



Northern States Power Company

414 Nicollet Mall  
Minneapolis, Minnesota 55401-1927  
Telephone (612) 330-5500

February 17, 1994

US Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT  
Docket No. 50-263 License No. DPR-22

Response to Request for Additional Information  
Regarding the Graded Approach for Generic Letter 89-10,  
Safety Related Motor-Operated Valve Testing Program

Northern States Power (NSP), in conjunction Wisconsin Electric Power, Wisconsin Public Service and Rochester Gas and Electric (the Cooperative Efforts Group) has proposed to the NRC Staff a graded approach program to verify the design-basis capability of safety-related motor operated valves (MOVs). Meetings were held at NRC headquarters on June 7, 1993, and October 18, 1993 between the NRC Staff and representatives of the Cooperative Efforts Group to discuss the Graded MOV Testing Program. By letter dated January 7, 1994 from Marsha Gamberoni (NRC) to Roger O. Anderson (NSP), the NRC Staff requested additional information concerning the graded approach MOV program. The Cooperative Efforts Group response to the request for additional information is provided as Attachment A to this letter.

We feel that our response will provide the necessary information to resolve your concerns. However, we request to meet with members of the NRC Staff at their earliest convenience to resolve issues which may remain subsequent to NRC review of this letter and discuss implementation of the graded approach MOV program.

Please contact Marv Engen, Sr Licensing Engineer, at (612) 295-1291 if you require further information.

Roger O. Anderson  
Director  
Licensing and Management Issues

- c: Regional Administrator - III, NRC
- Beth Wetzel, NRR Project Manager, NRC
- Marsha Gamberoni, NRR Project Manager, NRC
- Sr Resident Inspector, NRC
- State of Minnesota
- Attn: Kris Sanda

Attachment A: NRC Comments on a Graded Approach to Generic Letter 89-10  
and Cooperative Efforts Group Response

*Handwritten initials/signature*

9403070349 940217  
PDR ADDCK 05000263  
PDR

Attachment A

NRC Comments on a Graded Approach to  
Generic Letter 89-10 and Cooperative Efforts Group Response

NRC Comment:

1. *"As stated in paragraph 1 of Generic Letter 89-10, each licensee is required by 10 CFR 50.54(f) to notify the staff in writing of any changes to its commitments to GL 89-10 with justification retained on site. The Cooperative Efforts Group proposal for a "graded approach" to GL 89-10 constitutes a significant change to a licensee's commitment to test motor-operated valves (MOVs) where practicable and would require a written submittal notifying the staff of the change."*

Response:

The need to notify the NRC that our Generic Letter 89-10 schedule commitment has changed is acceptable and in accordance with Generic Letter 89-10 paragraph 1. Individual licensees will notify the NRC of commitment changes in writing per paragraph 1 of Generic Letter 89-10 when they are prepared to implement the Graded Motor Operated Valve (MOV) Testing Program.

NRC Comment:

2. *"In addition to changing its commitment to a graded approach, Monticello plans to extend its schedule for meeting its commitment to GL 89-10 beyond its original November 1994 completion date to Spring 1996. As indicated in paragraph 1 of GL 89-10, Monticello is required to notify the staff in writing of the schedule change. Supplement 6 to GL 89-10 (to be issued in the near future) will provide specific information that is needed by the staff to evaluate a licensee's justification for a change to its GL 89-10 schedule. Monticello should contact its NRR Project Manager to discuss the most efficient means of providing that information."*

Response:

Notification of the schedule change for the Monticello Nuclear Generating Plant is to be provided in the near future.

NRC Comment:

3. *"Monticello categorized its safety-related MOVs as either "important" or "unimportant" based on PRA and deterministic consideration. No concerns*

were identified with the licensee's prioritization of its MOVs in its GL 89-10 program. However, some of the reasons listed by the licensee of why an MOV could be considered "unimportant" are of concern (for example, redundancy). The staff would need to review each MOV placed into the "unimportant" category by a licensee."

