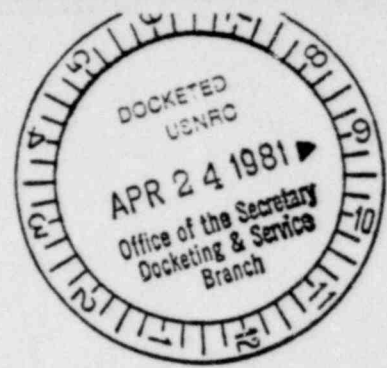


RELATED CORRESPONDENCE



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
METROPOLITAN EDISON COMPANY)
(Three Mile Island Nuclear)
Station, Unit 1))

Docket No. 50-289
(Restart)

AFFIDAVIT OF ROBERT D. POLLARD

Robert D. Pollard, being duly sworn, does depose and
state as follows:

1. I have reviewed the following documents:

a. UCS' Motion for Board Order on PORV Block Valve
Test Results, dated March 3, 1981, and the EPRI letter dated
January 14, 1981 attached to UCS' Motion;

b. Licensee's Answer, dated March 13, 1981, to UCS'
motion and the attached affidavits of Messers. Correa and
Urquhart;

c. The NRC Staff's Answer, dated March 23, 1981,
to UCS' Motion and the attached affidavit of Mr. Hemminger;

d. Licensee's Amended Answer, dated April 9, 1981,
to UCS' Motion and the attached supplemental affidavit of

810430 0463

Mr. Correa; and

e. Slides presented during an NRC Staff meeting held on March 20, 1981, concerning the EPRI testing program of PWR safety, relief, and block valves.

2. Block valves tested by EPRI and the failures observed are as follows:

a. July 1980 - Westinghouse block valve model 3GM88 equipped with a ROTORK operator set at 110 ft-lbs and tested in-line with a Control Components PORV would not close against full steam flow;

b. August 1980 - Anchor Darling block valve equipped with an unspecified operator and tested in-line with a Fisher PORV would not fully close against full steam flow and significant wear patterns were observed at the disc/seal interface;

c. Prior to October 27, 1980 - Rockwell block valve had a body to bonnet seal problem;

d. January 12, 1981 - Westinghouse block valve model 3GM99 equipped with a Limitorque operator model SMB-000-10 would not close fully against full steam flow (The model of in-line PORV, if any, has not been specified);

e. January 13, 1981 - Velan block valve model C2345 S/N-24302 equipped with a Limitorque actuator model

SMB-00-15 experienced galling on one of the disc guides (the model of in-line PORV, if any, has not been specified).

3. All failures of block valves to close fully during the EPRI tests involved a mismatch between the valve closing force needed and the size of the motor operator or an incorrect torque switch setting. No valve failures, per se, were involved in these failures to close.

4. The TMI-1 block valve (a Velan valve of unspecified model number) uses a Limitorque operator identical or similar to the Limitorque operator used on one of the Westinghouse block valves which would not close fully against full steam flow.

5. The block valve/motor operator combination used at TMI-1 has not been tested.

6. No information concerning the design differences and design similarities between the TMI-1 block valve and any of the block valves tested by EPRI has been supplied to this Board by the Staff or Licensee.

7. Limitorque uses the same methodology to match the size of the motor operator to the service requirements of the block valve in each case (Correa Supplemental Affidavit, paragraph 4.)

8. The EPRI tests involved cycling block valves open

and closed under full steam flow conditions.

9. Other tests involving water flow, mechanical fixture testing (using a hydraulic cylinder to duplicate flow loads so force transfer can be studied in depth) and seat friction factor tests (to determine stellite on stellite friction factors under water and steam conditions) are underway or complete for Westinghouse valves. The results have not yet been reported.

10. There is not sufficient information available upon which to base a conclusion that the TMI-1 block valve/motor operator combination "can be operated, closed, and opened for all fluid conditions expected under operating and accident conditions." (NUREG-0737, page 3-73)

11. If the TMI-1 PORV sticks open and the TMI-1 block valve cannot be closed, the result is a necessary challenge to the ECCS. Such challenges together with other challenges may exceed the design basis of the TMI-1 ECCS.

