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August 26, 1991
NRC-91-0117

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) NRC Generic Letter 89-10, Supplement 3, "Consideration of the Results of NRC-Sponsored Tests of Motor-Operated Valves," dated October 25, 1990

3) Detroit Edison Letter to NRC, "Response to NRC Generic Letter 89-10, Supplement 3," NRC-90-0180, dated December 10, 1990

4) Detroit Edison Letter to NRC, "Additional Response to NRC Generic Letter 89-10, Supplement 3," NRC-91-0036, dated March 8, 1991

5) NRC Letter to Detroit Edison, "Request for Additional Information Re: Generic Letter (GL) 89-10, Supplement 3: Consideration of the Results of NRC-Sponsored Tests of Motor-Operated Valves (TAC No. 77775)," dated July 26, 1991

Subject: Submittal of NRC Requested Additional Information Regarding Generic Letter 89-10, Supplement 3

By References 3 and 4 Detroit Edison submitted its responses to Supplement 3 of Generic Letter 89-10 (Reference 2). Subsequently, Detroit Edison received a Request for Additional Information (RAI) regarding Generic Letter 89-10, Supplement 3 (Reference 5). This RAI was received on July 26, 1991 and requested a response within 30 days from receipt of the NRC letter. This letter provides the requested response to the NRC letter.

The enclosure provides Detroit Edison's response to each specific item of the RAI and contains additional information regarding Generic Letter 89-10, Supplement 3, as requested.

If you have any question, please contact Mr. Girija S. Shukla at (341) 586-4270.

Sincerely,

S Katola

cc: A. B. Davis
R. W. DeFayette
J. F. Stang
S. Stasek

Response to NRC Request for Additional Information Regarding Supplement 3 to Generic Letter 89-10

The Detroit Edison response to each item in the NRC Request for Additional Information (RAI) is given below:

o **NRC RAI Item No. 1:**

Identify any modifications (e.g., torque switch setting adjustments, gearing changes, or motor/actuator replacement) for each MOV within the scope of Supplement 3 to GL 89-10 since June 1990 or planned for the future.

Detroit Edison Response:

Maintenance records since June 1990 for MOVs (E4150F002, E4150F003, E5150F007, E5150F008, G3352F001, and G3352F004) within the scope of Supplement 3 to GL 89-10 were reviewed for any performed or planned modification. {The HPCI MOV E4150F600 discussed in our response to Supplement 3 (Reference 4) is a globe valve and is outside the scope of Supplement 3.} The results of this review for each above MOV are as follows:

HPCI MOV E4150F002: During the second refueling outage (April through June 1991), this valve was repacked, the operator was removed and reinstalled, and the valve seat was lapped because the valve had failed its Local Leak Rate Testing (LLRT). After rework, the valve was statically MOVATS tested and a satisfactory LLRT was performed. The Torque Switch Setting (TSS) was raised from 2.75 to 3.5 and from 2.5 to 3.0 in the close and open directions respectively. The MOVATS thrust at the Control Switch Trip (CST) was 32,083 lbs., which is still higher than that of 29,000 lbs. for Wm. Powell valve per INEL blow-down testing results. No other modification is planned for the future based on the existing design requirements.

HPCI MOV E4150F003: During the second refueling outage, this valve was repacked and TSS was raised from 1.5 to 1.75 to bring the TSS within design recommended values. The MOVATS test performed in October 1989 indicated a CST thrust at the TSS of 1.5 was 61,000 lbs. and the thrust with an increased TSS will be higher than 61,000, which is already more than twice the 29,000 lbs. for Wm. Powell valve per INEL blow-down test results. Therefore, no thrust verification was performed. However, since the motor seating current at CST (TSS = 1.75) measured by visicorder was high, Detroit Edison plans to lower the TSS from 1.75 to 1.5 and perform thrust verification during the next

refueling outage which is scheduled in the third quarter of 1992. The valve operability is justified in Table B under RAI item no. 3.

RCIC MOV E5150F007: During the second refueling outage, the actuator was disassembled because the valve failed Post Maintenance Testing (PMT) stroke test. Minor corrective maintenance was performed on the declutch and the actuator was reinstalled. The VOTES diagnostic static test was performed, and the CST thrust at TSS of 1.5 was found to be 8,794 lbs. The TSS was not adjusted. No other modification is planned for the future based on the existing design requirements.

RCIC MOV E5150F008: No modification (e.g., torque switch setting adjustments, gearing changes, or motor/actuator replacement) has been done since June 1990 and none is planned for the future based on the existing design requirements.

RWCU MOV G3352F001 - No modification (e.g., torque switch setting adjustments, gearing changes, or motor/actuator replacement) has been done since June 1990 and none is planned for the near future based on the existing design requirements.

RWCU MOV G3352F004: As committed in Detroit Edison response to Supplement 3, this MOV was statically tested for thrust verification during the second refueling outage. The as-left CST thrust was 22,705 lbs., which is much higher than the calculated closing design thrust of 11,182 lbs. at a disk factor of 0.3 and 15,647 lbs. at a disk factor of 0.5. However, it was observed during testing that a significant amount of cyclic loading was present, which corresponded to a possible drive sleeve problem. The test results also indicated that there was some disc-to-disc guide excessive friction. Therefore, this MOV is being considered for internal inspection of the valve as well as actuator during the third refueling outage which is scheduled in the third quarter of 1992. The valve operability is justified based on the test results and the thrust value as discussed above.

