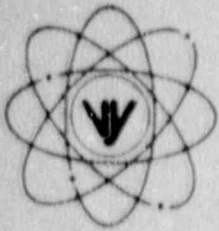


VERMONT YANKEE NUCLEAR POWER CORPORATION



Ferry Road, Brattleboro, VT 05301-7002

BVY 89-116

REPLY TO
ENGINEERING OFFICE
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(508) 779-6711

December 28, 1989

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

- References:
- a) License No. DPR-28 (Docket No. 50-271)
 - b) Letter, USNRC to All Licensees of Operating Nuclear Power Plants and Holders of Construction Permits for Nuclear Power Plants, NVC 89-144, Generic Letter 89-10, dated 6/28/89
 - c) Letter, VYNPC to USNRC, BVY 89-050, dated 6/8/89
 - d) Letter, USNRC to All Holders of Nuclear Power Reactor Operating Licenses (OLs) or Construction Permits (CPs) for Action, NVC 85-250 (IEB 85-03) dated 11/15/85

Dear Sir:

Subject: Response to Generic Letter No. 89-10: Safety-Related
Motor-Operated Valve Testing and Surveillance

In November 1985, the NRC issued Bulletin 85-03 [Reference d)] to all licensees requesting that they develop and implement a program to ensure that switch settings on certain safety-related motor-operated valves are selected, set, and maintained correctly to accommodate the maximum Differential Pressures (DPs) expected in these valves during both normal and abnormal events within the design basis.

In response, Vermont Yankee developed the required program and submitted a report on the results of our review and demonstration of the operational readiness of each motor-operated valve in the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) system [Reference c)].

By letter dated June 28, 1989 [Reference b)], the Office of Nuclear Reactor Regulation requested licensees to extend the scope of the program outlined in NRC Bulletin 85-03 [Reference d)] to include all safety related motor operated valves. In accordance with the reporting requirements set forth in the subject Generic Letter, Vermont Yankee herewith provides our response as Attachment 1 to this letter. The attachment responds to each of the Generic Letter recommendations. As described in the attachment, Vermont Yankee intends to extend the existing IEB 85-03 program to cover all MOV's Vermont Yankee determines to be within the scope of Generic Letter 89-10.

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ATTACHMENT 1

VERMONT YANKEE RESPONSE TO
GENERIC LETTER 89-10 RECOMMENDED ACTIONS

GENERIC LETTER ITEM "a"

Review and document the design basis for the operation of each MOV. This documentation should include the maximum differential pressure expected during both the opening and closing of the MOV for both normal operations and abnormal events, to the extent that these MOV operations and events are included in the existing approved design basis.

Response

The Vermont Yankee program for reviewing Motor Operated Valves (MOV) subject to IEB 85-03 requirements considered all aspects of valve operation to determine the highest maximum differential pressure (DP) each MOV would be required to operate against (including mispositioning).

Generic Letter 89-10, item "e", expands this design review to include other design basis information that could potentially have a significant influence on the amount of thrust required to operate a valve at a particular differential pressure.

INEL testing, noted within the Generic Letter, concludes that high flow is an additional contributor to the DP thrust requirement. Other factors such as fluid temperature and valve position may also increase thrust requirements. Even though MOV testing to date does not quantify these additional factors, future testing may. Therefore, Vermont Yankee believes that establishing complete design basis criteria for each valve, under both normal and abnormal plant conditions, where that valve is or could be operated, provides a good starting point for determining MOV switch settings.

Vermont Yankee will establish the following normal and abnormal (open and closed) design basis criteria for each MOV determined to be within the scope of Generic Letter 89-10.

1. Differential Pressure
2. Line Pressure
3. Fluid Flow
4. Fluid Temperature
5. Valve Orientation
6. Design Basis Minimum Voltage

Available torque (thrust), considering minimum voltage and available current, will subsequently be reviewed against the required torque (thrust) derived from the design conditions the valve must operate against.

GENERIC LETTER ITEM "b"

Using the results from Item a., establish the correct switch settings. This should include establishing a program to review and revise, as necessary, the methods for selecting and setting all switches (i.e., torque, torque bypass, position limit, overload) for each valve operation (opening and closing). One purpose of this letter is to ensure that a program exists for selecting and setting valve operator switches to ensure high reliability of safety-related MOV's.

Response

The Vermont Yankee final submittal [Reference c)] for IEB 85-03 provides the Vermont Yankee methodology for selecting, setting and maintaining Motor Operator switches.

Vermont Yankee's program for selecting and setting switches to comply with Generic Letter item "b" will be a continuation of the program established for the valves within the scope of IEB 85-03.

