Nebraska Public Power District

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September 20, 1988

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Subject: Response to IE Bulletin No. 85-03, Final Report
Cooper Nuclear Station
NRC Docket No. 50-298, DPR-46

References: 1) IE Bulletin No. 85-03, dated November 15, 1985; "Motor Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings"

2) IE Bulletin No. 85-03, Supplement 1, dated April 27, 1988; "Motor Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings"

Gentlemen:

Pursuant to Action Item (f) of the above references, Nebraska Public Power District is submitting the enclosed written report on completion of the switch setting program for select motor-operated valves in the High Pressure Coolant Injection and Reactor Core Isolation Cooling Systems at Cooper Nuclear Station. No further submittals on IE Bulletin 85-03 are planned.

Should you have any questions or require additional information, please call.

Sincerely yours,

L. G. Kuncl
Nuclear Power Group Manager

LGK/mtb:dmr9/20(1A)
Enclosure

cc: Regional Administrator
USNRC - Region IV

NRC Senior Resident Inspector
Cooper Nuclear Station

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STATE OF NEBRASKA)

) ss

PLATTE COUNTY)

L. G. Kuncl, being first duly sworn, deposes and says that he is an authorized representative of the Nebraska Public Power District, a public corporation and political subdivision of the State of Nebraska; that he is duly authorized to submit this report on behalf of Nebraska Public Power District; and that the statements contained herein are true to the best of his knowledge and belief.

L. G. Kuncl

Subscribed in my presence and sworn to before me this 20th day of September, 1988.

Colleen M Kuta

Notary Public

GENERAL NOTARY-State of Nebraska
COLLEEN M. KUTA
My Comm. Exp. Aug. 4, 1989

IE BULLETIN 85-03 RESPONSE

1.0 INTRODUCTION

The objective of this report is to provide a response to the requirements of IE Bulletin 85-03 for Nebraska Public Power District's Cooper Nuclear Station (CNS). IE Bulletin 85-03 pertains to motor-operated valve common mode failures resulting from improper switch settings during plant transients and accidents. The requirements of the bulletin were broken down into two phases, which are responded to below. Phase I of the response corresponds to Action Item A of the bulletin.

2.0 PHASE I RESPONSE

Action Item A requires the licensee to identify and document the design basis for all motor-operated valves in high pressure systems, establish a tentative schedule for implementation of Phase II, and submit this information to the NRC. Nebraska Public Power District's Phase I response to the initial requirements of IE Bulletin 85-03 was submitted to the NRC on May 15, 1986 (Reference 3). On November 25, 1986, Nebraska Public Power District submitted an amended response to the initial requirements of IE Bulletin 85-03 (Reference 4), listing revisions to the maximum expected differential pressures for the bulletin motor-operated valves. These revised pressures were determined in accordance with a methodology developed by the BWR Owners Group and submitted to the NRC as Report NEDC-31322 (Reference 1). The revised response also provided additional information requested in the letter from J. E. Gagliardo to J. M. Pilant dated July 22, 1986 (Reference 6).

On April 27, 1988, the NRC issued NRC Bulletin 85-03, Supplement 1. This supplement, which is directed to license holders for boiling water reactors, was issued to clarify 1) which valves are to be included and 2) the meaning of the phrase, "....inadvertent equipment operations (such as inadvertent valve closures or openings)...." as used in the bulletin. Nebraska Public Power District sent a response to Supplement 1 to the NRC on June 2, 1988 (Reference 5). Nebraska Public Power District also participated in the BWR Owners Group response to the supplement, which was submitted to the NRC in July, 1988 as NEDC-31322, Supplement 1 (Reference 2).

3.0 PHASE II RESPONSE

Nebraska Public Power District's Phase II Response is divided into three sections. The three sections correspond to Action Items B, C, and D of IE Bulletin 85-03.