12. Staff counsel argues that "[t]he block valve test results reported in the EPRI letter are not relevant to TMI-1." (Staff answer at 3) This argument misrepresents the affidavit of Mr. Hemminger who states only that the tests of Westinghouse block valves are, to an unspecified degree, less relevant than tests on Velan valves. (Hemminger affidavit, paragraph 6)

13. Licensee argues that "the EPRI tests to date are valid confirmations of the TMI-1 block valve's capability. (Licensee Amended Answer at 2 and Correa supplemental affidavit, paragraph 6) However, this argument is not supported by Hemminger who states only that "[t]est data from Velan block valves could be applicable to TMI-1." (Hemminger affidavit, paragraph 7, emphasis added) Furthermore, EPRI is still developing a block valve test program responsive to the requirements of NUREG-0737 for submittal to the PWR utilities by June 1, 1981. Thus, the testing to date must be inadequate to demonstrate the capability of the block valves to function under the full range of fluid conditions expected under operating and accident conditions. Moreover, it should be noted that while the staff and Met Ed are willing to extrapolate from successful tests of valves similar to that at TMI-1 (but with at least a different motor operator), they are unwilling to accept the applicability of unsuccessful tests of a similar or identical motor operator but different valves. This is inconsistent and unjustifiable.

14. The following information should be provided to the Board:

a. The basis for the Staff's belief that block valve testing would provide verification of block valve

functionability. (See NUREG 0737, page 3-73) The explanation should discuss the failure of block valves to close in EPRI tests conducted in July and August 1980, months before the publication of NUREG 0737 in November 1980.

b. A comparison of the design of the valve/operator combinations tested by EPRI with the design of the actual valve/operator combination used at TMI-1.

c. A comparison of the methodologies used to determine the motor size, operator gear ratio, and closing loads for the TMI-1 block valve/operator combinations and the block valve/operator combinations which were unable to close fully in the EPRI tests.

d. A comparison of the range of fluid conditions which the TMI-1 block valve can be expected to experience under operating and accident conditions with the range of conditions experienced in tests or operation of other block valves whose capabilities are being relied upon to demonstrate TMI-1 block valve capability.

e. The effect, if any, on block valve functionability during tests conducted with a PORV in-line with the block valve, but different from the TMI-1 PORV.

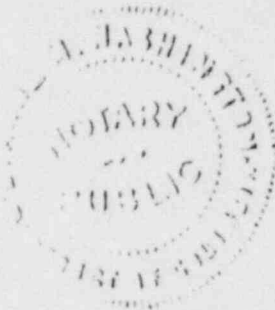
f. Identification of any instances where the Staff reported to any Board any of the block valve failures experienced in the EPRI tests, prior to UCS' Motion in this proceeding.

By

Robert D. Pollard
Robert D. Pollard

I, Robert D. Pollard, do hereby attest that the above is true and accurate to the best of my knowledge and belief.

Robert D. Pollard
Robert D. Pollard

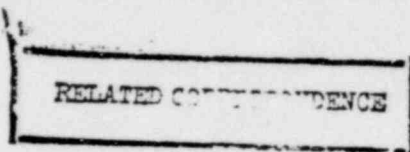
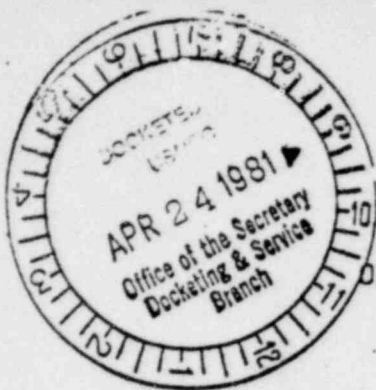


Subscribed and sworn to
before me this 22nd day
of April, 1981.

Heard M. Washington
NOTARY PUBLIC

NOTARY PUBLIC

My Commission Expires: December 11, 1984



SSIN No. 6820
Accession No.:
8011040283
IEB 81-02

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

April 9, 1981

IE Bulletin No. 81-02: FAILURE OF GATE TYPE VALVES TO CLOSE AGAINST DIFFERENTIAL PRESSURE

Description of Circumstances:

As a part of its pressurized water reactor (PWR) Safety and Relief Valve Testing Program, the Electric Power Research Institute (EPRI) conducted limited testing of a number of valves used on PWRs as power-operated relief valve (PORV) isolation or block valves. These tests indicate a number of cases in which certain of these valves failed to fully close under conditions that approximated those of their intended service (i.e., saturated steam at approximately 2,400 psi). The valves that failed to fully close are gate type motor-operated valves that may be used in various safety-related applications in addition to PORV block valves.