All the above MOVs will be evaluated for the increased reactor pressure associated with Detroit Edison's power uprate program. Modification, if necessary to account for the increased Maximum Expected Differential Pressure (MEDP) and thrust requirements, will be implemented prior to operating the plant at an uprated power level.

o **NRC RAI Item No. 2:**

Identify the particular valves that are flex wedge, split wedge, or parallel disk gate design.

Detroit Edison Response:

The MOVs E4150F002, F4150F003, E5150F007, E5150F008, G3352F001, and G3352F004 are flex wedge gate design. This information was confirmed with Wm. Powell, the valve vendor who supplied these valves to Detroit Edison.

o **NRC RAI Item No. 3:**

Provide information necessary to confirm motor adequacy for each MOV within the scope of Supplement 3.

Detroit Edison Response:

The following two tables provide the information necessary to confirm motor adequacy for each MOV within the scope of Supplement 3. Table A describes the as-left torque switch setting in the field and the corresponding calculated stem torque required to trip the motor. Table A also provides the available calculated stem torque that each motor is capable of delivering at the degraded voltage. Hence, it is concluded from the motor adequacy column that the available torque at degraded voltage is higher than that required to close the valve. In addition, the detailed motor design parameters, minimum start current, and seating current during testing are provided in Table B to demonstrate motor adequacy.

TABLE A

MOV	As Left TSS (Close)	Corresp. Stem Torque ft-lbs (a)	Available Stem Torque (ft-lbs) at Degraded Voltage (b)	Motor Adequacy b > a	Motor Start Torque (ft-lbs)
E4150F002	3.5	750	841	Yes	60
E4150F003	1.75	701	858	Yes	100
E5150F007	1.5	50	131	Yes	7.5
E5150F008	1.0	110	129	Yes	10
G3352F001	1.0	82	223	Yes	25
G3352F004	2.25	218	352	Yes	40

TABLE B

Valve PIS #	Rated Voltage	FLA (AMPS)	LRA (AMPS)	Minimum Voltage	% Rated Voltage	Cable Max Ambient Temp.	Motor Max Ambient Temp.	Mini. Start Current (AMPS)(1) (3)	Seating Current During Testing (AMPS)(2) (3)
E4150F002	460VAC	11.4	94.3	434	94.4	65°C	40°C	45.6	30
E4150F003	250VDC	32	184	191	76.4	100°C	100°C	108.9	122
E5150F007	460VAC	2.3	12	459	99.7	65°C	40°C	12	4.0
E5150F008	250VDC	3.4	19	204	81.6	100°C	100°C	12	8.26
G3352F001	460VAC	4	25.5	436	94.6	65°C	40°C	15	8.27
G3352F004	250VDC	12	51	197	78.8	62°C	62°C	35.2	28.6

Notes:

(1) The minimum start current for AC motors is the current upon which the voltage drop calculation is based. For DC motors, it is the minimum amount of current that the motor is capable of producing at degraded voltage.

(2) Seating current measured during testing at as-left TSS.

(3) All valves, except E4150F003, will produce the current required at their maximum allowable torque switch setting. Since the primary safety function of the HPCI MOV E4150F003 is to open to allow steam inlet, unseating of the valve is the main concern. Test results have indicated that the required unseating current is only 71.2 amps where as 108.9 amps are available. Hence, the valve will perform its opening function. In case the automatic isolation safety function is required, the battery profile demonstrates that sufficient current is available to assure closure of the valve within the first minute of the postulated accident.

- **NRC RAI Item No. 4:**

  Explain the "10-2" percent closure of a valve. Are the leakage rates within the limits of Appendix J and the ASME Code at this percent closure?

  Detroit Edison Response:

  The "10-2" percent closure of a valve means that, during closing stroke, the torque switch is bypassed until the is between 10 percent and 2 percent open (at the end closing stroke). At this point, the torque switch . motor control circuit, and the closing stroke of the ve continues until the torque switch trips the motor. Such control logic for the MOV allows maximum motor torque availability to be delivered to the valve if needed, thus providing a greater reliability for valve closure. Therefore, the torque switch control logic for "10-2" percent closure has no bearing on the valve's ability to fully close and, thus, has no effect on the valve's ability to successfully pass its Appendix J and the ASME code testing. In case, the valve does not fully close and remains between 10 percent and 2 percent open, it is unlikely that the valve could satisfy its Appendix J and the ASME Code Local Leak Rate Test acceptance criteria. However, the point at which the torque switch comes into the circuit would have no effect on the valve's ability to fully close if the torque switch performs its design function.

- **NRC RAI Item No. 5:**

  What is the schedule for the testing of the RWCU MOV? The staff's safety assessment discussed in Supplement 3 to GL 89-10 supports continued operation for 18 months or the first refueling outage. If the RWCU test schedule is beyond those dates, provide the safety assessment to justify continued operation beyond the recommended schedule.

Detroit Edison Response:

RWCU MOV, G3352F004, described in the response to GL 89-10 Supplement 3 was tested during the second refueling outage. Based on the test results and as-left closing thrust, the MOV is considered operable to perform its design safety function.

o NRC RAI Item No. 6:

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

Detroit Edison Response:

Detroit Edison is still awaiting EPRI and industry guidelines for considering the rate of loading phenomenon in MOV sizing and torque switch setting. The results of dynamic testing of eight MOVs at Detroit Edison during the second refueling outage provided a preliminary indication that the rate of loading could vary from -6 to +25 percent for CST thrust. Therefore, Detroit Edison is awaiting industry guidelines rather than assuming a random factor to account for the rate of loading.