3.1 Policies and Procedures for Establishing Correct Switch Settings.

Action Item B: "Using the results of "A" above, establish the correct switch settings. This shall include a program to review and revise, as necessary, the methods for selecting and setting all switches (i.e., torque, torque bypass, position limit, overload) for each valve operation (opening and closing).

If the licensee determines that a valve is inoperable, the licensee shall also make an appropriate justification for continued operation in accordance with the applicable Technical Specification."

Response

3.1.1 Limitorque Switch Setting Policies.

a) Open torque switches.

All of the open torque switches in IE Bulletin 85-03 motor operated valves at CNS are 100% bypassed. This is accomplished by the installation of a jumper across the open torque bypass limit switch (typically, LS-5). This jumper is specified by a note on the first sheet of the General Electric elementary diagrams for the HPCI and RCIC systems.

Because the open torque switch does not exist from the electrical control circuit standpoint for these motor operated valves, an open torque switch setpoint is not applicable.

b) Open limit switches.

The open limit switch (typically, LS-4) must be adjusted to prevent inadvertent backseating of the valve.

Typically, the open limit switch will be set at approximately 8% of stroke from the open-to-close positions. It is recognized that the amount of stem travel after limit switch trip is influenced by the inertia of the motor operated valve assembly, valve design, and delay in motor contactor drop out after actuation of the open limit switch. Therefore, a generic setpoint for the open limit switch cannot be established. Instead the following process will be used:

The limit switch will be set initially for 8% of the total number of handwheel turns for a full close stroke. The valve will then by cycled open and allowed to trip electrically. Plant personnel will then place the operator in manual handwheel operation and continue to open the valve. If the valve can be opened an additional amount past the trip and coast down position, the switch is set correctly. If the valve cannot be opened past the trip and coast down position, it can be assumed that the valve has backseated. In the unlikely event that the valve has inadvertently backseated, a MOVATS signature analysis

test will be conducted per CNS Maintenance Procedure 7.3.35.1, and the stem and backseat loading and subsequent stem and backseat stress levels will be evaluated. The limit switch setting will then be increased in 2% increments and the valve will be cycled and checked until it is verified that the disc is not coasting into the backseat.

c) Open indication limit switches.

The policy to be utilized at CNS for the open indication limit switch (typically, LS-3) will be to have the open indication limit switch set at the same point as the open limit switch.

d) Open torque bypass limit switches.

For all of the IE Bulletin 85-03 motor operated valves at CNS, the open torque bypass limit switch does not exist from the electrical control circuit standpoint. Therefore, an open torque bypass limit switch setpoint is not applicable. (See Item a.)

e) Close torque switch.

The close torque switch ensures that sufficient loads are delivered to the valve stem and disk to provide leak tight closure of the valve. To establish the close torque switch setpoint, the closing thrust value for the maximum expected differential pressure conditions must be accurately established. The thrust required to overcome the maximum expected differential pressure condition was obtained from MOVATS Incorporated of Kennesaw, Georgia. The method used by MOVATS to obtain this thrust requirement is explained below.

The MOVATS differential pressure (DP) test data base contains the results of MOVs that have been tested under actual DP conditions. With sufficient data points for a particular type of valve included in the data base, it can be used to predict thrust requirements for valves of that particular type, in lieu of performing DP testing to determine the thrust requirements.

There will be sufficient data points in the data base, if there are four or more data points from valves of the same type, manufacturer, orifice diameter, and stem diameter; or if there are 20 or more data points from valves of the same type.

Linear regression is performed on the DP test data points to find the equation for the "best-fit" line through the data. After a thrust value is predicted for the valve using the "best-fit" equation, a 90% confidence band, or tolerance is calculated and then added to the predicted thrust to obtain the thrust, above running load, required by the valve to be able to operate against the maximum expected differential pressure (DP Thrust Requirement). Standard statistical analysis methods are applied for deriving the confidence interval. All data used in the calculations is available for review at MOVATS, Inc. in Kennesaw, Georgia.

