Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

September 5, 1991

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Attn: Document Control Desk

Subject: Commonwealth Edison Response to Request for Additional Information (RAI) for Generic Letter 89-10 Supplement 3

Dresden Units 2 and 3,
NRC Docket Numbers 50-237/249
Quad Cities Units 1 and 2,
NRC Docket Numbers 50-254/265
LaSalle Units 1 and 2,
NRC Docket Numbers 50-373/374

References:
(a) NRC Generic Letter 89-10, Safety-Related Motor Operated Valve Testing and Surveillance dated June 28, 1989

(b) NRC Generic Letter 89-10 Supplement 3, Consideration of the Results of NRC Sponsored Tests of Motor Operated Valves, Dated October 25, 1990, Received November 13, 1990

(c) D.L. Taylor Letter to U.S. NRC dated December 12, 1990

(d) D.L. Taylor to U.S. NRC dated March 11, 1991

(e) L.N. Olshan letter to T.J. Kovach dated July 2, 1991

(f) August 14, 1991 Teleconference, CECo (D.J. Chrzanowski and D.L. Taylor and L.N. Olshan)

Dear Dr. Murley:

NRC Generic Letter 89-10 (Generic Letter) extended the recommendations outlined in Bulletin 85-03 and its supplement to all safety-related motor-operated valves (MOV) and position-changeable MOVs in safety-related systems.

A064
1/1

Supplement 3 to the Generic Letter (Reference (b)) indicated that the information recently obtained from NRC-sponsored MOV tests might affect the priorities being established by licenses for implementing their generic letter programs. From their evaluation of the MOV data provided by the BWR Owners' Group of the NRC-sponsored tests, the NRC staff determined that correction of any deficiencies in the HPCI, RCIC, RWCU and Isolation condenser MOVs described in the supplement needed to be given high priority in the implementation of generic letter programs.

Reference (c) provided the required Commonwealth Edison Company (CECo) 30 day response to Generic Letter 89-10 Supplement 3. The reference indicated that CECo had as requested, prepared and placed on site, plant specific safety assessments addressing the concerns of the Generic Letter supplement. Additionally, Reference (c) indicated that CECo had determined that there were no MOVs with potential deficiencies which have a greater safety significance than the HPCI, RCIC, RWCU and isolation condenser MOVs addressed in the Supplement.

Reference (b) additionally requested that CECo, within 120 days of receipt of the GL, provide to the NRC staff the following:

a. Criteria, reflecting operating experience and the latest test data, that were applied in determining whether deficiencies exist in the subject HPCI, RCIC and RWCU MOVs and, in the MOVs in isolation condenser lines;

b. The identification of any MOVs found to have deficiencies; and

c. A schedule for any necessary corrective action.

Additionally, Reference (b) directed CECo to submit plant specific safety assessments and request staff approval if completion of corrective actions was scheduled to occur beyond the 18 month or 1 refueling outage time frame indicated in the Supplement.

Reference (d) provided the 120 day response to Generic Letter 89-10 Supplement 3 for Dresden, Quad Cities and LaSalle Station respectively.

Reference (e) requested that CECo provide additional information to support the safety determination regarding the Supplement 3 response.

The RAI originally requested a 30 day response, in the reference (f) phone conversation, NRR granted an extension for the response to September 6, 1991.

CECo has re-evaluated the criteria used to determine deficiencies in the population of valves defined by GL 89-10 Supplement 3. This re-evaluation has resulted in a reduction of valves determined to be deficient.

The GL 89-10 Supplement 3 valves were originally evaluated using conservatively interpreted INEL test data with the addition of conservative design margin. Using this criteria, marginally acceptable valves were assessed as deficient. The revised acceptance criteria takes advantage of the conservative margin.

Attachment 1 provides a list of blowdown valves with a revised assessment of each valve. Attachment 1 also contains a schedule for the modifications needed to eliminate the deficiencies as well as a schedule for proposed long-term modifications which will provide additional design margin.

Attachment 2 provides a response to additional NRC questions about GL 89-10 Supplement 3 valves as requested by reference (e). Attachment 3 provides data needed to assess MOV motor capabilities as requested by the NRC.

To the best of my knowledge and belief, the statements contained in this document are true and correct. In some respect these statements are not based on my personal knowledge, but on information furnished by other CECo employees, contractor employees, and consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

If there are any questions or comments, please contact me at (708) 515-7292.