Background on EPRI Testing:

The proposed full-scale qualification testing of PORV block valves, with a completion date of July 1, 1982, was first provided to the utilities in a September 5, 1980, draft of NUREG-0737. The item was formally issued, with Commission approval, in NUREG-0737 on October 31, 1980.

The block valve qualification testing was proposed in NUREG-0737 primarily as an additional means of reducing the number of challenges to the emergency core cooling system and the safety valves during plant operation.

In anticipating a request for PWR block valve testing, EPRI decided to make provisions for the installation of block valves between the test steam source and the test PORV in July 1980 at the Marshall test facility. The Marshall test facility is a full-flow steam test facility owned by Duke Power Company. Test PORVs had been carefully selected, with close coordination between EPRI, its consultants and PWR utilities, to assure that PORVs representative of those in service or intended for service would be tested. However, for the block valves that have been tested concurrently, this selection process was not followed because an NRC block valve test program had not been formulated. Therefore, seven readily available valves were obtained and tested by EPRI, primarily to obtain some general baseline information on block valve closure capability.

For the block valves that were tested, EPRI had not established, at least at the time of testing, the population of plants, either operating or under construction, that might have a valve of the type needed for testing. In addition, it should be noted that the test conditions used at Marshall to date were only those that were determined to be applicable for steam testing of PORVs.

POOR ORIGINAL

These test conditions were selected after review by EPRI, utilities, and PWR NSSS vendors. NRC staff also reviewed and concurred with the test conditions. To date, there has been no similar specific determination by EPRI or the NRC staff as to the relevance of the Marshall block valve test conditions to the conditions in any specific PWR plant under which a block valve should be able to close to isolate a stuck-open PORV.

To date, EPRI has tested a total of seven PORV block valves, all at the Marshall facility. During these tests, the following valves failed to fully close during the EPRI PORV block valve testing:

1. Westinghouse Electro-Mechanical Division (W-EMD) 3-inch Valves - These valves, which are manufactured by W-EMD, can be identified by the yoke-mounted nameplates that are stamped "WESTINGHOUSE" and include "VALVE IDENT." and "VALVE I.D." numbers given in Table 1. Supplemental analyses and water testing, performed by W-EMD, determined that a 4-inch valve also would not close fully and therefore is included in this bulletin. The nameplate data on this valve are given in Table 1. These analyses and tests also determined the threshold differential pressure across the valves above which closure cannot be assured. These values are given in Table 1. A list of power reactor facilities believed to have the affected valves is given in Table 2. It is our understanding that W-EMD has notified these facilities of the failure of these valves to fully close.
2. Borg-Warner Nuclear Valve Division (BW-NVD) 3-inch 1500-pound Motor-Operated Gate Valves - These valves can be identified by BW-NVD part numbers 75460, 77910, and 79190. Supplemental testing to determine threshold differential pressures for less severe service has yet to be completed. A list of power reactor facilities believed to have the affected valves is given in Table 3. BW-NVD has submitted a 10 CFR Part 21 report in which they indicated that they have notified these facilities of the failure of these valves to fully close. (Note: Similar valves with BW-NVD part numbers 74380 and 74380-1 have been modified, retested, and demonstrated to close under test conditions. As a result, they are not included in this bulletin.)
3. Anchor Darling 3-inch 1540-pound Double-Disc Valve - This valve, the first of a series of specially designed valves, has been modified, retested, and demonstrated to close under test conditions. The remaining valves will be similarly modified during manufacture. As a result, they are not included in this bulletin.

It must be cautioned that Tables 2 and 3 may not be complete. For example, the staff is aware of one power reactor facility that obtained affected valves from another inventory. For this reason, this bulletin is applicable to all power reactor facilities with an operating license or construction permit.

The tests and analyses performed to date raise doubts as to the ability of the affected valves to close under less severe service conditions. These valves have also been supplied for utilization in a number of safety-related

applications. In the case of the W-EMD valves, they are also provided as spares or replacements through direct sales from the manufacturer. For this reason, this bulletin is applicable to the affected valves that are required to close with a differential pressure across them in safety-related systems or as PORV block valves.