After the calculated DP thrust requirement has been determined, it will be compared to the maximum allowable loading limit for the particular motor operated valve assembly. This limit is the lowest of the following four values:

1. The maximum allowable seating thrust as specified by the valve vendor.

2. The maximum thrust rating of the Limitorque operator.

3. The maximum thrust capability of the spring pack installed in the Limitorque operator.

4. The maximum reduced voltage thrust generating capability of the Limitorque operator.

The calculated closing DP thrust, plus any running load, should not exceed any of the four limits.

After an acceptable closing DP thrust (T_c) has been determined, some value must be added to reflect all of the expected instrumentation and equipment variables. These variables are as follows:

Operator/Torque Switch Repeatability	±10% (Thrust less 4000 lbs.)
	± 5% (Thrust greater than 4000 lbs.)

MOVATS Instrumentation	Accuracy
50K Load Cell	±2% of Load ±4% Linearity
200K Load Cell	±1.9% of Full Scale
Nicolet Scope	±0.2% of Voltage Range (10V)
TMD Linearity	±0.6% of 10 Volt Scale

These tolerances are combined to produce a minimum target closing DP thrust of 1.15 (T_c) for stem thrust less than 4000 lbs. and 1.10 (T_c) for stem thrust greater than 4000 lbs.

After the close torque switch has been set, the thrust at the actual trip setpoint, plus any measured running load, will be verified to be less than the maximum allowable loading limit for the particular motor operated valve assembly.

f) Close limit switches.

All of the IE Bulletin 85-03 motor operated valves at CNS are torque seated. A close limit switch is not utilized. Therefore, a close limit switch setpoint is not applicable.

g) Close indication limit switch

For those IE Bulletin 85-03 motor operated valves at CNS that have an active safety function to close (i.e., containment isolation), a special control circuit is employed that causes the close indication limit switch (typically, LS-7) to act as the close torque bypass switch for automatically actuated open-to-close operations. For this reason, the relative timing of the close indication limit switch setpoint and the close torque switch setpoint is very important. It is imperative that the close indication limit switch contacts open prior to the close torque switch contacts opening.

Typically, the close indication limit switch will be set within 3% of the total number of handwheel turns for a full valve stroke from the close-to-open positions. When setting up a motor operated valve assembly using the MOVATS equipment and Maintenance Procedure 7.3.35.1, it is possible to determine the time differential between switch actuations precisely.

h) Close torque bypass limit switches.

Typically, the close torque bypass limit switch (typically, LS-1) is of no operational concern because large hammerblow loading conditions do not occur during the initial phases of the closing cycle. For this reason, no specific requirements are placed on this switch setting relative to the valve stroke.

i) Overload relays.

The overload relays in the motor starters for all of the IE Bulletin 85-03 valves at CNS are wired for alarm only. The setpoints of the overload relays have been selected as recommended by Limitorque.

3.1.2 Switch Setting Procedures.

Cooper Nuclear Station Maintenance Procedure 7.3.36, "Limit and Torque Switch Checkout and Adjustment for Rising Stem Limitorque Motor-Operated Valves", provides directions to CNS maintenance personnel for the proper opening and closing setting of torque and limit switches in the Limitorque motor-operated valves. This procedure also serves as the switch setpoint document for the safety-related, motor-operated, rising stem valves.

3.2 Setting of Switches and Baseline Signature Analysis Testing.

Action Item C: "Individual valve settings shall be changed, as appropriate, to those established in item B above. Whether the valve setting is changed or not, the valve will be demonstrated to be operable by testing the valve at the maximum differential pressure determined in item A above with the exception that testing motor-operated valves under conditions simulating a break in the line containing the valve is not required. Otherwise, justification should be provided for any cases where testing with the maximum differential pressure cannot practicably be performed. This justification should include the alternative to maximum differential pressure testing which will be used to verify the correct settings. Each valve shall be stroke tested, to the extent practical, to verify that the settings defined in item B above have been properly implemented even if testing with differential pressure cannot be performed."

