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Nuclear Operations

May 14, 1993
NRC-93-0052

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

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

2) NRC Inspection Report No. 50-341/93003
dated March 30, 1993

Subject: Reply to Non-Cited Violation dated March 30, 1993

Enclosed is Detroit Edison's response to a non-cited violation contained in Reference 2. This violation was for failure to promptly evaluate results from MOV dynamic testing performed as part of Fermi 2's commitment to Generic Letter 89-10.

This was a self-identified violation by Detroit Edison. Therefore, the violation was not subject to enforcement action because of Detroit Edison's effort in identifying and developing a plan to correct the violation.

If you have any questions regarding this response, please contact Elizabeth A. Hare, Senior Compliance Engineer at (313) 586-1427.

Sincerely,

Enclosure
Attachment: Procedure 47.306.02
MOV Program Guideline Attachment 11

cc: T. G. Colburn
A. B. Davis
W. J. Kropp
M. P. Phillips
Region III

IE01
1/1

Reply to Non-Cited Violation 50-341/93003 dated March 30, 1993

Statement of Non-Cited Violation:

10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires licensees to evaluate the results of tests to assure that test requirements have been satisfied. Failure to promptly evaluate results from MOV dynamic testing performed as part of its commitment to Generic Letter 89-10 is considered a violation of Criterion XI. However, the NRC wants to encourage and support licensee's initiatives for self-identification and correction of the problems. Therefore, this violation is not being cited because the criteria specified in Section VII.B.2 of the "General Statement of Policy and Procedures for NRC Enforcement Action," (Enforcement Policy, 10 CFR Part 2, Appendix C) were satisfied. Specifically, the licensee identified that thorough test result evaluations were not completed at the time of the dp tests and subsequently developed a "MOV Post-testing Review" evaluation form to review the results. The licensee committed to complete an evaluation form for the 21 previously performed dp tests by May 14, 1993, and to include consideration of motor capability. In addition, plant procedures were revised to require prompt evaluation following future dp tests.

Include in your response: (1) the revised acceptance criteria for MOV tests, including consideration of actuator motor capability, and (2) the results of the reevaluation of the MOV tests evaluated using the previous unacceptable criteria.

Detroit Edison Response:

(1) **Revised Acceptance Criteria for MOV Tests**

As committed during the Phase II Inspection, Detroit Edison will use thrust reduction margin for the rate of loading, stem lube degradation and torque switch repeatability effects along with the diagnostic equipment accuracy. The revised thrust acceptance criteria being used during the static as well as dynamic test evaluation process is already included as Attachment 4 to procedure 47.306.02 "VOTES System Operating Procedure" (see attachments). A copy of the revised procedure 47.306.02 was sent to NRC Region III the last week of February 1993. MOV Program Guideline Attachment 11 (see attachments) was revised to account for reduction in the thrust margin due to above mentioned effects per the industry adopted methodology. This revised thrust acceptance criteria was used for evaluation of dynamic test results. Procedure 47.306.02 Attachment 4 will be further revised prior to the next MOV test to better coordinate with the revisions to the MOV Program Guideline Attachment 11. Procedure 47.306.02 requires completion of the evaluation of dynamic and static test results prior

to processing the work package through the Nuclear Shift Supervisor for returning the MOV to service.

Detroit Edison is considering the use of a statistical standard deviations approach in combining the thrust reduction effects due to rate of loading and stem lube degradation. Until plant specific parameters for rate of loading and stem lube degradation can be established by additional dp testing, industry provided data will be utilized. Therefore, Attachment 4 to Procedure 47.306.02 may be revised if the statistical approach is acceptable based on further dynamic testing performed at Fermi 2.