Sincerely,

D. J. Chrzanowski

David J. Chrzanowski
Generic Issues Administrator

cc: A. Bert Davis, Regional Administrator - RIII
R. Pulsifer, Project Manager - NRR
B. Siegel, Project Manager - NRR
L. Olshan, Project Manager - NRR
W. Rogers, Senior Resident Inspector - Dresden
T. Tongue, Senior Resident Inspector - LaSalle
T. Taylor, Senior Resident Inspector - Quad Cities

State of Ill, County of Cook
Signed before me on this 5th day
of September, 1991 by DJC
Notary Public [signature]

" OFFICIAL SEAL "
SANDRA C. LARA
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 6/25/94

/scl:1114:8

LASALLE STATION BLOWDOWN VALVES (Unit 1)

System	Valve #	Actuator	Status	Changes Required to Eliminate Deficiencies	Parameter used to remove conservatism for this assessment	Resolved within 18 months	*Proposed changes needed to restore additional design margin	Schedule for Long Term Enhancements
Unit 1 RWCU (G33)	F001 (6" Valves)	SMB-00-7.5	Deficient	1. Larger Actuator 2. Cable Repl.	—	No (10/92)	1. Replace valve 2. SMB-1-25	(10/92)
	F004 (6" Valves)	SMB-00-7.5	Non-Deficient	—	1. Torque switch by-pass to 95% of travel. 2. Kalsi actuator rating 3. Reduce the stem factor to 0.15 taking credit for stem lubrication every outage. 4. Limit MOVs to 100 cycles	—	1. Replace valve 2. SMB-1-25	(10/92)
Unit 1 RCIC	F008 (4" Valve)	SMB-00-10	Non-Deficient	—	1. Torque switch by-pass to 95% of travel. 2. Reduce the stem factor to 0.15 taking credit for stem lubrication every outage.	—	1. Replace valve 2. SMB-1-25	(10/[illegible]
	F063 (10" Valve)	SMB-1-25	Deficient	1. Gear change/ tech spec closure time extension to 50 sec. 2. Larger Actuator 3. Cable Repl.	—	No 10/92	1. Replace valve 2. SMB-2-25	(10/92)
	F064 (10" Valves)	SMB-1-25	Non-Deficient	—	1. Valve taken out-of-service	—	1. Replace valve 2. SMB-2-25 3. Gear change/time extension to 50 sec.	(10/92)

Note: All valves are Anchor/Darling split wedge gates. A valve factor of 0.50 was used to evaluate the status of these valves.
*Propose long-term modifications are subject to change based on failure evaluation and/or testing.

LASALLE STATION BLOWDOWN VALVES (Unit 2)

System	Valve #	Actuator	Status	Changes Required to Eliminate Deficiencies	Parameter used to remove Conservatism for this assessment	Resolved within 18 Months	*Proposed changes needed to restore additional design margin	Schedule for Long Term Enhancements
Unit 2 RWCU (G33)	F001 (6" Valves)	SMB-00-7.5	Deficient	1. Larger Actuator 2. Cable Repl.	—	No (10/93)	1. Replace valve 2. SMB-1-25	(10/93)
	F004 (6" Valves)	SMB-00-7.5	Non-Deficient	—	1. Torque switch by-pass to 95% of travel into 2. Kalsi actuator rating 3. Reduce the stem factor to 0.15 taking credit for stem lubrication every outage. 4. Limit MOV to 100 cycles.	—	1. Replace valve 2. SMB-1-25	(10/93)
Unit 2 RCIC	F008 (4" Valve)	SMB-00-10	Non-Deficient	—	1. Torque switch by-pass to 95% of travel. 2. Reduce the stem factor to 0.15 taking credit for stem lubrication every outage.	—	1. Replace valve 2. SMB-1-25	(10/
	F063 (10" Valve)	SMB-1-25	Deficient	1. Gear Change/ tech spec closure time extension to 50 sec. 2. Larger actuator. 3. Cable Repl.	—	No (10/93)	1. Replace valve 2. SMB-2-25	(10/93)
	F064 (10" Valves)	SMB-1-25	Non-Deficient	—	1. Valve taken out-of-service	—	1. Replace valve 2. SMB-2-25 3. Gear change/time extension to 50 sec.	(10/93)

Note: All valves are Anchor/Darling split wedge gates. A valve factor of 0.50 was used to evaluate the status of these valves.
*Propose long-term modification are subject to change based on future evaluation and/or testing.