Response

NOTE: Summaries of the technical data acquired by the CNS testing program are given in tables I, II, and III (attached). The notes accompanying the tables provide further details.

3.2.1 Motor-operated valve testing during 1986 Refueling Outage at CNS.

As found signature testing was performed on all of the IE Bulletin 85-03 valves at CNS using test equipment and field engineers supplied by MOVATS Incorporated.

Thrust requirement values supplied by General Electric were used to set the close torque switch of each valve. The thrust at torque switch trip was verified by the MOVATS thrust and switch signatures taken and analyzed by MOVATS field engineers. Detailed signature analysis for all of the bulletin valves was performed by MOVATS and Detailed Analysis Reports are on file at CNS. All of the bulletin valves were found to have no immediate operational concerns in their as-left conditions. The as-found data listed in tables I, II, and III (attached) was obtained by the MOVATS testing performed during the 1986 Refueling Outage.

3.2.2 IE Bulletin 85-03 engineering and training activities in preparation for the 1988 Refueling Outage.

MOVATS testing equipment and software were purchased by Nebraska Public Power District to give CNS the in-house capability to perform testing and detailed signature analysis. Seven CNS personnel completed the MOVATS Data Acquisition Training Course at the MOVATS Training Center. Additionally, two CNS Engineering Department personnel completed the MOVATS Signature Analysis Training Course at the MOVATS Training Center.

Maximum allowable seating and backseating thrust calculations for the IE Bulletin 85-03 valves were purchased from the Anchor Darling Valve Company and from Crane Valve Company.

General Electric had devised a plan (CNS Special Test Procedure 86-022) to perform differential pressure testing on seven of the bulletin valves in order to verify the thrust requirement calculations that had been used to set the close torque switches during the 1986 Refueling Outage. A subsequent detailed review of the DP test plan raised questions as to its adequacy to satisfy the requirements of the bulletin. Also, as the industry data base of differential testing results grew, thrust requirement calculations based on valve manufacturers' and Limitorque's formulations were proving not to be adequate. Accordingly, the reported favorable response from the NRC to the proposed plan of the Union Electric Company to substitute thrust requirement calculations based on the MOVATS data base for actual DP testing at their Callaway plant, led to the Nebraska Public Power District decision to pursue this alternative approach. Data base thrust calculations were subsequently secured from MOVATS for all of the CNS bulletin valves and the justification for the alternative to differential pressure testing at CNS is delineated in the Switch Setting Policy for close torque switch in 3.1.1.d. above.

3.2.3 Motor-operated valve testing during 1988 Refueling Outage at CNS.

Baseline signature analysis tests were performed on all of the bulletin valves at CNS. The testing was accomplished as directed by and documented by CNS Maintenance Procedure 7.3.35.1, "Testing of Motor-Operated Valves Using Motor-Operated Valve Analysis", and conducted by CNS personnel who had successfully completed training at the MOVATS Training Center.

The thrust and switch signatures for each valve were used to ensure that the as-left thrust at the close torque switch trip was in excess of the minimum target thrust requirement. The as-found (1986) and as-left (1988) data for the bulletin valves is summarized in tables I, II, and III (attached).

3.3 Procedures to Ensure That Correct Switch Settings Are Maintained Throughout the Life of the Plant.

Action Item D: "Prepare or revise procedures to ensure that correct switch settings are determined and maintained throughout the life of the plant. Ensure that applicable industry recommendations are considered in the preparation of these procedures."

Response

3.3.1 The MOVATS Motor Load Unit (MLU) and Motor Torque Unit (MTU).

The MLU measures motor output power which is proportional to the thrust applied to the valve stem. The MLU is applicable only to alternating current motors. The MTU measures motor output torque which is proportional to the thrust applied to the valve stem. The MTU is applicable only to direct current motors. There are several characteristics of the MLU and MTU that make them ideal for monitoring changes in a valve's condition. Since the signatures are taken from the motor control center and require no valve contact, they are convenient to obtain. MLU and MTU measurements are sensitive and repeatable; therefore, they can be used to observe and/or measure small changes in running thrust load, including loads that are less than preload.

