UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO ALTERNATIVE GVRR-6

NINE MILE POINT NUCLEAR STATION, UNIT NO. 2

DOCKET NO. 50-410

1.0 INTRODUCTION

The Code of Federal Regulations (10 CFR) Section 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (the ASME Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, a licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to the ASME Code requirements determined to be acceptable to the Nuclear Regulatory Commission (NRC) staff. Further guidance was given in GL 89-04, Supplement 1, NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

Nine Mile Point Nuclear Station, Unit 2 (NMP2), is currently implementing its second 10-year IST interval. This interval began on April 6, 1998, and is scheduled to end on April 5, 2008. The IST program was developed in accordance with the 1989 Edition of the ASME Code, Section XI, which references Operations and Maintenance (OM) Standard Part 10 for IST of valves. OM-10 further directs that relief valve testing be performed in accordance with OM-1987, Part 1 (OM-1).

By letter dated March 24, 1999, Niagara Mohawk Power Corporation (NMPC or the licensee) proposed an alternative to the requirements of OM-1 for Nine Mile Point Nuclear Station, Unit 2 (NMP2). The alternative is designated General Valve Relief Request 6 (GVRR-6). NMPC's proposed alternative and basis regarding OM-1, and the NRC's evaluation, is given below.

2.0 PROPOSED ALTERNATIVE GVRR-6

NMPC requests relief from the accumulator volume requirements of OM-1 paragraphs 4.1.1.2 and 4.1.2.2 for Class 2 and 3 safety and relief valves used in steam or other compressible fluid

Enclosure

service. The proposed alternative is to use the requirements of Appendix I of the 1995 OM Code, paragraphs 4.1.1(b) and 4.1.2(b).

2.1 Licensee's Proposed Alternative Testing

NMPC proposes:

> Pursuant to 10 CFR 50.55a(a)(3), for safety valves and relief valves used in compressible fluid service (air and steam), a test device shall be acceptable if, in accordance with OM-1995 Sections I 4.1.1(b) and I 4.1.2(b), the combination of accumulator volume under the valve inlet and pressure source flow rate is sufficient to determine the valve set-pressure. With the exception of the accumulator volume requirements, all other aspects of safety valve and relief valve testing shall be conducted in accordance with OM-1987, Part 1 (OM-1). This proposed alternative shall be effective for relief valve testing under OM-1, 1981 and OM-1, 1987 in both the first ten-year IST interval and the subsequent ten-year IST intervals.

2.2 Licensee's Basis for Requesting Relief

NMPC states:

> The proposed alternative is justified on the basis that it provides an acceptable level of quality and safety.
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> Since September 1996, Niagara Mohawk Power Corporation has conducted bench testing of safety and relief valves with a new test bench that does not contain an accumulator beneath the valve inlet. The relief valves tested on this bench exhibit positive popping characteristics without chatter or seat damage.
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> OM-1, as incorporated by reference in ASME Section XI 1989 Edition, specifically requires a minimum accumulator size for relief valve testing. The applicable Code used for relief valve testing prior to OM-1 was PTC 25.3-1976, as required by IWV-3512 of ASME Section XI, 1983 Edition, Summer 1983 Addenda. The PTC did not specify an accumulator volume for bench testing. Instead it stated that "bench testing may also be permitted with test stands having limited accumulator volume and/or pressure source capacity." The PTC goes on to specify that these bench tests may only be used for determination of the valve set-pressure and valve leakage.
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> Appendix I of OM-1995 (through OMb-1997 Addenda) and Appendix I of OM-1998, while not currently endorsed by the NRC, deleted the accumulator volume calculation and specify in Sections I 4.1.1(b) and I 4.1.2 (b) that, "The volume of the accumulator drum and the pressure source flow rate shall be sufficient to determine the valve set-pressure."
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> NMPC believes that the purpose of the minimum accumulator volume specified in OM-1 is to ensure that there is sufficient pressure and flow to prevent seat or disc damage during setpoint testing due to valve "chattering." NMPC proposes that a physical volume identifiable as an "accumulator" is not necessary to satisfy the requirement in OM-1995

that "the volume of the accumulator drum and the pressure source flow rate shall be sufficient to determine the valve set-pressure."

