



Duquesne Light

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June 29, 1984

United States Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

ATTENTION: Dr. Thomas E. Murley
Administrator

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
Misapplication of Solenoid Operated Valves in Certain Safety
Related Applications
Significant Deficiency Report No. 84-05, Final Report

Gentlemen:

This report is in reference to the reportable Significant Deficiency relating to the "Misapplication of Solenoid Operated Valves in Certain Safety Related Applications." The previous report on this matter was submitted under the title, "Misapplication of Solenoid Operated Valves in Certain Containment Isolation Applications." The title on this Final Report has been changed to indicate that, after full evaluation, some of the areas of concern included safety related applications other than containment isolation. Duquesne Light Company does not expect to submit further reports on this matter.

DUQUESNE LIGHT COMPANY

SUBSCRIBED AND SWORN TO BEFORE ME THIS
29th DAY OF June, 1984.

Elva G. Lesondak

Notary Public

ELVA G. LESONDAK, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986
Attachment

By *E. J. Woolever*
E. J. Woolever
Vice President

cc: Mr. R. DeYoung, Director (3) (w/a)
Ms. M. Ley, Project Manager (w/a)
Mr. E. A. Licitra, Project Manager (w/a)
Mr. G. Walton, NRC Resident Inspector (w/a)
INPO Records Center (w/a)
NRC Document Control Desk (w/a)


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COMMONWEALTH OF PENNSYLVANIA)

) SS:

COUNTY OF ALLEGHENY)

On this 29th day of June, 1984, before me, a Notary Public in and for said Commonwealth and County, personally appeared R. J. Washabaugh who being duly sworn deposed and said that (1) he is duly authorized to execute and file the foregoing Submittal on behalf of E. J. Woolever, Vice President of Duquesne Light, (2) he is duly authorized to execute and file the foregoing Submittal on behalf of said Company, and (3) the statements set forth in the Submittal are true and correct to the best of his knowledge.


Notary Public

ELVA G. LESONDAK, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

BEAVER VALLEY POWER STATION - UNIT NO. 2
DUQUESNE LIGHT COMPANY

Report on Significant Deficiency No. 84-05
Misapplication of Solenoid Operated Valves
in Certain Safety Related Applications

1. SUMMARY

Certain in-line Target Rock solenoid operated valves may open when downstream pressure increases above upstream pressure allowing flow in the direction opposite of normal.

2. IMMEDIATE ACTION TAKEN

Stopwork E&DCR 2PH-0090 was written to stop work on all affected solenoid valves. On March 14, 1984, Mr. S. D. Hall, Acting Manager of Duquesne Light Company's Regulatory Affairs Department, notified Mr. R. Keimig of the NRC Region I Office of this reportable deficiency.

3. DESCRIPTION OF THE DEFICIENCY

The in-line Target Rock solenoid valves utilized on Beaver Valley Power Station, Unit 2 (BVPS-2), were identified to be sensitive to changes in pressure differential, such that an increase in downstream pressure above upstream pressure may allow flow in the opposite direction. A total of 49 valves of this type were specified on purchase order 2BV-719 for Category I systems.

4. ANALYSIS OF SAFETY IMPLICATIONS

Buildup of downstream pressure above upstream pressure may cause containment isolation SOV's to open during a Design Basis Accident breaking containment isolation. In other safety related applications, the reversed differential pressure may prevent performance of the required safety function.

5. CORRECTIVE ACTION TO REMEDY DEFICIENCY

The use of these solenoid operation valves has been evaluated for the 49 Category I applications covered by purchase order 2BVS-719. Although not included in the scope of this significant deficiency, the Category II applications for which these valves were specified have also been evaluated and appropriate corrective action taken.

The following acceptance criteria and coincident assumptions were used in the evaluation:

A. Acceptance Criteria

1. Containment Isolation - Leak tightness must be ensured in both flow directions; inside-to-outside containment and outside-to-inside containment, for the long term after an accident. The

FSAR commitment is to return to subatmospheric within one hour and to remain subatmospheric in the long term.

2. System Safety Function - Evaluation of valve opening upon backpressure must consider single-failure criteria, loss of offsite power, seismic event, etc., in addition to valve opening. Valve opening due to backpressure is not considered single-failure. System safety function must be achieved after all these effects are considered.
 3. Safety System Operation - Opening of a valve upon backpressure without a deliberate action by the operator may cause the system to be operated improperly or may cause confusion to the operator over whether a valve will stay closed during system realignments.
- B. Coincident Assumptions (Used to establish whether a backpressure exists on a valve or whether opening of a valve is acceptable.)
1. Single active or passive failure in safety systems.
 2. No nonsafety components are taken credit for to prevent backpressure.
 3. Pressure boundary of nonsafety piping not taken credit for, thus exposing valves to inside containment accident pressures and outside containment atmospheric pressure.
 4. All system operating modes considered in establishing backpressure conditions.

Based on the evaluation of the 49 Category I applications, DLC has determined that nine of these SOV's are acceptable as originally specified. The following corrective action will be taken to rectify safety concerns in the remaining 40 Category I applications:

- A. Twenty-two (22) SOV's will be replaced with pressure-balanced valves.
- B. Twelve (12) ASME III check valves will be added to eliminate back-pressure from seventeen (17) SOV's.
- C. One (1) SOV will be replaced with a motor-operated valve.

6. ADDITIONAL REPORTS

No further reports on this Significant Deficiency are anticipated by Duquesne Light Company.