MLU or MTU signatures have been taken with the valve in a known condition, subsequent MLU or MTU signatures can be taken on a periodic basis and observed for changes indicative of degrading conditions. After MLU or MTU baseline signatures have been taken and recorded, the MLU and MTU can be used to establish a threshold value. If the thrust required to overcome max .a differential

pressure conditions is subtracted from the available thrust measured at torque switch trip, the result is the maximum allowable running load or threshold load.

When the valve is tested from its motor load center, the average running load on the MLU or MTU signature is compared to the threshold value and to the baseline running load. If the running load exceeds the threshold value, the valve may not fully operate to its required position under maximum differential pressure accident conditions and further testing and/or corrective maintenance would be required.

3.3.2 Preventive maintenance procedures for periodic monitoring of running thrust loading.

Maintenance Procedure 7.3.35.2, "Periodic Monitoring of Motor-Operated Valves Using the MOVATS Motor Load Unit", and Maintenance Procedure 7.3.35.3, "Periodic Monitoring of Motor-Operated Valves Using the MOVATS Motor Torque Unit", will provide direction to CNS personnel for monitoring MOV running thrust loading from the motor control center to ensure that the MOV is still capable of overcoming accident differential pressures to perform their safety-related functions. The testing will be conducted and MLU or MTU and control switch signatures recorded, trended, and analyzed once each two refueling cycles. For those IE Bulletin 85-03 valves listed in tables I and II (attached), these preventive maintenance procedures will be initially implemented during the CNS Refueling Outage that is tentatively scheduled for the Spring of 1990.

Maintenance Procedures 7.3.3.52 and 7.3.35.3 are currently being developed and will be completed, reviewed, and approved by January 1, 1989. When approved, these two procedures will be entered in the CNS Preventive Maintenance Program.

3.3.3 Testing frequency requirements.

There are three basic levels of MOVATS testing that will be performed at CNS.

Level I: The complete baseline signature analysis test (Maintenance Procedure 7.3.35.1) will be performed under the following circumstances:

A. The MLU or MTU threshold value is exceeded during periodic testing at the motor control center.

B. Spring pack replacement, disassembly, or adjustment.

Level II: The thrust measurement test (Maintenance Procedure 7.3.35.1 - excluding the spring pack calibration portion) will be performed under the following circumstances.

A. Following torque switch adjustment.

B. Following torque switch replacement.

Level III: The MLU or MTU test from the motor control center (Maintenance Procedure 7.3.35.2 or 7.3.35.3) will be performed every second refueling outage as stated in 3.3.2 above.

3.3.4 Post-Maintenance testing.

For all other motor-operated valve maintenance activities not addressed by 3.3.3 above, post-maintenance testing requirements will be those of ASME Section XI.

4.0 REFERENCES

1. General Electric BWR Owners Group Report on the Operational Design Basis of Selected Safety-Related Motor-Operated Valves, NEDC-31322, dated September, 1986.

2. General Electric BWR Owners Group Report on the Operational Design Basis of Selected Safety-Related Motor-Operated Valves, NEDC-31322, Supplement 1, dated July, 1988.

