

Detroit Edison



December 22, 1999
NRC-99-0104

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

- References:
- 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43
 - 2) NRC Generic Letter 96-05,
"Periodic Verification Of Design-Basis Capability
Of Safety-Related Motor-Operated Valves,"
dated September 18, 1996
 - 3) Detroit Edison letter to NRC, "Detroit Edison
180-Day Response to NRC Generic Letter (GL) 96-05,"
NRC-97-0020, dated March 18, 1997
 - 4) Detroit Edison letter to NRC, "Detroit Edison
Participation in the Joint Owners' Group (JOG)
Program for Periodic Verification of Motor-Operated
Valves (MOV's)," NRC-98-0091, dated June 17, 1998
 - 5) NRC letter to Detroit Edison, "Request for
Additional Information Related to the Fermi-2
Response to Generic Letter 96-05, "Periodic
Verification of Design-Basis Capability of Safety-Related
Motor-Operated Valves," dated February 22, 1999
 - 6) Detroit Edison letter to NRC, "Response to NRC
Generic Letter (GL) 96-05 Request for Additional
Information," dated April 23, 1999

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Subject: Clarifications to Detroit Edison's Response to Generic
Letter 96-05 Regarding the Fermi 2 MOV Periodic
Verification Program (TAC No. M97047)

In Reference 2, the NRC requested holders of nuclear power reactor operating licenses to establish a program to periodically verify that safety-related Motor-Operated Valves (MOVs) continue to be capable of performing their safety functions within the current licensing bases of the facility. Reference 3 described Detroit Edison's Motor-Operated Valve Periodic Verification Program (PVP) for Fermi 2. Reference 4 provided information regarding Detroit Edison's participation in the Joint Owners' Group (JOG) program. In Reference 5, the NRC requested additional information regarding the Fermi 2 PVP, and Reference 6 provided Detroit Edison's response to the requested additional information.

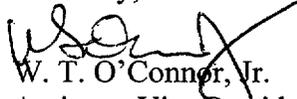
Following recent internal evaluations and discussions and the conference call with NRC representatives on November 4, 1999, Detroit Edison has decided to fully comply with all three phases of the JOG MOV Periodic Verification Program. The enclosure to this letter provides appropriate clarifications to items discussed in References 3, 4 and 6.

The following commitment is made in this letter:

Fermi 2 will comply with all three phases of the JOG Motor Operated Valves Periodic Verification Program. The first phase of interim static diagnostic testing will be fully implemented within 60 days after the completion of the seventh refueling outage (RFO7).

Should you have any questions or require additional information, please contact Mr. Norman K. Peterson of my staff at (734) 586-4258.

Sincerely,


W. T. O'Connor, Jr.
Assistant Vice President
Nuclear Assessment

Enclosure

cc: A. J. Kugler
A. Vogel
NRC Resident Office
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

**CLARIFICATIONS TO DETROIT EDISON'S RESPONSE TO GL 96-05
REGARDING THE FERMI 2 MOV PERIODIC VERIFICATION PROGRAM**

Detroit Edison will fully comply with all three phases of the Joint Owners Group (JOG) program on periodic verification of motor operated valves as described in Revision 2 of Boiling Water Reactor Owners' Group (BWROG) Topical Report Number NEDC-32719, "BWROG Program on MOV Periodic Verification," dated July 1997, and as reviewed in the associated NRC Safety Evaluation, dated October 30, 1997. Significant clarifications to previous communications on this issue are provided below.

- 1) In Reference 3, Detroit Edison stated that MOV periodic verification at Fermi 2 would be performed per the JOG Periodic Verification Program with one exception. This exception was that Fermi 2 would use a plant-specific process to determine required testing frequencies instead of using the test frequency matrix in the JOG Interim Periodic Test Program. This exception will now be phased out such that MOV test frequencies will be determined in the manner prescribed by the JOG Interim Periodic Test Program (IPTP). The phase out, including procedure updates, will be fully completed within 60 days after the completion of the upcoming seventh refueling outage (RFO7) scheduled to start on March 31, 2000. MOV Periodic Verification testing scheduled for RFO7 has already been determined based on Fermi 2 plant-specific process; however, using the JOG approach to determine the RFO7 test scope results in no MOVs that are overdue for testing.
- 2) In Reference 6, Detroit Edison reserved full commitment to the JOG long term Periodic Test Program pending the completion of the program development and evaluation of the final outcome. This reservation was based on the fact that Fermi 2 Interim Periodic Test Program deviated from the JOG IPTP and it was likely that similar exceptions would apply to the long term test program once it is developed. Since Detroit Edison is now fully committed to the JOG IPTP, full commitment is also extended to the JOG long term Periodic Test Program with no reservation.