QUAD CITIES BLOWDOWN VALVES

System	Valve #	Existing Actuator	Status	Changes Required to Eliminate Deficiencies	Parameters used to removed consercatism for this assessment	Resolved within 18 months	*Proposed changes needed to restore additional design margins	Schedule for Long Term Enhancements
(Unit 1) RWCU	1201-2 (6" valves)	SMB-00-15	Deficient	1. By-pass torque switch	1. Torque switch by-pass 95% in the closing direction. 2. Kalsi Acutator Rating evaluation. 3. Reduced stem factor to 0.15 taking credit for stem lubrication every outage. 4. Limit MOV to 50 cycles.	No (10/92)	1. Replace Valve 2. SMB-1-25 3. Cable Replacement	(10/92)
	1201-5 (6" Valves)	SMB-00-15	Deficient	1. By-pass torque switch	1. Torque switch bypass 95% in the closing direction. 2. Kalsi Actuator Rating Evaluation. 3. Reduce stem factor to 0.15 taking credit for stem lubrication every outage 4. Limit MOV to 50 cycles.	No (10/92)	1. SMB-1-25 2. Cable replacement 3. (Valve has been replaced)	(10/92)
(Unit 1) RCIC	1301-16 (3" Valves)	SMB-000-5	Non-Deficient	—	1. Reduce stem factor to 0.15 taking credit for stem lubrication every outage.	—	—	—
	1301-17 (3" Valves)	SMB-00-7.5	Non-Deficient	—	1. Reduce stem factor to 0.15 taking credit for stem lubrication every outage.	—	—	—
(Unit 1) HPCI	2301-4 (10" Valves)	SMB-1-40	Non-Deficient	—	1. Reduce stem factor to 0.15 taking credit for stem lubrication every outage.			
	2301-5 (10" Valves)	SMB-1-60	Non-Deficient	—	1. Reduce Stem Factor to 0.15 taking credit for stem lubrication every outage. 2. Limit MOV to 100 cycles 3. Kalsi Actuator Rating Evaluation	—	1. SMB-2-60	(9/92)

Note 1: *Proposed modifications are subject to change based on future evaluation or testing. All valves are Crane Valves except for the inboard RWCU valves, these valves are new Anchor-Darling double-disk gate valves.

Note 2: The outboard RWCU valves will be replaced by Anchor-Darling double disk gates because of leakage concerns. The following valve factors were used to evaluate the status of the blowdown valves: Crane Valves = 0.40 valve factor.
Anchor/Darling Valves = 0.50 valve factor.

QUAD CITIES BLOWDOWN VALVES (Unit 2)

System	Valve #	Existing Actuator	Status	Changes Required to Eliminate Deficiencies	Parameters used to remove consercatism for this assessment	Resolved within 18 months	*Proposed changes needed to restore additional design margins	Schedule for Long Term Enhancements
(Unit 2) RWCU	1201-2 (6" valves)	SMB-00-10	Deficient	1. By-pass torque switch 2. Larger motor	1. Torque switch by-pass 95% in closing direction. 2. Kalsi Actuator Rating Evaluator. 3. Reduced stem factor to 0.15 taking credit for stem lubrication every outage. 4. Limit MOV to 50 cycles.	yes (1/92)	1. Replace Valve 2. SMB-1-25	(3/93)
	1201-5 (6" Valves)	SMB-00-15	Deficient	1. By-pass torque switch	1. Torque switch bypass 95% in the closing direction. 2. Kalsi Actuator Rating Evaluation. 3. Reduce stem factor to 0.15 taking credit for stem lubrication every outage 4. Limit MOV to 50 cycles.	yes (1/92)	1. SMB-1-25 2. Cable replacement 3. (Valve has been replaced)	(3/93)
(Unit 2) RCIC	1301-16 (3" Valves)	SMB-000-5	Non-Deficient	—	1. Reduce Stem Factor to 0.15 taking credit for stem lubrication every outage.	—	—	—
	1301-17 (3" Valves)	SMB-00-7.5	Non-Deficient	—	1. Reduce Stem Factor to 0.15 taking credit for stem lubrication every outage.	—	—	—
	2301-4 (10" Valves)	SMB-1-40	Non-Deficient	—	1. Reduce Stem Factor to 0.15 taking credit for stem lubrication every outage.	—	—	—
	2301-5 (10" Valves)	SMB-1-60	Non-Deficient	—	1. Reduce Stem Factor to 0.15 taking credit for stem lubrication every outage. 2. Limit MOV to 100 cycles. 3. Kalsi Actuator Rating Evaluation.	—	1. SMB-2-60	(3/93)

Note 1: *Proposed modifications are subject to changes based on future evaluation or testing. All valves are Crane Valves except for the inboard RWCU valves, these valves are new Anchor-Darling double-disk gate valves.

The outboard RWCU valves will be replaced by Anchor-Darling double disk gates because of leakage concerns. The following valve factors were used to evaluate the status of the blowdown valves: Crane Valves - 0.40 valve factor.

DRESDEN STATION BLOWDOWN VALVES (Unit 2)