Set-pressure testing of relief valves conducted since September 1996 on a test bench without an accumulator, demonstrated satisfactory valve set-pressure characteristics. The test bench used is connected to a high pressure (at least double the relief valve set pressure) air cylinder through a pressure regulator and a needle test valve. The test procedure requires at least two consecutive "pops" within 3% of the valve set-pressure. This demonstrates that the test bench volume, combined with the air cylinder volume and flow rate, is sufficient to determine the valve set-pressure. Additionally, the post-testing seat leakage required by OM-1 demonstrates that no valve seat or disc damage occurs during set pressure testing. The current test bench provides consistent results (as demonstrated by two consecutive "pops" within 3% of the valve set pressure) and does not result in chattering or valve seat or disc damage (as demonstrated by an acceptable as-left seat leakage test).

To summarize, the test method provided by the relief valve test bench without an accumulator is consistent with the test method prescribed by the 1983 ASME Section XI, OM-1995, and OM-1998. Only OM-1-1987 (endorsed by ASME Section XI, 1989 Edition) requires a specific accumulator volume for the relief valve test bench. The use of the safety/relief valves test bench without an accumulator provides a set-pressure testing method consistent with the requirements of PTC 25.3-1976 and OM-1995.

Therefore, the proposed alternative is justified based on the fact that it provides an acceptable level of quality and safety.

3.0 NRC STAFF EVALUATION

This is a general alternative (a.k.a., "relief request") for Class 2 and Class 3 safety and relief valves used for steam or other compressible fluid service. The function of safety and relief valves is to provide over-pressure protection to the associated systems. The Code OM-1 paragraphs 4.1.1.2 and 4.1.2.2 require that a minimum accumulator volume, below the valve inlet, be calculated by multiplying the valve capacity by the time needed to open and dividing by 10.

More recent editions of the Code eliminate the need to calculate a minimum accumulator volume. ASME OM Code-1995, Appendix I, Paragraphs 4.1.1(b) and 4.1.2(b) state that the volume of the accumulator drum and pressure source flow rate shall be sufficient to determine the valve set pressure. NMPC proposes to use this alternative testing method.

The NRC staff has determined that, when using the method described by NMPC which involves repeated tests to determine the setpoint without damaging the safety and relief valves, it is not necessary to specify a minimum size accumulator. Therefore, the NRC staff finds this alternative method to be acceptable because it provides an adequate method to establish the setpoint of the relief valve that is equivalent to that provided by ASME OM-1 Code-1987 paragraphs 4.1.1.2 and 4.1.2.2. The proposed alternative provides an acceptable level of quality and safety. This alternative is authorized for NMP2's second 10-year IST interval program and all subsequent intervals.

NMPC also requested in its March 24, 1999, letter, that the above alternative be authorized for the first 10-year interval. NMPC states that a 1-year extension of the 10-year interval is allowed by the ASME Code, and that provision will be used to extend NMP2's first 10-year interval until April 5, 1999. The NRC staff, however, does not agree that NMP2's Code of record for the first 10-year IST interval (1983 Edition of the ASME Code, Section XI) allows a 1-year extension of the first 10-year interval. The second 10-year interval for NMP2, which began on April 6, 1998, is currently in effect and, therefore, no relief is required. Although it is unnecessary for the NRC staff to authorize alternatives to Code requirements from prior 10-year IST intervals, the NRC staff finds that NMPC's proposed alternative, authorized above, that was also used in the first 10-year interval, provided an equivalent level of quality and safety to the requirements of Section XI of the ASME Code during the first 10-year interval. Accordingly, the NRC staff concludes that the relief valve testing performed during the first 10-year interval constitutes a technically adequate and valid test to determine relief valve set-pressure and to ensure valve operability.

4.0 CONCLUSION

Use of the 1995 Edition of ASME OM Appendix I, paragraphs 4.1.1(b) and 4.1.2(b) for Class 2 and 3 safety and relief valves used for steam and other compressible fluid service, is authorized pursuant to 10 CFR 50.55a(a)(3)(i). This alternative method provides an acceptable level of quality and safety and is authorized for NMP2's second 10-year IST interval and for the remainder of NMP2's operating life.

Principal Contributor: M. Kotzalas

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