GENERIC LETTER ITEM "c"

Individual MOV switch settings should be changed, as appropriate, to those established in response to item b. Whether the switch settings are changed or not, the MOV should be demonstrated to be operable by testing it at the design-basis differential pressure and/or flow determined in response to item a. Testing MOV's at design-basis conditions is not recommended where such testing is precluded by the existing plant configuration. An explanation should be documented for any cases where testing with the design-basis differential pressure or flow cannot practicably be performed. This explanation should include a description of the alternatives to design-basis differential pressure testing or flow testing that will be used to verify the correct settings.

NOTE: This letter is not intended to establish a recommendation for valve testing for the condition simulating a break in the line containing the MOV. However, a break in the line should be considered in the analyses described in items a., b., and c. if MOV operation is relied on in the design basis.

Each MOV should be stroke tested to verify that the MOV is operable at no-pressure or no-flow conditions even if testing with differential pressure or flow cannot be performed.

Response

Differential pressure testing was performed to satisfy IEB 85-03 action item "c". This testing was specifically aimed at achieving a differential pressure reasonably close to that calculated to be the highest maximum differential pressure the valve could be subjected to. Few valves were available to choose from that met this single requirement consistent with safe operation of

the plant. The Generic Letter adds additional requirements (flow, temperature, etc.) to differential pressure, further reducing the valves to select from. Safe in-plant testing at design basis conditions has shown to be severely limited at Vermont Yankee. Since no guidance exists for establishing acceptable parameter limits, no additional differential pressure testing is contemplated by Vermont Yankee.

The intent of items "c" and "f" for verifying that switch settings are appropriate is fulfilled programmatically. The Vermont Yankee response [Reference c)] to IEB 85-03 contains DP testing results, demonstrating that the methods used by Vermont Yankee for selecting appropriate torque switch (thrust) setpoints is conservative.

Vermont Yankee uses a commercially available statistical database containing industry DP test results from valves other than "Walworth" valves. Most of the safety related valves at Vermont Yankee were manufactured by "Walworth". Differential pressure testing performed by the USNRC (INEL and in Germany) indicates that "Walworth" valves require less thrust for a particular DP than other valves. Since Vermont Yankee uses a statistical database composed of few if any "Walworth" valves, the resulting thrusts are inherently conservative when applied to Vermont Yankee's "Walworth" valves.

For non-"Walworth" valves, Vermont Yankee's conservative application of the statistical database containing industry differential pressure test results provides adequate assurance of MOV operability.

For MOV's determined to be within the scope of Generic Letter 89-10, Vermont Yankee intends to extend the use of diagnostic equipment for setting or verifying switch settings during static testing.

GENERIC LETTER ITEM "d"

Prepare or revise procedures to ensure that correct switch settings are determined and maintained throughout the life of the plant. These procedures should include provisions to monitor MOV performance to ensure the switch settings are correct. This is particularly important if the torque or torque bypass switch setting has been significantly raised above that required.

It may become necessary to adjust MOV switch settings because of the effects of wear or aging. Therefore, it is insufficient to merely verify that the switch settings are unchanged from previously established values. The switch settings should be verified in accordance with the program schedule (see item j.). The ASME Code Section XI stroke-timing test required by 10CFR Part 50 is not oriented toward verification of switch settings. Therefore, additional measures should be taken to adequately verify that the switch settings ensure MOV operability. The switch settings need not be verified each time the ASME Code stroke-timing test is performed.

Response

Procedures and design drawings are used for valves within the Vermont Yankee IEB 85-03 program [Reference c)] to ensure switch settings are determined and maintained throughout the life of the plant. Vermont Yankee's conservative method of determining switch settings adequately accounts for the effects of normal wear and aging. These controls will be applied to valves determined to be within the scope of Generic Letter 89-10.

Since the scope of the Vermont Yankee MOV program will be significantly increased from the IEB 85-03 program, an MOV maintenance guideline will be developed to direct work to applicable plant procedures and aid good maintenance practices. Even though Vermont Yankee's maintenance personnel are highly experienced, this will help ensure appropriate guidance and direction for consistent and complete application of testing, surveillance, repair and other maintenance activities.

GENERIC LETTER ITEM "e"

Regarding item a., no change to the existing plant design basis is intended and none should be inferred. The design-basis review should not be restricted to a determination of estimated maximum design-basis differential pressure, but should include an examination of the pertinent design and installation criteria that were used in choosing the particular MOV. For example, the review should include the effects on MOV performance of design-basis degraded voltage, including the capability of the MOV's power supply and cables to provide the high initial current needed for the operation of the MOV.

Response

The response to this item is included in the response to item "a".

GENERIC LETTER ITEM "f"

Documentation of explanations and the description of actual test methods used for accomplishing item c. should be retained as part of the required records for the MOV.