System	Valve #	Actuator	Status	Change Required to Eliminate Deficiencies	Parameters used to remove conservatism for this assessment	Resolved within 18 months	*Proposed changes needed to restore additional design margin	Schedule for Long Term Enhancements
(Unit 2) RWCU	1201-1 (8" Valves)	SMB-0-40	Deficient	1. Torque switch setting	1. Kalsi Actuator Rating Evaluation 2. Limit MOV to 50 cycles. 3. Reduce the stem factor to 0.15 taking credit for stem lubrication.	No (9/92)	1. SMB-1-60 2. Cable replacement	(9/92)
	1201-2 (8" Valves)	SMB-1-60	Non-Deficient	—	1. Reduce the stem factor to 0.15 taking credit for stem lubrication.		1. SMB-2-60	(9/92)
(Unit 2) Isolation Condenser	1301-1 (14" Valves)	SMB-2-60	Deficient	1. Larger Actuator 2. Cable relacement 3. Gear change/ tech/spec closure time extension to 50 sec.		No (9/92)	1. SMB-3-150 2. Cable replacement 3. Stem Replacement	(9/92)
	1301-2 (14" Valves)	SMB-3-80	Deficient	1. Torque Switch Setting	1. Reduce the stem factor to 0.15 taking credit for stem lubrication.	No (9/92)	1. Gear change/ Tech Spec closure time extension to 50 seconds.	(9/92)
	1301-3 (12" Valves)	SMB-2-80	Non-Deficient	—	1. Reduce the stem factor to 0.15 taking credit for stem lubrication.	—	1. Gear Change	(9/92)
	1301-4 (12" Valves)	SMB-2-60	* Deficient	1. Gear change	1. Reduce the stem factor to 0.15 taking credit for stem lubrication.	No (9/92)	1. SMB-3-150 2. Gear change/Tech Spec Closure time extension to 50 sec. 3. Cable replacement. 4. Stem replacement.	(9/92)
(Unit 2) HPCI	2301-4 (10" Valves)	SMB-1-60	Non-Deficient	—	1. Reduce the stem factor to 0.15 taking credit for stem lubrication. 2. Limit MOV to 50 cycles.		1. SMB-2-25 2. Gear change/tech spec closure time extension to 50 sec. 3. Cable replacement	(9/92)
	2301-5 (10" Valves)	SMB-3-60	Non-Deficient	—	1. Reduce the stem factor to 0.15 taking credit for stem lubrication.	—	1. Gear change/Tech spec closure time to 50 sec.	(9/92)

Note #1: All valves are Crane Valves except for the Unit 3 RWCU valves.
Note #2: The following valve factors were used to evaluate the status of the blowdown valves:
Crane Valves = 0.40 valve factor
Anchor/Darling Valves = 0.50 valve factor
* Proposed long-term modifications are subject to change on future evaluation and/or testing.

DRESDEN STATION BLOWDOWN VALVES (Unit 3)

System	Valve #	Actuator	Status	Changes to Eliminate Deficiencies	Parameters used to remove conservatism for this assessment	Resolved within 18 months	*Proposed changes needed to restore additional design margin	Schedule for Long Term Enhancements
(Unit 3) RWCU	1201-1 (8" Valves)	SMB-0-40	Deficient	1. Torque switch setting	1. Kalsi Actuator Rating Evaluation 2. Limit MOV to 50 cycles 3. Reduce the stem factor to 0.15 taking credit for stem lubrication.	yes (9/91)	1. SMB-1-60 2. Cable replacement 3. Valve Replacement	(3/93)
	1201-2 (8" Valves)	SMB-1-60	Non-Deficient	—	—	—	1. SMB-2-60 2. Valve replacement.	(3/93)
(Unit 3) Isolation Condenser	1301-1 (14" Valves)	SMB-2-60	* Deficient	1. Gear change/ tech spec closure time extension to 50 seconds. 2. Larger Actuator 3. Cable replacement	—	no (3/93)	1. SMB-3-150 2. Gear change/ Tech Spec closure time extension 50 sec. 3. Cable replacement 4. Stem Replacement	(3/93)
	1301-2 (14" Valves)	SMB-3-80	Deficient	1. Torque switch setting.	1. Reduce the stem factor to 0.15 taking credit for stem lubrication.	yes (9/91)	1. Gear change/ Tech Spec closure time extension to 50 seconds.	(3/93)
	1301-3 (12" Valves)	SMB-2-80	Non-Deficient	—	1. Reduce the stem factor to 0.15 taking credit for stem lubrication.	—	1. Gear Change	(3/93)
	1301-4 (12" Valves)	SMB-2-60	* Deficient	1. Torque switch setting closure time to 50 sec.	1. Reduce the stem factor to 0.15 taking credit for stem lubrication.	yes (9/91)	1. SMB-3-150 2. Gear change/Tech Spec Closure time extension to 50 sec. 3. Cable replacement. 4. Stem replacement.	(3/93)
(Unit 3) HPCI	2301-4 (10" Valves)	SMB-1-60	Non-Deficient	—	1. Reduce the stem factor to 0.15 taking credit for stem lubrication. 2. Limit MOV to 50 cycles.	—	1. SMB-2-25 2. Gear change/tech spec closure time extension to 50 sec. 3. Cable replacement	(3/93)
	2301-5 (10" Valves)	SMB-3-60	Non-Deficient	—	1. Reduce the stem factor to 0.15 taking credit for stem lubrication. 2. Limit MOV to 50 cycles.	—	1. Gear change/Tech spec closure time to 50 sec.	(3/93)

Note #1: All valves are Crane Valves except for the Unit 3 RWCU valves.
Note #2: The following valve factors were used to evaluate the status of the blowdown valves:
Crane Valves = 0.40 valve factor
Anchor/Darling Valves = 0.50 valve factor
* Proposed long-term modifications are subject to change based on future evaluation and/or testing.

