thus the units were in an unanalyzed condition that significantly compromises plant safety.

Flood doors over each of the two interconnecting pump cubicle doors in the Intake Structure were closed on June 4, 1998 and will remain normally closed. This will prevent any postulated internal flood in one Intake Structure pump cubicle from adversely affecting the safety related components in the adjacent pump cubicle. There had been a potential for a postulated internal flooding to prevent the fulfillment of the safety function of the normal systems used to remove decay heat. An Alternate Intake Structure exists that contains the Alternate River Water System pumps for Unit 1 and the Standby Service Water System pumps for Unit 2 which provide a backup cooling water flow capability to the equipment necessary to remove decay heat. Thus, there was minimal safety consequence to this event since there was a backup capability to maintain cooling water flow to equipment needed to remove decay heat. The health and safety of the public were not affected.

NRC FORM 366 (4-95)

NRC FORM 366A (4-95)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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FACILITY NAME (1)	DOCKET NUMBER (2) LER NUMBER (6)					
Beaver Valley Power Station Unit 1	05000334	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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PLANT AND SYSTEM IDENTIFICATION *

Westinghouse Pressurized Water Reactor {PWR} Intake Structure {MD, MK} Alternate Intake Structure {MD} BVPS Unit 1 River Water System {BI, BS} BVPS Unit 2 Service Water System {BS} BVPS Unit 1 Alternate River Water System {BS} BVPS Unit 2 Standby Service Water System {BS}

*Energy Industry Identification System (EIIS), system and component function identifier codes appear in the text as (SS/CCC).

CONDITIONS PRIOR TO OCCURRENCE

Beaver Valley Power Station Unit 1, Mode 5, 0 percent Reactor Power

There were no components, or systems that were not functional that contributed to the condition.

DESCRIPTION OF EVENT

During the preparation for a Quality Services Unit audit, a UFSAR discrepancy was identified. The Unit 1 UFSAR (Section 9.7) states: "<u>River Water Pumps and Engine-Driven Fire Pump - Intake Structure</u> - There are no equipment or floor drains located in the intake structure. There are no precautions necessary to prevent flooding in the event of a major pipe rupture in any of the pressure water lines in the pump cubicles because open cubicle access doors will permit the excess water to flow out of the cubicles." These statements in the UFSAR imply that the entrance door on each of the four river water pump cubicles in the Intake Structure are maintained open. These four fire/security doors have been normally maintained close since shortly after initial Unit 1 startup.

The BVPS Intake Structure pump cubicle arrangement is shown on Page 5. Each cubicle has one main entrance door and one door which connects to the adjacent cubicle. Pump Cubicle 'A' and 'B' have one interconnecting door way and Pump Cubicle 'C' and 'D' have one interconnecting door way. There is no door way between Pump Cubicle 'B' and 'C'.

NRC FORM 366A (4-95)

NRC FORM 366A (4-95)

U.S. NUCLEAR REGULATORY COMMISSION

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

DESCRIPTION OF EVENT (Continued)

On June 4, 1998, in support of a potential Unit 1 UFSAR change to revise the pump cubicle front entrance door position description from open to closed, Nuclear Engineering was reviewing the Unit 2 internal flooding analyses. It was identified that the calculated maximum potential flood height in a pump cubicle from an internal flood could cause the normally closed interconnecting door between Cubicle A & B (or between Cubicle C & D) to fail open, since this normal service door was not designed to withstand the calculated height of water from an internal flood. The front entrance door was not expected to fail open since it closes against the door frame. Failure of this interconnecting cubicle door during the postulated internal flood could potentially lead to failure of both Unit 1 River Water System trains or both Unit 2 Service Water System trains. This is a new failure mode of equipment in the pump cubicles that had not previously been considered. Failure of both Unit 1 River Water System trains or the normal safety related methods of cooling equipment necessary to remove decay heat.