Detroit Edison has reviewed the NRC Safety Evaluation on the JOG MOV Periodic Verification Program, as described in Topical Report NEDC-32719. Section 5 of this Safety Evaluation includes a list of the more significant conditions and limitations for NRC staff acceptance of the JOG approach. The following describes Detroit Edison's plans to address these conditions and limitations in the Fermi 2 MOV Periodic Verification Program.

- A) *JOG must submit for NRC review and approval a revision to (or replacement report for) the topical report following the JOG dynamic test program which describes the final test criteria for the long-term MOV Periodic Verification Program, and the justification for those criteria.*

No plant specific action is required by this condition. The action will be addressed by the Joint Owners' Group.

- B) *Licensees that did not participate in the development of NEDC-32264 must justify their MOV risk categorization methodology as part of their implementation of the JOG program.*

The NRC staff is reviewing an MOV risk ranking methodology submitted by WOG for possible endorsement.

The MOV Risk Prioritization effort at Detroit Edison was completed in August 1996, prior to the release of NEDC-32264. In its simplest form, the Detroit Edison effort involved a quantitative evaluation using the plant-specific Probabilistic Safety Assessment (PSA) followed by a qualitative assessment using an Expert Panel to categorize each MOV in one of three risk categories. The overall effort included component level evaluation as well as multiple Functional Failure Modes (FFMs). All GL 96-05 MOVs were considered in this effort which included the evaluation of over 200 FFMs.

The PSA phase of the effort quantified the Risk Achievement Worth (RAW) for each of the MOVs modeled in the Fermi 2 risk assessment tools. PSA capabilities to evaluate component-level importance were improved over the IPE tools to support the MOV risk ranking. The valves were initially placed into four categories of risk importance: High, Medium, Low, and Low-Low. The Low-Low category was the grouping of valves where, with a failure probability of 1.0, the group's cumulative RAW value did not exceed 2.0. This approach conservatively accommodates the unlikely scenario that all Low-Low valves would be guaranteed to simultaneously fail. For simplicity and consistency with the industry, all of the valves classified as Low-Low were later placed into the Low category. The high category valves were those whose individual guaranteed failure increased Core Damage Frequency by a factor of two (RAW = 2.0) or more. For the MOV failure probabilities used in the PSA, this criterion is more conservative than that used in NEDC-32264 for high rank valves

The Expert Panel Review phase initially placed all valves not modeled in the PSA into each of the three PSA Priority bins using a purely judgmental consideration of their accident mitigation worth. In a separate exercise each of the GL 96-05 MOVs was assessed in detail. The FFMs modeled in the PSA were evaluated, along with aspects of the valve location and history of reliability. In addition, the Expert Panel considered issues and accident precursors not explicitly modeled in the PSA including: external flooding, internal fires, safe shutdown capability with coincident Loss Of Offsite Power and Loss Of Coolant Accident (LOOP/LOCA), spent fuel pool cooling, and shutdown operations. The final product of the Expert Panel phase was to accept or upgrade the PSA-based risk importance classifications. About 15% of the PSA-modeled valves were assigned a higher risk ranking and no valves were assigned a lower risk ranking as a result of the Expert Panel review effort.

The PSA model was enhanced and revised in 1997. The significant changes were incorporation of fault tree logic and model updates due to plant design changes. Results of component level analysis with the new model were used to update the MOV risk prioritization.

While the MOV Risk Prioritization effort was completed prior to the release of NEDC-32264, the methodologies are very similar. The basic process of review of quantitative results and the performance of qualitative risk assessment by the Expert Panel are the same. Also, Detroit Edison has already revised MOV Risk Prioritization based on updates to the

plant PSA model. As a result, there is a high level of confidence that every MOV within the scope of GL 96-05 has been assigned risk ranking based on an accurate, conservative, and up to date process equivalent to that contained in NEDC-32264.

- C) *Licensees implementing the JOG program must address the NRC evaluation and conclusions on the JOG program provided in this SE (and in the supplement to be prepared after the results of the JOG dynamic test program are evaluated). JOG indicated that participating licensees will be requested, following issuance of this SE, to individually notify the NRC of their plans to implement the JOG program described in Revision 2 of the topical report. Participating licensees must justify any deviations from the JOG program.*

The primary purpose of this letter is to provide the NRC with information regarding how Detroit Edison is addressing the NRC evaluation and conclusions on the JOG program as provided in the NRC Safety Evaluation. As stated above, Detroit Edison will implement the three phases of the JOG program with no exceptions.