ATTACHMENT 2

General NRC Questions

Question 1:

Identify any modifications (e.g. torque switch setting adjustments, gear changes, or motor/actuator replacement) for each MOV within the scope of Supplement 3 to GL 89-10 since June or planned for the future.

Response to Question 1:

A list of the GL 89-10 Supplement 3 valves is provided in Attachment 1. This Attachment includes a revised status of each valve (deficient or non-deficient). The modifications needed to eliminate the deficiencies as well as the modifications planned to enhance design margins are provided with a schedule for each.

Question 2:

Provide current torque switch settings, torque switch bypass, differential pressure, information necessary to confirm motor adequacy, and whether particular valves are flex wedge, split wedge, or parallel disk gate design for each MOV within the scope of Supplement 3.

Response to Question 2:

Attachment 3 provides the pertinent MOV data for determining the type of valve and assessing motor adequacy.

Question 3:

In that you consider the Anchor Darling flex wedge and split wedge gate valves to be unpredictable, how do you plan to size the motor operator and set the torque switches for those valves?

Response to Question 3:

Neither CECo nor the industry believes that the Anchor Darling valves have been proven to be unpredictable. However, the INEL test data indicates that there is a higher level of uncertainty associated with these valves.

Therefore, in an effort to be conservative, CECo has increased the valve factor to 0.5 for determining the minimum thrust requirement for all anchor Darling gate valves used in blowdown applications. In addition, the EPRI test program includes testing of Anchor Darling valves. These test results will be utilized by CECo to provide additional information related to the Anchor Darling valve predictability. If the minimum thrust requirement, using a valve factor of 0.5, is deemed to be inadequate then the following additional conservative actions will be taken for example:

- The Torque switch will be bypassed for approximately 95% of valve travel in the closed direction, to assure that the actuator will provide the maximum available thrust in emergency conditions without tripping prematurely, and/or,
- The valve will be modified or replaced.

Question 4:

In Information Notice 90-72 (November 28, 1990) "Testing of Parallel Disc Gate Valves in Europe," the NRC staff indicates that foreign utilities are using a valve factor of 0.4 for a new German design of the parallel disk gate valve. How do you plan to confirm the sizing of a motor operator and its torque switch settings for a parallel disk design in your valves?

Response to Question 4:

Industry data has shown that parallel disk gate valves have lower valve factors than flex wedge gate valves.

For blowdown valves CECo is currently using a 0.50 valve factor for the sizing of new actuators for Anchor Darling parallel disk gate valves to assure these actuators are conservatively sized. If additional testing is performed, CECo will use these test results to determine appropriate valve factors.

Question 5:

How have you addressed the rate of loading phenomenon in MOV sizing and torque switch settings?

Response to Question 5:

Although the "Rate of Loading" is a recognized phenomenon, industry has not yet quantified its effect. CECo will continue to monitor industry and EPRI activities in this area. Upon completion of the EPRI study, CECo will determine and address the impact of the "Rate of Loading" on the minimum thrust requirements.

Question 6:

Is the torque switch 95% bypass currently installed? Has the leakage rate with an MOV 95% closed been determined? Are the leakage limits of Appendix J or the ASME Code met with the MOV 95% closed?

Response to Question 6:

At LaSalle, containment isolation valves are equipped with a General Electric recommended design future that bypasses the torque switch for approximately 95% of the valve travel in the closing direction. This design feature assures that the actuator will provide maximum available thrust in emergency conditions and will not stop prematurely from a torque switch trip.

This design feature was considered in the evaluation the adequacy of the blowdown valves at Dresden and Quad Cities Station and will be installed on the valves indicated in Attachment 1.

The HELB (High Energy Line Break) isolation valves have two independent safety functions. The first is to close after a LOCA to maintain containment integrity, Primary Containment Isolation System (PCIS), and the second is to close during a HELB to isolate flow into secondary containment. BWRs are not designed for an HELB outside containment, in conjunction with a LOCA.

10 CFR 50, Appendix A, Criterion 50 states in part, "The reactor containment structure, includes access openings, penetrations, and containment heat removal system shall be designed so that the containment structure and its internal compartments can accommodate, without exceeding the design leakage rate and with sufficient margin, the calculated pressure and temperature conditions resulting from any loss-of-coolant accident". 10 CFR 50, Appendix J and the valve seat leakage tests in ASME Section XI outline the valve leakage tests which are required to ensure acceptable valve leakage under LOCA conditions.

During a LOCA, when the containment is pressurized and a source term is created, these valves will not have to close against significant differential pressure or flow (flow and Differential pressure would typically be zero). Under these conditions, the valves will fully close and Primary Containment Isolation System (Appendix J leakage) will be established.