3. NPPD Response to Initial Requirements of IE Bulletin 85-03, dated May 15, 1986.

4. NPPD Response to Initial Requirements of IE Bulletin 85-03, dated November 28, 1986.

5. Letter from L. G. Kuncl (NPPD) to U.S. Nuclear Regulatory Commission, dated June 2, 1988.

6. Letter from J. E. Gagliardo (NRC) to J. M. Pilant (NPPD), dated July 22, 1986.

TABLE I - RCIC SYSTEM

IE BULLETIN 85-03 RESPONSE - COOPER NUCLEAR STATION

COMPONENT ID CODE	VALVE DESC.	OPERATOR DESCRIPTION	FUNCTION	DESIGN DP	MAX DP	THRUST REQUIRED	TORQUE SW.SET	THRUST AT TOR. SWITCH TRIP (4)	AS FOUND OPERABILITY
RCIC-MOV-M015	Anchor 3" Gate	Limitorque SMB-000/5'#	Steam Supply Inboard Isolation	1146	O: 1091 C: 1091	O: 7126 C: 6154	AF: 2.0 AL: 3.75	As Found: 2900 As Left: 7280	No
RCIC-MOV-M016	Anchor 3" Gate	Limitorque SMB-000/5'#	Steam Supply Outboard Isolation	1146	O: 1091 C: 1091	O: 7126 C: 6154	AF: 2.5 AL: 3.75	As Found: 3880 As Left: 6878	No
RCIC-MOV-M018	Anchor 6" Gate	Limitorque SMB-000/5'#	Supply From ECST	50	O: 29 C: 14	O: 2185 C: 2438	AF: 1.5 AL: 1.5	As Found: 3180 As Left: 2840	Yes
RCIC-MOV-M020	Anchor 4" Gate	Limitorque SMB-00/10'#	Discharge Block Valve	1925	O: 1222	O: 9839	N/A	14,000 (1) 21,446 (2)	Yes
RCIC-MOV-M021	Anchor 4" Gate	Limitorque SMB-00/10'#	Injection Valve	1925	O: 1222	O: 9839	N/A	14,000 (1) 27,462 (2)	Yes
RCIC-MOV-M027	Crane 2" Globe	Limitorque SMB-00/15'#	Minimum Flow to Torus	1500	O: 1325 C: 1338	O: 7665 C: 7665	AF: 1.5 AL: 1.75	As Found: 14620 As Left: 9380	Yes
RCIC-MOV-M030	Anchor 4" Globe	Limitorque SMB-0/15'#	Test Return to ECST	1925	C: 1230 (3)	C: 14043	AF: 1.75 AL: 2.0	As Found: 15440 As Left: 17800	Yes
RCIC-MOV-M041	Anchor 6" Gate	Limitorque SMB-000/5'#	Supply from Torus	50	O: 88 C: 65	O: 4778 C: 2999	AF: 1.5 AL: 1.5	As Found: 3200 As Left: 4140	Yes
RCIC-MOV-M131	Anchor 3" Globe	Limitorque SMB-00/10'#	Steam Supply to Turbine	1146	O: 1091	O: 9469	N/A	14,000 (1) 29,877 (2)	Yes
RCIC-MOV-M132	Crane 2" Globe	Limitorque SMB-000/5'#	Auxiliary Cooling Water Supply	1500	O: 1311	O: 7632	N/A	8,000 (1) 36,729 (2)	Yes

TABLE I - RCIC SYSTEM (Continued)

NOTES:

1. MOVs only safety-related function is to open. The open torque switch is 100% bypassed. This number is the thrust rating of the Limitorque operator.

2. MOVs only safety-related function is to open. The open torque switch is 100% bypassed. This number is the reduced voltage stall thrust capability of the Limitorque operator.

3. The maximum DP listed in Reference 5 was 1299 psi, and was derived from the RCIC pump discharge pressure at the minimum flow rate of 50 gpm. The value used to determine the maximum required thrust for the closing of this valve due to an inadvertent operation was 1230 psi and was derived from the RCIC pump discharge pressure at rated flow and speed. It was assumed that the Control Room operators starts to close the test return valve before the injection valve starts to open and all of the system flow is through the test return line.

4. All of the as-found and as-left torque switch settings and thrust at torque switch trip values listed are for the open to close direction. All of the open torque switches in the Bulletin 85-03 MOVs are 100% bypassed.