It is also recognized that it may be impracticable to perform in situ MOV testing at design-basis degraded voltage conditions. However, the switch settings established in response to item b. should at least be established to account for the situation where the valves may be called on to operate at design-basis differential pressure, or flow, and under degraded voltage conditions. If the licensee failed to consider degraded voltage, power supply, or cable adequacy for MOV's in systems covered by Bulletin 85-03, the design review and established switch settings for those MOV's should be re-evaluated.

Alternatives to testing a particular MOV in situ at design-basis pressure or flow, where such testing cannot practicably be performed, could include a comparison with appropriate design-basis test results on other MOV's, either in situ or prototype. If such test information is not available, analytical methods and extrapolations to design-basis conditions, based on the best data available, may be used until test data at design-basis conditions become available to verify operability of the MOV. If this two-stage approach is followed, it should be accomplished within the schedule outlined in item i, and would allow for MOV testing and surveillance to proceed without excessive delay.

Testing of the MOV's at design-basis conditions need not be repeated unless the MOV is replaced, modified, or overhauled to the extent that the licensee considers that the existing test results are not representative of the MOV in its modified configuration.

Response

A description of Vermont Yankee's method to verify operability is contained in the response to item "c"; based on this, the two-stage approach is not considered applicable to Vermont Yankee at this time.

The Vermont Yankee program does not utilize a "two stage" alternative to in situ differential pressure testing. Rather, for the expanded scope of MOV's under Generic Letter 89-10, Vermont Yankee proposes to utilize the existing methodology for setting MOV switches that has been successfully implemented for IEB 85-03 valves and was outlined in Reference c). Vermont Yankee believes this method meets the intent of the Generic Letter based upon the conservative manner in which the maximum differential pressures are calculated, the conservatively applied statistical database thrusts and our differential pressure testing. We will, however, continue to monitor industry and regulatory testing to ensure that the Vermont Yankee method of determining setpoints remains conservative.

Insufficient information exists today to determine if acceptable test data, from other valves or prototypical valves, can be gathered or completed, analyzed and incorporated into the Vermont Yankee scope of valves within the 5 year schedule required by item "f". Further, without sufficient guidance outlining the acceptability of data obtained by alternate methods, Vermont Yankee cannot estimate or provide an alternative schedule.

GENERIC LETTER ITEM "g"

A number of deficiencies, misadjustments, and degraded conditions were discovered by licensees, either as a result of their efforts to comply with Bulletin 85-03 or from other experiences. A list of these conditions (including improper switch settings) is included in Attachment A to this letter for licensee review and information.

Response

No response required by Vermont Yankee.

GENERIC LETTER ITEM "h"

Each MOV failure and corrective action taken, including repair, alteration, analysis, test, and surveillance, should be analyzed or justified and documented. The documentation should include the results and history of each as-found deteriorated condition, malfunction, test, inspection, analysis, repair, or alteration. All documentation should be retained and reported in accordance with plant requirements.

It is suggested that these MOV data be periodically examined (at least every 2 years or after each refueling outage after program implementation) as part of a monitoring and feedback effort to establish trends of MOV operability. These trends could provide the basis for a licensee revision of the testing frequency established to periodically verify the adequacy of MOV switch settings (see items d. and j.). For this monitoring and feedback effort, a well-structured and component-oriented system [e.g., the Nuclear Plant Reliability Data System (NPRDS)] is needed to capture, track, and share the equipment history data. The NRC encourages the use of the industry-wide, appropriately modified, for this purpose in view of the multiple uses for these data.

Response

Vermont Yankee reviews individual MOV failures when determining the applicable repair, corrective action, etc. Plant procedures presently exist for the retention of documentation and the review of failures for reportability.

For the current IEB 85-03 program, Vermont Yankee reviews applicable data on those valves that are worked on as part of the surveillance interval or after maintenance or adjustments. This review will be extended to MOV's determined to be within the scope of Generic Letter 89-10.

GENERIC LETTER ITEM "i"

Each licensee shall advise the NRC in writing, within 6 months of the date of this letter, that the above schedule and recommendations will be met. For any date that cannot be met, the licensee shall advise the NRC of a revised schedule and provide a technical justification in writing. For any recommendation that it cannot meet or proposes not to meet, the licensee shall inform the NRC and provide a technical justification, including any proposed alternative action, in writing.

Response

The proposed schedule outlined within item "i" can be met with the exception of the two stage approach delineated by item "f" as an alternative to in situ differential pressure testing.

The Vermont Yankee response to item "f" provides an explanation of the program to be used as an alternative to in situ differential pressure testing and the two stage approach.