During a HELB outside of containment, a source term is not created and primary containment is not pressurized. Therefore, it is not critical to establish Primary Containment Isolation System (Appendix J Leakage) after a HELB. If the valves were to torque out at 95% closed, the valve port would be covered and flow would be isolated. At 95% closed, the design function of the valve under this accident scenario would be accomplished.

At 95% closed, the disk would be held on the seat by differential pressure similar to a check valve. Since double disk gate valves typically have wide flat seats, there would be stellite to stellite contact completely around the seat. Leakage across the valve with the valve 95% closed would be negligible.

Question 7:
Are MOV re-closure scenarios anticipated? If so, what programs/procedures are in place regarding thermal overload resetting an MOV re-closure?

Response to Question 7:
CECo design basis reviews do not rely on any reclosure scenarios, therefore, no reclosure scenarios are currently anticipated.

Question 8:
Are thermal overload protection devices installed and used?

Response to Question 8:
All safety related MOVs are equipped with thermal overload devices. LaSalle station Primary Containment Isolation System Valves are equipped with a design feature that bypasses the thermal overload devices on an accident signal.

Question 9:
Explain your consideration of degraded voltage.

Response to Question 9:
The starting point for the degraded voltage calculation is the minimum voltage expected at the Motor Control Center (MCC). The Electrical Load Management System (ELMS) file is used to define the minimum expected voltage at the MCC level. ELMS running voltages are based on the minimum expected transmission voltage supplied from the offsite power system and maximum loading conditions at full power with LOCA loads on the distribution system. The minimum expected transmission voltage is considered one of the design bases parameters for the design/evaluation of the auxiliary power systems performance for each station.

For added conservatism and to allow for future distribution system growth, the minimum expected voltages at the MCC level are reduced by one percent.

The voltage at the MOV terminals is determined by calculating the voltage drop between the MCC and the MOV. The voltage drop calculation is based on the MOV's design locked rotor current and includes factors for cable length, cable resistance, cable reactance, elevated Post-accident ambient temperature, raceway correction factor, and thermal overload (TOL) resistance. The TOL resistance is verified to be correct by performing a TOL sizing check.

If the calculated MOV terminal voltage is shown to be inadequate, an alternate resolution will be implemented

LASALLE STATION UNITS 1 & 2								
	RCIC			RWCU				
Parameters / Valve No.	1E51-F008	1E51-F063	1E51-F064	1G33-F001	1G33-F004			
Valve Type	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE			
Closed Torque Switch Bypassed	Yes	Yes	Yes	Yes	Yes			
Valve Size (inches)	4.00	10.00	10.00	6.00	6.00			
Valve Vendor	ANCHOR DARLING	ANCHOR DARLING	ANCHOR DARLING	ANCHOR DARLING	ANCHOR DARLING			
Contact Seat Diameter (inches)	3.6875	8.6560	8.5625	5.3125	5.3125			
Stem Diameter (inches)	1.250	2.000	2.000	1.625	1.625			
Pitch (threads/inch)	1/4	1/3	1/3	1/4	1/4			
Lead (revolutions/inch)	1/4	1/1	1/1	1/4	1/4			
Actuator Model No.	SMB-00-10	SMB-1-25	SMB-1	SMB-00-7.5	SMB-00-7.5			
Overall Unit Ratio	34.10	82.60	82.60	67.50	72.00			
Motor Type	AC	AC	AC	AC	AC			
Motor Speed (rpm)	1800	3600	3600	3600	3600			
Motor Rating (ft-lb)	10	25	25	7.5	7.5			
Motor Rated Voltage (volts)	460	460	460	460	460			
Application Factor	0.9	0.9	0.9	0.9	0.9			
Max. System Pressure in Opening (psig)	1162	1162	1162	1162	1162			
Max. Differential Pressure In Opening (psid)	1162	1162	1162	1162	1162			
Max. System Pressure in Closing (psig)	1162	1162	1162	1162	1162			
Max. Differential Pressure In Closing (psid)	1162	1162	1162	1162	1162			
Motor Terminal Voltage In Opening (volts)	424	395	426	418	421			
Motor Terminal Voltage In Closing (volts)	424	395	426	418	421			