Since this event alone could have prevented the fulfillment of the safety function of systems needed to remove decay heat and it was a condition outside of the plant design basis, it is reportable pursuant to 10 CFR 50.73(a)(2)(v) and 10 CFR 50.73(a)(2)(ii)(B). Similarly, this condition was reported to the NRC on June 4, 1998 pursuant to 10 CFR 50.72(b)(2)(iii)(B).

CAUSE OF EVENT

The apparent cause of this event was inadequate consideration of all of the effects from postulated internal flooding within the pump cubicles in the Intake Structure. Flood protection is available on these interconnecting pump cubicle doors to address external flooding causing their potential failure. However this flood protection is not normally implemented except during a potential external flooding condition. The evaluation for internal flooding inadvertently did not consider any similar internal flood consequences on the interconnecting pump cubicle doors.

CORRECTIVE ACTIONS

COMPLETED

 Flood doors over each of the two interconnecting pump cubicle doors in the Intake Structure were closed on June 4, 1998 and have remained closed. This will prevent any postulated internal flood in one Intake Structure pump cubicle from adversely affecting the safety related components in the adjacent pump cubicle. A placard has been posted on the outside of the two interconnecting flood door waraing personnel that the flood door must remain shut and to contact both Unit Control Rooms prior to opening.

FUTURE

2. The Unit 1 UFSAR will be revised to address the configuration of the Intake Structure main entrance and interconnecting cubicle doors. Since this may address a new failure mode of safety related equipment that had not previously been considered, this change will be processed in accordance with 10CFR 50.59 and other station procedures regarding potential unreviewed safety questions. An unreviewed safety question submittal to the NRC will be issued before either Unit enters Mode 4 from their current extended outage.

NRC FORM 366A (4-95)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

DOCKET NUMBER (2)		PAGE (3)		
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

CORRECTIVE ACTIONS (Continued)

3. An evaluation will be conducted on other BVPS internal flooding calculations to review the adequacy of analyses assumptions and configurations. This will be complete by September 30, 1998.

REPORTABILITY

The potential for a postulated internal flood within one Intake Structure pump cubicle could have disabled both trains of River Water Systems at Unit 1 and both trains of Service Water Systems at Unit 2, preventing the fulfillment of the safety function of systems needed to remove decay heat and was an unanalyzed condition that significantly compromised plant safety. Therefore this condition is reportable pursuant to 10 CFR 50.73(a)(2)(v) and 10 CFR 50.73(a)(2)(ii)(A). Similarly, this condition was reported to the NRC on June 4, 1998 pursuant to 10 CFR 50.72(b)(2)(iii)(B).

SAFETY IMPLICATIONS

There had been a potential for a postulated internal flooding to prevent the fulfillment of the safety function of the normal systems used to remove decay heat due to the inadequacy of the pump cubicle door design in the Intake Structure. There were no components or systems that were not functional that contributed to the condition. Also, there were no manual or automatic safety system actuations required as a result of this condition.

An Alternate Intake Structure exists that contains the Alternate River Water System pumps for Unit 1 and the Standby Service Water System pumps for Unit 2. The Alternate River Water System (for Unit 1) and the Standby Service Water System (for Unit 2) would be unaffected by an internal flood in the Intake Structure. Though not designed to provide backup River Water/Service Water cooling flow during a postulated internal flood in the Intake Structure, these systems would have been capable of providing a backup cooling water flow to equipment needed to remove decay heat. Thus, there was minimal safety consequence to this event since there was a backup capability to maintain cooling water flow to equipment needed to remove decay heat. The health and safety of the public were not affected.

SIMILAR EVENTS

A review of BVPS Licensee Event Reports for Beaver Valley Power Station Unit 1 and Unit 2 identified one similar occurrence involving internal flooding issues:

LER 1-95-010, "Station Shutdown for Replacement of Rubber Expansion Joints in the River Water System."

NRC FORM 366A (4-95)

