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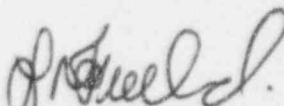
June 8, 1995
ND3MNO:3680

**Beaver Valley Power Station, Unit No. 2
BV-2 Docket No. 50-412, License No. NPF-73
Potential 10 CFR 21 Condition, Suction Valves for the
Recirculation Spray Pumps
Special Report - Supplement No. 1**

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Duquesne Light Company hereby submits the attached supplemental information relative to the Special Report submitted previously on December 10, 1993 (reference letter number ND3MNO:3519). The issue involved a potential 10 CFR Part 21 condition at Beaver Valley Power Station (BVPS) Unit No. 2 regarding unacceptable recirculation spray system operation for supporting long term core cooling capability and maintaining containment pressure subatmospheric in the event of a loss-of-coolant-accident (LOCA). This issue was identified and reviewed during the fourth refueling outage. Sections vii and viii of Attachment 1 have been revised to include the supplemental information based on recent experience obtained at BVPS Unit No. 2 during the fifth refueling outage.

Should you have any further questions regarding this matter, please contact F. D. Schuster at (412) 393-4736.


L. R. Freeland
General Manager
Nuclear Operations

JJM/lmc

Attachments

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10 CFR Part 21, Supplement No. 1
BVPS Unit No. 2 - Suction Valves for the Recirculation Spray Pumps

(i) Name and Address of Individual Making Notification:

L. R. Freeland, General Manager, Nuclear Operations
Duquesne Light Company
Beaver Valley Power Station
P.O. Box 4
Shippingport, PA 15077

(ii) Basic Component Affected:

Motor-operated suction valves [2RSS-MOV155A, B, C and D] for the Recirculation Spray Pumps which are utilized for long term core cooling capability and maintaining the containment pressure subatmospheric in the event of a Loss of Coolant Accident (LOCA). The valve is a 12" Henry Pratt Butterfly Valve (Model 1400).

(iii) Firms Supplying Components:

Supplier: Henry Pratt Company
401 South Highland Ave.
Aurora, Illinois 60506-3392

(iv) Nature of Defect:

During shutdown mode testing of Recirculation Spray Pump [2RSS-P21D], the pump developed inadequate discharge pressure. Subsequent investigation discovered that the disc of the motor-operated valve (MOV) on the suction of the pump was not engaged to the motor operator. The shaft spline adapter of the motor-operator had moved out of position becoming separated from the adapter drive sleeve.

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(Continued)

The spline adapter is retained in the motor operator by an adapter plate which is in turn supported by a valve bonnet piece. The retention is accomplished by limiting the through-hole diameters of the adapter plate and bonnet piece to a value that would not allow the spline adapter to move out of position. Both diameters were intended to be the same for the above valve. If the adapter plate diameter is larger than the diameter of the bonnet piece, the spline adapter could be retained by the bonnet piece.

However, this arrangement may not provide sufficient spline engagement depending on specific valve dimensions (see attached sketch). For the Beaver Valley Power Station Unit Number 2, the adapter plate and bonnet piece-plate were provided by the valve manufacturer. The valve is a 12" Pratt Butterfly valve (Model 1400) with a Limitorque HBC Operator.

This design deficiency was also noted on the other three Recirculation Spray Pump Suction Valves for pumps 21A, 21B and 21C, and although these valves continued operating properly, a common mode failure of the suction valves for all four recirculation spray pumps potentially existed if gone undetected. The deficiency was found during shutdown mode conditions. The investigation leading to the failure determined the suction valve [2RSS-MOV155D] failed either following the recent outage static MOV testing or during pump flow testing. This investigation confirmed the operability of the suction valves during power operation.

Duquesne Light Company (DLC) reviewed the original purchase order file, applicable vendor documents, and the maintenance history, associated with the Henry Pratt valves (2RSS-MOV155A, B, C & D). DLC determined that there was no work activity or initiating problem that could have led to modification or replacement of the adapter plate and/or bonnet at BVPS during construction or subsequent power operations and that the adapter plates are in their "as received" condition.