	RCIC			RWCU				
Parameters / Valve No.	2E51-F008	2E51-F063	2E51-F064	2G33-F001	2G33-F004			
Valve Type	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE			
Closed Torque Switch Bypassed	Yes	Yes	Yes	Yes	Yes			
Valve Size (inches)	4.00	10.00	10.00	6.00	6.00			
Valve Vendor	ANCHOR DARLING	ANCHOR DARLING	ANCHOR DARLING	ANCHOR DARLING	ANCHOR DARLING			
Contact Seat Diameter (inches)	3.6875	8.6560	8.5625	5.3125	5.3125			
Stem Diameter (inches)	1.250	2.000	2.000	1.625	1.625			
Pitch (threads/inch)	1/4	1/3	1/3	1/4	1/4			
Lead (revolutions/inch)	1/4	3/3	3/3	1/4	1/4			
Actuator Model No.	SMB-00-10	SMB-1-25	SMB-1-25	SMB-00-7.5	SMB-00-7.5			
Overall Unit Ratio	34.10	82.60	82.60	67.50	72.00			
Motor Type	AC	AC	AC	AC	AC			
Motor Speed (rpm)	1800	3600	3600	3600	3600			
Motor Rating (ft-lb)	10	25	25	7.5	7.5			
Motor Rated Voltage (volts)	460	460	460	460	460			
Application Factor	0.9	0.9	0.9	0.9	0.9			
Max. System Pressure in Opening (psig)	1162	1162	1162	1162	1162			
Max. Differential Pressure In Opening (psid)	1162	1162	1162	1162	1162			
Max. System Pressure in Closing (psig)	1162	1162	1162	1162	1162			
Max. Differential Pressure In Closing (psid)	1162	1162	1162	1162	1162			
Motor Terminal Voltage In Opening (volts)	418	400	418	409	421			
Motor Terminal Voltage In Closing (volts)	418	400	418	409	421			

QUAD CITIES STATION UNITS 1 & 2								
	RWCU		RCIC		HPCI			
Parameters / Valve No.	1-1201-2	1-1201-5	1-1301-16	1-1301-17	1-2301-4	1-2301-5		
Valve Type	FLEX WEDGE GATE	DD GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE		
Closed Torque Switch Bypassed	No	No	No	No	No	No		
Valve Size (inches)	6.00	6.00	3.00	3.00	10.00	10.00		
Valve Vendor	CRANE	ANCHOR DARLING	CRANE	CRANE	CRANE	CRANE		
Contact Seat Diameter (inches)	5.3100	5.2800	2.7500	2.7500	8.7200	8.7200		
Stem Diameter (inches)	1.625	1.500	1.000	1.000	1.875	1.875		
Pitch (threads/inch)	1/4	1/3	1/4	1/4	1/4	1/4		
Lead (revolutions/inch)	1/2	2/3	1/2	1/2	1/2	1/2		
Actuator Model No.	SMB-00-10	SMB-00-15	SMB-000-5	SMB-00-7.5	SMB-1-60	SMB-1-40		
Overall Unit Ratio	72.00	82.00	75.00	77.00	72.42	77.25		
Motor Type	AC	DC	AC	DC	AC	DC		
Motor Speed (rpm)	1800	1900	1800	1900	1800	1900		
Motor Rating (ft-lb)	10	15	5	7.5	60	40		
Motor Rated Voltage (volts)	460	250	208	250	460	250		
Application Factor	0.9	0.9	0.9	0.9	0.9	0.9		
Max. System Pressure in Opening (psig)	1146	1146	1146	1146	1146	1146		
Max. Differential Pressure In Opening (psid)	1146	1146	1146	1146	1146	1146		
Max. System Pressure in Closing (psig)	1146	1146	1146	1146	1146	1146		
Max. Differential Pressure In Closing (psid)	1146	1146	1146	1146	1146	1146		
Motor Terminal Voltage In Opening (volts)	406	168	171	192	371	188		
Motor Terminal Voltage In Closing (volts)	406	168	171	192	371	188		

	RWCU		RCIC		HPCI			
Parameters / Valve No.	2-1201-2	2-1201-5	2-1301-16	2-1301-17	2-2301-4	2-2301-5		
Valve Type	FLEX WEDGE GATE	DD GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE		
Closed Torque Switch Bypassed	No	No	No	No	No	No		
Valve Size (inches)	6.00	6.00	3.00	3.00	10.00	10.00		
Valve Vendor	CRANE	ANCHOR DARLING	CRANE	CRANE	CRANE	CRANE		
Contact Seat Diameter (inches)	5.3100	5.2800	2.7500	2.7500	8.7200	8.7200		
Stem Diameter (inches)	1.625	1.500	1.000	1.000	1.875	1.875		
Pitch (threads/inch)	1/4	1/3	1/4	1/4	1/4	1/4		
Lead (revolutions/inch)	1/2	2/3	1/2	1/2	1/2	1/2		
Actuator Model No.	SMB-00-10	SMB-00-15	SMB-000-5	SMB-00-7.5	SMB-1-60	SMB-1-40		
Overall Unit Ratio	72.00	77.00	75.00	77.00	72.42	77.30		
Motor Type	AC	DC	AC	DC	AC	DC		
Motor Speed (rpm)	1800	1900	1800	1900	1800	1900		
Motor Rating (ft-lb)	10	15	5	7.5	60	40		
Motor Rated Voltage (volts)	460	250	208	250	460	250		
Application Factor	0.9	0.9	0.9	0.9	0.9	0.9		
Max. System Pressure in Opening (psig)	1146	1146	1146	1146	1146	1146		
Max. Differential Pressure In Opening (psid)	1146	1146	1146	1146	1146	1146		
Max. System Pressure in Closing (psig)	1146	1146	1146	1146	1146	1146		
Max. Differential Pressure In Closing (psid)	1146	1146	1146	1146	1146	1146		
Motor Terminal Voltage In Opening (volts)	418	149	178	190	398	194		
Motor Terminal Voltage In Closing (volts)	418	149	178	190	398	194		