The responsibility for notification and corrective actions based on adverse test results continues to lie with the utilities and vendors in the industry. NRC will continue to monitor the progress of the qualification program. All adverse test data will continue to be evaluated on a case-by-case basis. NRC staff will take appropriate action, if necessary, to assure that the necessary corrective actions are made in a timely manner.

Actions to be Taken by Licensees:

1. Within 30 days of the issuance date of this bulletin, ascertain whether any of the affected valves have been installed, or are maintained as spares for installation, where they are required to close with a differential pressure across them in safety-related systems or as PORV block valves. The differential pressures of concern include the following:
 - a. For the W-EMD manufactured valves, values in excess of the threshold values in Table 1.
 - b. For the BW-NVD valves, any value.
2. If no affected valves are identified, report this to be the case and ignore the items below.
3. If any affected valves are identified as being installed, take corrective action and evaluate the effect that failure to close under any condition requiring closure would have on system(s) operability pursuant to the facility technical specifications for continued operation.
4. If any affected valves are identified as spares, either modify the valves so that they are qualified for the intended service or obtain qualified replacements prior to installation.
5. Within 45 days of the issuance date of this bulletin, submit a report to NRC listing the affected valves identified, their service or planned service, the maximum differential pressure at which they would be required to close, the safety consequences of the valve's failure to close, the corrective action taken or planned, and the schedule for completing the corrective action.

Actions to be Taken by Construction Permit Holders:

1. Ascertain whether any of the affected valves are or will be installed or maintained as spares for installation where they are required to close

with a differential pressure across them in safety-related systems or as PORV block valves. The differential pressures of concern include the following:

- a. For the W-EMD manufactured valves, values in excess of the threshold values in Table 1.
 - b. For the BW-NVD valves, any value.
2. If no affected valves are identified, report this to be the case and ignore the items below.
 3. If any affected valves are identified, either modify the valves so that they are qualified for the intended service or obtain qualified replacements prior to startup.
 4. Within 90 days of the issuance date of this bulletin, submit a report to NRC listing the affected valves identified, their planned service, the maximum differential pressure at which they would be required to close, the safety consequences of the valve's failure to close, the corrective action taken or planned, and the schedule for completing the corrective action.

For those cases in which reports have already been submitted in accordance with the Technical Specification, 10 CFR Parts 21 and/or 50.55(e), this information need not be resubmitted. Rather, licensees or construction permit holders should reference this earlier report and submit only the additional information requested above.

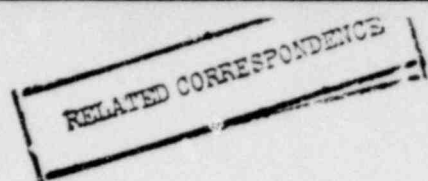
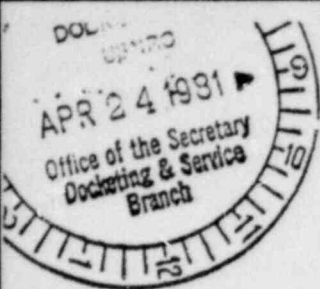
Reports, signed under oath or affirmation under the provisions of Section 182a of the Atomic Energy Act of 1954, shall be submitted to the Director of the appropriate NRC Regional Office and a copy shall be forwarded to the Director or the NRC Office of Inspection and Enforcement, Washington, D.C. 20555.

If you need additional information regarding this matter, please contact the appropriate NRC Regional Office.

This request for information was approved by GAO under blanket clearance number R0072 that expires November 30, 1983. Comments on burden and duplication should be directed to Office of Management and Budget, Room 3201, New Executive Office Building, Washington, D.C. 20503.