Response:

The Cooperative Efforts Group proposes that a more effective use of resources would be realized by obtaining NRC concurrence that the Graded MOV Testing Program methodology is acceptable vice a review of each MOV categorized using the methodology. We believe that your December 3, 1993 response to NUMARC's "Guidelines for Optimizing Safety Benefits in Assuring the Performance of Motor Operated Valves" is consistent with the Cooperative Efforts Group proposal.

Implementation of the graded approach methodology does not remove any MOV from the scope of a licensee's Generic Letter 89-10 MOV Program, but rather it provides a method to justify alternative action in lieu of the design differential pressure testing specified in paragraph c of Generic Letter 89-10, as well as justification for risk based surveillance monitoring frequencies consistent with paragraph j of Generic Letter 89-10. Documentation of the specific justification for placing each of the MOVs into the category of low safety significance will be retained at the respective plant site, as required by Generic Letter 89-10.

It should be noted that establishing deterministic reasons (e.g., redundancy/diversity, acceptable challenge, etc.) why an MOV could be categorized as low safety significance, was only used to confirm the low safety significance of the MOV. The deterministic analysis resulted in 21 MOVs being moved to the high safety significance category. No MOVs were categorized as low safety significance based solely on the deterministic review.

NRC Comment:

4. "Monticello stated that the "important" safety-related MOVs would have their performance justified "per differential pressure test or through industry efforts or grouping". Monticello stated that the "unimportant" safety-related MOVs would have their performance justified by "test or engineering analysis". Upon request by an NRC inspector, each licensee is responsible for demonstrating that any safety-related MOV can perform its safety function. It is not clear how the licensee will implement these two methods of justifying the performance of "important" and "unimportant" safety-related MOVs. If a licensee chooses not to test an MOV even though such testing is practicable, Supplement 6 to GL 89-10 should be referred to for information on the important considerations in

*grouping MOVs for the application of test data from one MOV to another."*

Response:

The Graded MOV Testing Program as proposed by the Cooperative Efforts Group does not use valve grouping to apply dynamic testing of a subset of MOVs to a broader group of similar valves. The Graded MOV Testing Program is a methodology for establishing risk significance regardless of testing group. Individual members of the Cooperative Efforts Group may choose to employ MOV grouping for MOVs that are of high safety significance for which dynamic testing is not practicable.

For MOVs of relative high safety significance, the additional assurance provided by dynamic testing at the differential pressures and flows associated with the applicable accident conditions may limit a number of uncertainties associated with valve operability. For valves of high safety significance for which in-situ design basis testing is impracticable, comparison with appropriate test results or the two-stage approach as described in paragraph f of Generic Letter 89-10 is to be employed. The Cooperative Efforts Group concurs that emphasis on these MOVs is appropriate, including the additional assurance provided by dynamic testing and performance monitoring consistent with Generic Letter 89-10. Any valve groupings performed to address design differential pressure testing of the high safety significance MOVs will take into consideration the guidance in Supplement 6 to Generic Letter 89-10 (May 18, 1993 Draft).

For MOVs of relative low safety significance, the benefits provided by additional testing at design basis conditions (although the testing may be practicable) are limited because the reduction in uncertainties associated with valve operability has only a small impact on safety. The graded approach provides the rationale for establishing an acceptable level of testing to assure the health and safety of the public. The safety contribution established for the low safety significance MOVs justifies not testing at design basis conditions or requiring frequent periodic testing for these valves. This justification is established by crediting specific plant design features and operating characteristics for these MOVs such that the use of engineering analysis and static testing provides an acceptable level of quality and safety. However, based on industry experience, it is recognized that simply performing or repeating the original design analysis may not be sufficient to establish switch settings and assure valve operability. Therefore, engineering analysis performed to establish MOV operability will include available information from plant specific tests and generic industry efforts.

The industry has always accepted that we must demonstrate that safety-related MOVs can perform their safety function upon request. However, we believe that differential pressure testing only provides additional assurance of valve operability (i.e., it reduces the uncertainty associated with the MOV). The

following industry studies have concluded that the safety significance of a component should be a consideration in establishing the level of testing to provide assurance of component function:

NUMARC 93-05, "Guidelines for Optimizing Safety Benefits in Assuring the Performance of Motor Operated Valves",

BWROG Report NEDC-32264, "Application of Probabilistic Safety Assessment to Generic Letter 89-10 Implementation",

EPRI Report, "Application of PRA for the Development of the MOV Test Program Prescribed by Generic Letter 89-10", (Final Draft).