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(Continued)

Safety Implications:

If the failure had gone undetected, the possibility existed for a common mode failure of all four suction valves to the Recirculation Spray Pumps which would have prevented long term core cooling capability and containment cooling in the event of a LOCA. The suction valves are normally in the "open" position and will receive a signal to open on a Containment Isolation Phase "B" (CIB) to ensure the suction valve of the pump is open. However, the valves are stroke tested on a quarterly basis. The potential for the valve disc of the MOV to become disengaged from the motor operator due to this common mode defect could have resulted in the valves becoming disengaged in the "closed" position. The Operations staff would not have had knowledge of this condition because the limit switches would have indicated "open" in the Control Room.

Also postulated was the failure of the Recirculation Spray Pump 21D as a result of the defect of the suction valve 2RSS-MOV155D (purple train powered) in conjunction with a single failure of the opposite train pump 21C (orange train powered). When the low-low level setpoint of the Refueling Water Storage Tank is reached after Safety Injection initiation, the C and D Recirculation Spray Pumps [2RSS-P21C, D] begin to support long-term core cooling by providing water from the Containment sump to the suction of the High-Head Safety Injection Pumps. Since the Recirculation Spray Pumps 21C and 21D are the only two pumps capable of recycling water back to the Reactor Coolant System, the injection phase via the Recirculation Spray System, in conjunction with single failure, could have been lost as a result of this defect.

Therefore, the defect, if gone undetected, could have created a major degradation of essential safety related equipment, and a required safety system may not have performed its function. As such, the defect is reportable pursuant to 10 CFR Part 21 requirements.

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(Continued)

(v) Date On Which Defect Identified:

The failure of the Recirculation Spray Pump Suction Valve [2RSS-MOV-155D] was identified on October 17, 1993, during the regularly scheduled pump performance test required by Tech Spec 4.6.2.2. The evaluation and resulting report was presented to the Onsite Safety Committee on December 2, 1993.

(vi) Number and Location of Components:

Affected Components: BVPS Unit No. 2 Recirculation Spray
Pump Suction Valves
[2RSS-MOV155A, B, C and D]

Location: BVPS Unit No. 2
Safeguards Building

(vii) Initial Corrective Actions Taken:

An inspection was conducted of the adapter plates and bonnets of all similar valves supplied by Henry Pratt. At that time, it was determined that the only valves affected by this defect were the four recirculation spray pump suction valves [2 RSS-MOV155A, B, C and D].

During the fourth refueling outage (2R4), a temporary modification was made to the four suction valves to properly position and retain the spline adapter. A temporary stem friction clamp device was secured to the valve shaft for all four valves to prevent axial movement of the spline adapter. The device was tested and visually observed to confirm proper operation. Replacement adapter plates were procured for the subject valves. Installation of the replacement hardware was scheduled for the fifth refueling outage (2R5).

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(Continued)

Follow-up Corrective Actions Taken:

A purchase order was generated to the vendor (Henry Pratt Co.) for four new adapter plates for the 12" Butterfly valves (Model 1400) with Limitorque HBC Operators, and the parts were received in July, 1994. During the recent 2R5 outage at BVPS Unit 2, the HBC Operator was removed from one of the subject valves in preparation for the adapter plate replacement. During the replacement process, it was noted that the adapter plate bore was still of sufficient size to allow the spline adapter to pass through. Since the new adapter plates would not properly support the spline adapter, the temporary stem friction clamp devices which demonstrated proper operation over the last 18 month operating cycle were reviewed and determined to be an acceptable design equivalent change for long-term application.

Based on our findings, an inspection was conducted of other valves that could be susceptible to potential disengagement. Field inspections determined that two additional valves showed some migration of the spline adaptor but no indication of disengagement. The valves were identified as follows:

- 2SWS-MOV120A and B "Rod Control Area and Control Room Air Conditioning Service Water Header A and B Valves"

Type: 14" Henry Pratt Butterfly Valves (Model 1100)

As a precaution, these valves were also modified with the stem friction clamp device to secure the HBC spline adaptor.

In conclusion, stem friction clamps have been permanently installed to retain the HBC spline adapter from slipping down the stem and thus prevent the possibility of the motor operator becoming disengaged from the drive sleeve for the four recirculation spray pump suction valves [2RSS-MOV155A, B, C and D] and the two service water valves [2SWS-MOV120A, B].