TABLE II - HPCI SYSTEM

IE BULLETIN 85-03 RESPONSE - COOPER NUCLEAR STATION

COMPONENT ID CODE	VALVE DESC.	OPERATOR DESCRIPTION	FUNCTION	DESIGN DP	MAX DP	THRUST REQUIRED	TORQUE SW.SET	THRUST AT TOR. SWITCH TRIP (4)	AS FOUND OPERABILITY
HPCI-MOV-MO14	Anchor 10" Gate	Limitorque SB-1/60'#	Steam Supply to Turbine	1146	O: 1091	O: 33892	N/A	45,000 (1) 54,743 (2)	Yes
HPCI-MOV-MO15	Anchor 10" Gate	Limitorque SMB-1/25'#	Steam Supply Inboard Isolation	1146	O: 1091 C: 1091	O: 33892 C. 30184	AF: 3.0 AL: 3.0	As Found: 33960 As Left: 39416	Yes
HPCI-MOV-MO16	Anchor 10" Gate	Limitorque SMB-1/40'#	Steam Supply Outboard Isolation	1146	O: 1091 C: 1091	O: 33892 C: 30184	AF: 2.0 AL: 2.5	As Found: 17980 As Left: 37723	No
HPCI-MOV-MO17	Anchor 16" Gate	Limitorque SMB-00/15'#	Supply From ECST	150	C: 14 (4)	C: 3179	AF: 1.0 AL: 1.0	As Found: 6630 As Left: 8717	Yes
HPCI-MOV-MO19	Anchor 14" Gate	Limitorque SB-3/150'#	Injection Valve	1925	O: 1118	O: 56724	N/A	140,000 (1) 287,576 (2)	Yes
HPCI-MOV-MO20	Anchor 14" Gate	Limitorque SB-3/150'#	Discharge Block Valve	1925	O: 1113 (3)	O: 56724	N/A	140,000 (1) 287,576 (2)	Yes
HPCI-MOV-MO21	Anchor 14" Globe	Limitorque SMB-3/150'#	Test Return to ECST	1925	C: 1245 (5)	C: 63458	AF: 2.25 AL: 2.25	As Found: 76200 As Left: 75800	Yes
HPCI-MOV-MO25	Anchor 4"	Limitorque SB-1/40'#	Minimum Flow to Torus	1500	O: 1326 C: 1340	O: 14781 C: 14781	AF: 1.75 AL: 1.0	As Found: 11560 As Left: 18940	No
HPCI-MOV-MO58	Anchor 16" Gate	Limitorque SMB-00/15'#	Supply from Torus	150	O: 98 C: 64	O: 12123 C: 6402	AF: 3.0 AL: 2.0	As Found: 10720 As Left: 9140	Yes

TABLE II - HPCI SYSTEM (Continued)

NOTES:

1. MOVs only safety-related function is to open. The open torque switch is 100% bypassed. This number is the thrust rating of the Limitorque operator.

2. MOVs only safety-related function is to open. The open torque switch is 100% bypassed. This number is the reduced voltage stall thrust capability of the Limitorque operator.

3. The maximum DP value listed in Reference 5 was 1118 psi, and was derived using the formula for the HPCI injection valve from Reference 1. The formula for the HPCI pump discharge valve from Reference 2 yields the listed value.

4. Reference 2 provides a formula for determining the maximum DP in the opening direction for this valve because of possible inadvertent closure by the Control Room operator. At CNS, such an inadvertent closure is not possible because of an electrical interlock between the two HPCI suction valves. This interlock makes it impossible to close either of the suction valves unless the other suction valve is open.

5. The maximum DP value listed in Reference 5 was 1284 psi, and was derived from the HPCI pump discharge pressure at the minimum flow rate of 450 gpm. The value used to determine the maximum required thrust for the closing of this valve due to an inadvertent operation was 1245 psi and was derived from HPCI pump discharge pressure at rated flow and speed. It was assumed that the Control Room operator starts to close the test return valve before the injection valve starts to open and all of the system flow is through the test return line.

6. All of the as-found and as-left torque switch settings and thrust at torque switch trip values listed are for the open to close direction. All of the open torque switches in the Bulletin 85-03 MOVs are 100% bypassed.