The Cooperative Efforts Group is convinced that the graded approach provides adequate assurance of valve operability.

NRC Comment:

5. *"Monticello indicated that static tests would be used in an effort to verify periodically the design-basis capability of safety-related MOVs. However, the licensee had not developed justification for the use of static test data to demonstrate design-basis capability. The licensee stated during the meeting that the "important" safety-related MOVs constitute 99.9% of the risk. If so, the licensee should consider using its graded-approach philosophy to enhance the basis of the method and increase the frequency for periodically verifying the design-basis capability of those "important" safety-related MOVs. The licensee proposes a 5 to 10 refueling cycle schedule for periodic verification of the design-basis capability of "unimportant" safety-related MOVs, but did not provide justification for this schedule beyond the recommended schedule in GL 89-10 for periodic verification."*

Response:

The 99.9% risk contribution presented during our October 18, 1993 meeting is not just the contribution of the high safety significance MOVs to overall plant risk. This value is the cumulative risk of the top 300 basic events in a Fussler-Vesely ranking for the Monticello plant. Failure of the high safety significance MOVs contributes to 10 of the top 300 basic events. These 10 MOV related events contribute 1.5% of the cumulative 99.9% plant risk. The risk contribution of these high safety significance MOVs is not a significant portion of the cumulative plant risk and thus the monitoring frequency per Generic Letter 89-10 is conservative. Note also that the remaining 50 MOVs in the Monticello Generic Letter 89-10 program contribute to the remaining 2300 basic events which are the remaining 0.1% of the cumulative risk to the plant. Thus these remaining MOVs have a very small effect on plant core damage frequency.

Paragraph j of Generic Letter 89-10 states (emphasis added):

"The program for the verification of the procedure outlined in item d., as well as other tests or surveillance that the owner may choose to use to identify potential MOV degradations or misadjustments, such as those described in Attachment A, should be implemented after maintenance or adjustment (including packing adjustment) of each MOV, and periodically thereafter. The Surveillance interval should be based on the licensee's evaluation of the safety importance of each MOV as well as its maintenance and performance history. The surveillance interval should not exceed 5 years or three refueling outages, whichever is longer, unless a longer interval can be justified...."

Paragraph d of Generic Letter 89-10 requires the utility to establish procedures to ensure that correct MOV switch settings are determined and maintained throughout the life of the plant including provisions to periodically monitor MOV performance to ensure the switch settings are correct.

The periodic verification of correct MOV switch settings and MOV performance for low safety significance MOVs on a 5 to 10 refueling cycle schedule is justified based on the results of our evaluation of the safety significance of the MOVs. The specific frequency for a valve will be established within this band based on the relative risk associated with the MOV, the environmental conditions the MOV is exposed to, and the performance history of the MOV. Consideration of these factors to establish the specific MOV monitoring frequency will be documented in the MOV program documentation. Similarly, periodic static testing performed on the low safety significance MOVs provides the requisite information to assure that the valves are properly set up to perform as required.

For MOVs of high safety significance, engineering analysis establishes the necessary switch settings. These settings are validated via differential pressure testing to the extent practicable to provide additional assurance of MOV function. Periodic performance verification for the high safety significance MOVs will satisfy the requirements of Generic Letter 89-10. The industry is pursuing resolution of the issue concerning the use of static testing for periodic performance verification.

NRC Comment:

6. *"Monticello indicated that static thrust tests would be used to demonstrate performance for post-maintenance testing. However, some maintenance might affect the performance of the valve that could only be revealed through dynamic testing. Also, some maintenance might affect the torque performance of the MOV."*

Response:

Where valve or actuator performance may be significantly affected by maintenance or modification (such that the expected results from previous differential pressure testing could be impacted) then dynamic testing (where practicable) will be considered and may be used to demonstrate MOV performance. This determination will be made on a case by case basis depending on the extent and type of maintenance or modification, performance margin of the MOV, initial performance justification method, and safety significance of the MOV.