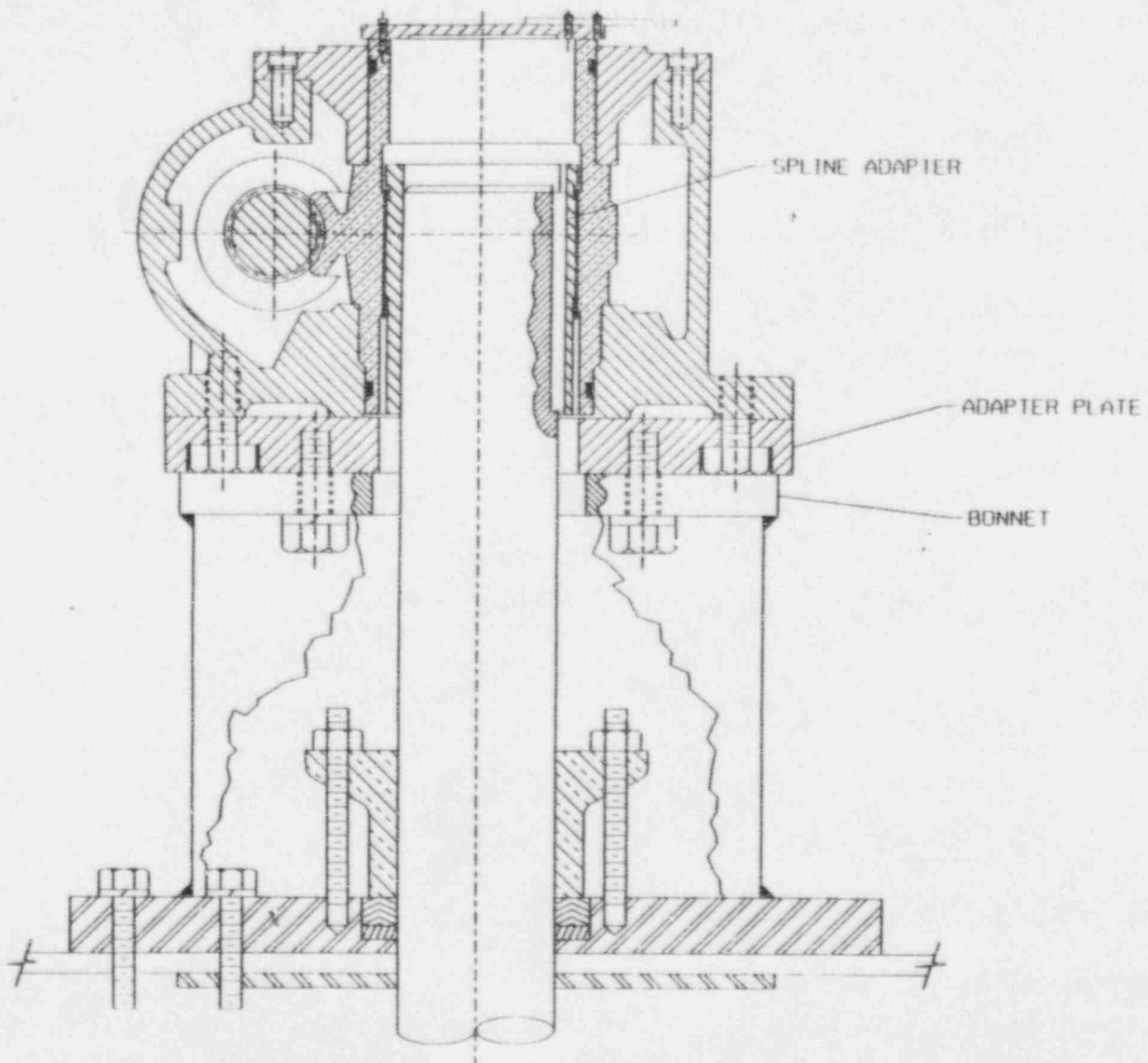
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(Continued)

(viii) Other Advice Related To Purchasers or Licensees:

No explanation could be provided by the vendor as to the potential design deficiency. The part numbers specified for this application were checked and confirmed by the vendor. It would appear that the adapter plates may not be compatible in some cases with the drive mechanisms of the Limitorque HBC Operators.



 Duquesne Light Company NUCLEAR GROUP		BEAVER VALLEY POWER STATION	
2RSS-MOV155A THRU D PART 21 SKETCH			
DATE: 11-23-93	CHKD:	SKETCH NO.	REV
DWN: KMK	APP:	2CMK00078	1