DRESDEN STATION UNITS 2 & 3								
	RWCU		RCIC				HPCI	
Parameters / Valve No.	2-1201-1	2-1201-2	2-1301-1	2-1301-2	2-1301-3	2-1301-4	2-2301-4	2-2301-5
Valve Type	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE
Closed Torque Switch Bypassed	No	No	Yes	No	No	Yes	No	No
Valve Size (inches)	8.00	8.00	14.00	14.00	12.00	12.00	10.00	10.00
Valve Vendor	CRANE	CRANE	CRANE	CRANE	CRANE	CRANE	CRANE	CRANE
Contact Seat Diameter (inches)	7.0000	7.0000	11.2500	11.2500	10.3400	10.3400	8.7200	8.7200
Stem Diameter (inches)	1.875	1.875	2.375	2.375	2.125	2.125	1.875	1.875
Pitch (threads/inch)	1/4	1/4	1/3	1/3	1/3	1/3	1/4	1/4
Lead (revolutions/inch)	1/2	1/2	3/3	3/3	3/3	3/3	1/2	1/2
Actuator Model No.	SMB-0-40	SMB-1-60	SMB-2-60	SMB-3-80	SMB-2-80	SMB-2-60	SMB-1-60	SMB-3-60
Overall Unit Ratio	39.10	42.50	59.40	66.00	67.40	63.00	60.20	34.60
Motor Type	AC	DC	AC	DC	DC	AC	AC	DC
Motor Speed (rpm)	1800	1900	1800	1900	1900	1800	3600	1900
Motor Rating (ft-lb)	40	60	60	80	80	60	60	60
Motor Rated Voltage (volts)	460	250	440	250	250	460	460	250
Application Factor	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Max. System Pressure in Opening (psig)	1146	1146	1146	1146	1146	1146	1146	1146
Max. Differential Pressure In Opening (psid)	1146	1146	1146	1146	1146	1146	1146	1146
Max. System Pressure in Closing (psig)	1146	1146	1146	1146	1146	1146	1146	1146
Max. Differential Pressure In Closing (psid)	1146	1146	1146	1146	1146	1146	1146	1146
Motor Terminal Voltage In Opening (volts)	350	189	356	183	198	384	333	186
Motor Terminal Voltage In Closing (volts)	350	189	356	183	198	384	333	186

	RWCU		RCIC				HPCI	
Parameters / Valve No.	3-1201-1	3-1201-2	3-1301-1	3-1301-2	3-1301-3	3-1301-4	3-2301-4	3-2301-5
Valve Type	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE	FLEX WEDGE GATE
Closed Torque Switch Bypassed	No	No	Yes	No	No	Yes	No	No
Valve Size (inches)	8.00	8.00	14.00	14.00	12.00	12.00	10.00	10.00
Valve Vendor	ANCHOR DARLING	ANCHOR DARLING	CRANE	CRANE	CRANE	CRANE	CRANE	CRANE
Contact Seat Diameter (inches)	6.9320	6.9320	11.2500	11.2500	10.3400	10.3400	8.7200	8.7200
Stem Diameter (inches)	1.750	1.750	2.375	2.375	2.125	2.125	1.875	1.875
Pitch (threads/inch)	1/4	1/4	1/3	1/3	1/3	1/3	1/4	1/4
Lead (revolutions/inch)	1/2	1/2	1/1	3/3	3/3	3/3	1/2	1/2
Actuator Model No.	SMB-0-40	SMB-1-60	SMB-2-60	SMB-3-80	SMB-2-80	SMB-2-60	SMB-1-60	SMB-3-60
Overall Unit Ratio	39.10	42.50	59.40	66.01	67.42	63.26	60.20	34.60
Motor Type	AC	DC	AC	DC	DC	AC	AC	DC
Motor Speed (rpm)	1700	1900	1800	1900	1900	1800	3600	1900
Motor Rating (ft-lb)	40	60	60	80	80	60	60	60
Motor Rated Voltage (volts)	440	250	440	250	250	460	460	250
Application Factor	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Max. System Pressure in Opening (psig)	1146	1146	1146	1146	1146	1146	1146	1146
Max. Differential Pressure In Opening (psid)	1146	1146	1146	1146	1146	1146	1146	1146
Max. System Pressure in Closing (psig)	1146	1146	1146	1146	1146	1146	1146	1146
Max. Differential Pressure In Closing (psid)	1146	1146	1146	1146	1146	1146	1146	1146
Motor Terminal Voltage In Opening (volts)	391	185	388	198	183	401	322	186
Motor Terminal Voltage In Closing (volts)	391	185	388	198	183	401	322	186