Attachments:

1. Table 1 - Identification of W-EMD
Manufactured Valves and Differential
Pressure Limits for Operation
2. Table 2 - Partial List of Plants With
Affected Valves Manufactured by W-EMD
3. Table 3 - Partial List of Plants With
Affected Valves Manufactured by BW-NVD
4. Recently issued IE Bulletins



Attachment 1
April 9, 1981
IEB 81-02

TABLE 1. IDENTIFICATION OF W-EMD MANUFACTURED VALVES AND
DIFFERENTIAL PRESSURE LIMITS FOR VALVE OPERATION

Nominal Valve Size (in.)	W-EMD Model Reference	"VALVE IDENT."*	"VALVE I.D."**	Δ^{***} (psid)
3	3GM88	03000GM88	3GM58 or 3GM78 or 3GM88	1500
	3GM88	03002GM88	3GM58 or 3GM78 or 3GM88	1500
	3GM99	03001GM99	3GM58 or 3GM78 or 3GM88	750
4	4GM88	04000GM88	4GM78 or 4GM88	750
	4GM88	04002GM88	4GM78 or 4GM88	750
4	4GM87	04000GM87	4GM77	750
	4GM87	04002GM87	4GM77	750

* This number is found on the yoke-mounted nameplate and occupies the first nine positions of a 24-position number. It is used in evaluating the functional ΔP requirements.

** This number is found on the yoke-mounted nameplate and occupies the first three positions of a six-position number. Valves sold as spares or replacements may not contain this number.

*** Pressure below which valve will close (as shipped).

Notes: A "position" may contain more than one character. The three-position "VALVE I.D." number consists of five digits in the three positions; for example 3 3M 78.

All nameplates have "VALVE IDENT." numbers, but those sold as spares or replacements may not have "VALVE I.D." numbers. The "VALVE IDENT." number includes the manufacturer's model reference, and the "VALVE I.D." number is a reference to the valve system application. The "VALVE I.D." number also appears on Westinghouse valve indexes and system flow diagrams. There is no reference to the "VALVE IDENT." number on these indexes or flow diagrams.

RELATIVE CORRESPONDENCE

TABLE 2. PARTIAL LIST OF PLANTS WITH
AFFECTED VALVES MANUFACTURED BY W-EMD

"VALVE IDENT." Number			
			04000GM88
			04002GM88
	03000GM88		04000GM87
	03002GM88	03001GM99	04002GM87
Plant			

Operating plants (supplied as spares or replacements except as noted):

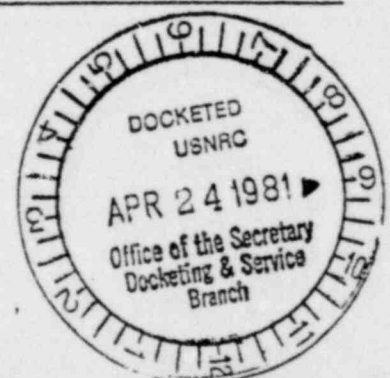
Beaver Valley 1	X		
Connecticut Yankee	X		
Farley 1, 2		X*	
Indian Point 2	X		
Kewaunee	X		
North Anna 1, 2	X		
Oconee 1, 2, 3	X		X
San Onofre 1	X		
Surry 1, 2	X	X	X
Zion 1, 2			X

Nonoperating plants (supplied as original scope of supply except as noted):

Beaver Valley 2	X		X
Braidwood 1, 2	X		X
Byron 1, 2	X		X
Callaway 1, 2	X		X
Comanche Peak 1, 2	X		X
Harris 1, 2, 3, 4		X	X
Jamesport 1, 2		X	X
Marble Hill 1, 2	X		X
San Onofre 2, 3		X**	
Seabrook 1, 2		X	X
South Texas 1, 2			X
Summer	X		X
Vogtle 1, 2		X	X
Watts Bar 1, 2	X		X
Wolf Creek	X		X

*Transferred from inventory at another plant.

**Spares or replacements.



RELATED CORRESPONDENCE

April 9, 1981
IEB 81-02

TABLE 3. PARTIAL LIST OF PLANTS WITH
AFFECTED VALVES MANUFACTURED BY BW-NVD

Plant	NVD-P/N
Arkansas Nuclear One, Unit 2	75460
Bellefonte	79190
Palo Verde	77910



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
METROPOLITAN EDISON
COMPANY, et al.,

(Three Mile Island
Nuclear Station, Unit
No. 1)

Docket No. 50-289



CERTIFICATE OF SERVICE

I hereby certify that copies of the "Union of Concerned Scientists's Reply to Met Ed and Staff Submissions on Valve Testing," and "Affidavit of Robert D. Pollard" have been mailed postage pre-paid this 22nd day of April, 1981 to the following parties:

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U.S. Nuclear Regulatory Commission
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Attn: Chief, Docketing & Service
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Cert. of Service
Docket No. 50-289

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