- D) *Licensees implementing the JOG program must determine any valves that are outside the scope of applicability of the JOG overall program or the JOG dynamic test program (or deleted from the JOG program scope), such as in terms of valve manufacturer, size, type, materials, or service conditions, and must justify a separate program for MOV periodic verification for those valves, materials, and service conditions not encompassed by the JOG program.*

Detroit Edison is currently evaluating the impact of JOG Feedback Notification FN-02 in order to identify any valves without adequate coverage under the JOG Dynamic Testing Program. A separate program to assess potential aging or service related degradation of these valves is being pursued.

- E) *Licensees implementing the JOG program must address the information provided as a result of the JOG program during and following the JOG dynamic test program. This responsibility includes notification of the NRC under 10 CFR Part 21, evaluation of experience and applicability, and consideration of effects on component operability, as appropriate.*

Detroit Edison will fully comply with this requirement, and to properly address both the programmatic and operability impacts of such notifications. As stated above, Detroit Edison is currently evaluating the impact of JOG's Feedback Notification FN-02 on the Fermi 2 MOV Periodic Verification Program.

- F) *Licensees must ensure that each MOV in the JOG program will have adequate margin (including consideration for aging-related degradation) to remain operable until the next scheduled test, regardless of its risk categorization or safety significance.*

Detroit Edison is in full compliance with this requirement. All MOVs in the GL 96-05 scope are evaluated carefully at the time of a thrust verification test and in response to applicable industry information to ensure continued operability is not challenged.

- G) *Licensees may retain their approach for MOV setup where it is justified that MOVs are properly evaluated for operability. However, when establishing test frequencies under the JOG program, licensees must apply uncertainties as appropriate in calculating actuator output or valve required thrust (or torque).*

Detroit Edison is in full compliance with this requirement. Calculations of both motor and valve margins are performed in a manner consistent with accepted industry practice and in accordance with the NRC Safety Evaluation on the JOG Periodic Verification Program.

The following factors are quantified on a valve-specific basis and properly applied as conservative adjustments to measured actuator output thrust:

ACC	Instrument Accuracy factor
TSR	Torque Switch Repeatability factor
ROL	Rate Of Loading factor
SPR	Spring Pack Relaxation factor
SLD	Stem Lubricant Degradation factor
VCL	Valve Condition Load (i.e. Parasitic Load) as determined from valve-specific static test data

- H) *With the focus of the JOG program on the potential age-related increase in the thrust and torque required to operate the valves, licensees must address apart from the JOG program the thrust and torque delivered by the motor operator. Licensees must address the effects of aging on rate-of-loading and stem friction coefficient under dynamic conditions, and other potential age-related effects such as spring-pack relaxation, and actuator and switch lubrication degradation.*

Where industry guidance exists, Detroit Edison has programmatically addressed these issues and embedded appropriate factors into the margin calculations. Additionally, Detroit Edison maintains a close contact with MOV industry groups and will address any new information on these issues as it is developed. Separate from the JOG IPTP, Detroit Edison has comprehensive preventive and predictive maintenance coverage of MOVs. In addition, the performance and reliability of MOVs at Fermi 2 is trended. Actions are taken on both a programmatic and valve-specific basis where appropriate. Regardless of the Periodic Verification test frequencies, each MOV in the GL 96-05 scope is currently monitored using the Motor Power Monitor diagnostic system every 18-36 months in conjunction with the preventive maintenance program. These tests are evaluated for any indications of degradation, using both quantitative and qualitative trending techniques. There have been several examples where corrective actions were initiated as a result of a condition that could have ultimately led to a performance problem. There have also been examples where testing was done on an increased frequency to allow clarification of a potential trend. Another potential outcome of this predictive testing is the determination of need for more intrusive, at-valve testing when appropriate.

- I) *The dynamic test sequence in the JOG program includes a static test preceding the dynamic test. JOG will evaluate available test information, to the extent possible, to*

determine whether the performance of a static test immediately preceding a dynamic test might affect the conclusions of the program. The NRC staff will continue to monitor this issue on the basis of JOG data and NRC research results.

Detroit Edison will perform the dynamic testing as prescribed in approved JOG test procedures.

- J) *MOV's with scheduled test frequencies beyond 5 years will need to be grouped with other MOV's that will be tested on frequencies less than 5 years in order to validate assumptions for the longer test intervals. This review must include both valve thrust (or torque) requirements and actuator output capability.*

Based on the current test frequency matrix, a representative sample of GL 96-05 MOVs is being tested at frequencies less than 5 years. Results obtained from periodic verification testing will be used to validate the established test frequencies for all MOVs in the program on a periodic basis. As discussed in reference 6, Detroit Edison has noted no evidence of time-dependant actuator output degradation that is generic in nature, other than the potential for lubrication degradation. All GL 96-05 MOVs contain the same lubricants and are maintained under similar guidelines.