Detroit Edison presently evaluates the actuator motor capability during the diagnostic testing based on 60% locked rotor seating current (LRA) for safety related MOVs except a for few MOVs where the seating current criteria is lower than 60% LRA. This criteria is included in the procedure 47.306.02, "VOTES System Operating Procedure". In response to the NRC Inspector's concern for unseating motor current during the opening stroke for gate valves, procedure 47.306.02 was revised to include the 60% LRA for maximum unseating motor current. During the design basis review, the actuator motor capability at degraded voltage is evaluated per the Limitorque SEL methodology which verifies the motor torque output meets the design required torque and provides the maximum allowable torque switch setting based on the spring pack curve. However, due to variation in the spring pack stiffness and stem factor, the motor capability during the diagnostic testing could not accurately be predicted by torque switch setting and measured thrust. Therefore, Detroit Edison feels confident that the motor capability evaluation based on its operating parameter (i.e., motor current) during the diagnostic testing is a more accurate performance indicator.

(2) Results of Re-evaluation of the MOV Tests

Based on the revised acceptance criteria for MOV tests described above, as committed during the Phase II Inspection, Detroit Edison evaluated the dynamic test results of 21 MOVs. The evaluation included the review of the differential pressure acting on the MOV and the calculation of rate of loading and valve factor for those cases during which acceptable differential pressure (dp) compared to the design basis dp was available during testing. The summary of evaluation is as follows:

The differential pressure (dp) achieved during the dynamic testing for 9 MOVs was between 77 and 100% of the design dp. The valve factors and rate of loading results obtained from the evaluation were considered along with the stem lube degradation, torque switch repeatability and equipment accuracy for predicting thrust margin as well as MOV capability at the design basis differential pressure. The rate of loading effects varied from 1% to 32%. The valve factors at flow cut off for globe valves were lower than those used in the design

basis review and for gate valves were higher than those used in the design basis review. However, these MOVs are considered operable based on the available and required thrust at the revised valve factors based on the dynamic testing. As part of the MOV evaluation process, Deviation Event Reports (DER) were issued due to marginally meeting the acceptance test criteria or exceeding the presently available maximum structural strength limits for valves and actuators. Based on MOV operating history and the range of over thrust, these valves are considered acceptable. Issuance of the DERs will ensure further evaluation and follow-up corrective action are performed in a timely manner.

Five MOVs did not experience adequate differential pressure during the dynamic testing due to inadequate system lineup configuration. The inadequate differential pressure was due to the pressure effects from interconnected piping not properly isolated from the test loop. Four of these MOVs are minimum flow MOVs for pumps and need to be retested such that there is no pressure effect on the downstream side due to flow in other connected piping system. These MOVs will be scheduled for re-testing during or prior to the fourth refueling outage scheduled to start in March 1994. The dynamic test results (VOTES thrust signature) for one more MOV could not be evaluated due to a high calibration error for extrapolation. The design basis differential pressure for this MOV is only 15 psid and therefore the MOV will not be retested under dynamic conditions. These MOVs have been tested in the static condition and do have adequate thrust margin for performing their safety functions. This conclusion is based on the static test results of an additional 59 MOVs tested at Fermi 2.

Six MOVs in Residual Heat Removal (RHR) service water system were tested under normal service water system operating configuration. These MOVs are located at the discharge end of the system. Due to substantial pressure drop throughout the system, differential pressure experienced by these MOVs was around 6 psig and therefore, the flow cut off points on the thrust signature could not be clearly differentiated. These MOVs were only dynamically tested and as-left thrust values were equal to or above the target thrust at design basis dp of 135 psig. The design basis differential pressure (dp) and target thrust are based on the mispositioning scenario which considered the pumps deadheading and no system pressure drop is occurring. Supplement 4 to G.L. 89-10 exempts BWR plants from consideration of the mispositioning scenario. Detroit Edison elected to consider the mispositioning scenario during the design basis for conservative Maximum Expected Differential Pressure (MEDP) and corresponding thrust requirements but did not dynamically test these MOVs under the mispositioning scenario. The MOVs stroked (open/close) during the dynamic testing with as-left thrust higher than the minimum design required thrust corresponding to MEDP. These valves are considered operable and capable of performing the safety function. Therefore, no further testing will be performed for these six MOVs.