TABLE III - AS-FOUND OPERABILITY SUMMARY

IE BULLETIN 85-03 RESPONSE - COOPER NUCLEAR STATION

COMPONENT ID CODE	REQUIRED FUNCTION	LIMITING PARAMETER (1)	MAXIMUM DP THRUST REQ.	AS-FOUND STATUS (2)	AS-FOUND OPERABILITY
RCIC-MOV-MO15	Open	Stall Thrust	7,126#	7,920#	Yes
	Close	T.S. Setting	6,154#	2,900#	No
RCIC-MOV-MO16	Open	Stall Thrust	7,126#	25,048#	Yes
	Close	T.S. Setting	6,154#	3,880#	No
RCIC-MOV-MO18	Open	Stall Thrust	3,650#	15,103#	Yes
	Close	T.S. Setting	2,438#	3,180#	Yes
RCIC-MOV-MO20	Open	Stall Thrust	9,839#	21,466#	Yes
RCIC-MOV-MO21	Open	Stall Thrust	9,839#	27,462#	Yes
RCIC-MOV-MO27	Open	Stall Thrust	(3) 7,665#	31,000#	Yes
	Close	T.S. Setting	7,665#	14,620#	Yes
RCIC-MOV-MO30	Close	T.S. Setting	14,043#	15,440#	Yes
RCIC-MOV-MO41	Open	Stall Thrust	4,778#	15,103#	Yes
	Close	T.S. Setting	2,999#	3,200#	Yes
RCIC-MOV-MO131	Open	Stall Thrust	(3) 9,469#	29,877#	Yes
RCIC-MOV-MO132	Open	Stall Thrust	(3) 7,632#	36,729#	Yes
HPCI-MOV-MO14	Open	Stall Thrust	33,892#	54,743#	Yes
HPCI-MOV-MO15	Open	Stall Thrust	33,892#	36,123#	Yes
	Close	T.S. Setting	30,184#	33,950#	Yes
HPCI-MOV-MO16	Open	Stall Thrust	33,892#	88,446#	Yes
	Close	T.S. Setting	30,184#	17,980#	No

TABLE III - AS-FOUND OPERABILITY SUMMARY (Continued)

COMPONENT ID CODE	REQUIRED FUNCTION	LIMITING PARAMETER (1)	MAXIMUM DP THRUST REQ.	AS-FOUND STATUS (2)	AS-FOUND OPERABILITY
HPCI-MOV-M017	Close	T.S. Setting	3,179#	6,600#	Yes
HPCI-MOV-M019	Open	Stall Thrust	56,724#	287,576#	Yes
HPCI-MOV-M020	Open	Stall Thrust	56,724#	287,576#	Yes
HPCI-MOV-M021	Close	T.S. Setting	63,458#	76,200#	Yes
HPCI-MOV-M025	Open	Stall Thrust	(3) 14,781#	59,563#	Yes
	Close	T.S. Setting	14,781#	11,560#	No
HPCI-MOV-M058	Open	Stall Thrust	12,123#	38,859#	Yes
	Close	T.S. Setting	6,402#	10,720#	Yes

NOTES:

1. For those valves with a safety-related function to close, the limiting parameter is the thrust generated at the trip point of the close torque switch. For those valves with a safety-related function to open, the limiting parameter is the operator's reduced voltage stall thrust capability. Because the open torque switch is 100% bypassed, the operator will supply the thrust required up to the point of motor stall. The CNS Plant Engineering Department has verified that the maximum required DP thrust, for the close to open direction, does not exceed the maximum thrust rating of the Limitorque operator.

2. For the open to close direction, the as-found status is based on the thrust measured at the trip point of the close torque switch, during the 1986 Outage. This measurement was taken prior to any adjustments, maintenance, or modifications to the MOVs.

   For the close to open direction, the as-found status is based on the reduced voltage stall thrust capability of the MOV.

3. For globe valves with flow under the seat, opening DP thrust requirements are typically zero. However, to be conservative, the same DP thrust values determined for the close direction have been used for the open direction.