October 11, 2000

Mr. Mike Reandeau
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SUBJECT: CLINTON POWER STATION - SAFETY EVALUATION OF RELIEF REQUESTS FOR THE INSERVICE TESTING PROGRAM (TAC NO. MA9263)

Dear Mr. Reandeau:

By letter dated June 14, 2000, you submitted two requests for relief from the inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME)/ American National Standards Institute (ANSI), Operations and Maintenance (OM) Standards, Part 10, for the Clinton Power Station. In the Relief Request (RR) 2201 Revision 0 and RR 2202 Revision 0, you proposed alternatives with regard to performing IST activities on-line or during refueling outages and the use of indirect flow measurements, respectively, for certain pump discharge check valves in the shutdown service water system.

The applicable code of record for the Clinton Power Station IST program is the 1989 Edition of the ASME Boiler and Pressure Vessel (B&PV) Code, Section XI, Subsection IWV, which defers to the requirements of the ASME/ANSI OMa-1988 Standard, Part 10. In RR 2201 Revision 0 and RR 2202 Revision 0, the licensee proposes the alternatives for use at the Clinton Power Station during the second ten-year IST interval.

The Nuclear Regulatory Commission (NRC) staff has evaluated RR 2201 and 2202 including the proposed alternatives, and the staff finds that the alternatives provide an acceptable level of quality and safety. On this basis, the staff concludes that the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(i) for use at the Clinton Power Station during the second ten-year IST interval. Our safety evaluation is enclosed.

Sincerely,

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

AMERGEN ENERGY COMPANY, LLC,

CLINTON POWER STATION

DOCKET NO. 50-461

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves are performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code applicable Edition and Addenda, except where relief has been requested and granted or proposed alternatives have been authorized by the Commission pursuant to 10 CFR 50.55a(f)(6)(i), or (a)(3)(i), or (a)(3)(ii). In order to obtain authorization or relief, the licensee must demonstrate that (1) conformance is impractical for its facility; (2) the proposed alternative provides an acceptable level of quality and safety; or (3) compliance would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a, the Commission may grant relief from or authorize proposed alternatives to the ASME Code requirements upon making the necessary findings. The Nuclear Regulatory Commission (NRC) staff's findings with respect to the proposed alternatives are contained in this safety evaluation (SE).

2.0 LICENSEE'S RELIEF REQUEST SUBMITTAL

By letter dated June 14, 2000, AmerGen Energy Company, LLC, submitted two requests for relief from the IST requirements of the ASME/American National Standards Institute (ANSI), Operations and Maintenance (OM) Standards, Part 10, for the Clinton Power Station. The applicable code of record for the Clinton Power Station IST program is the 1989 Edition of the ASME B&PV Code, Section XI, Subsection IWV, which defers to the requirements of the ASME/ANSI OMa-1988 Standard, Part 10. In the Relief Request (RR) 2201 Revision 0 and RR 2202 Revision 0, the licensee proposes alternatives with regard to performing IST activities on-line or during refueling outages and the use of indirect flow measurements, respectively, for certain pump discharge check valves in the shutdown service water (SX) system. In RR 2201 Revision 0 and RR 2202 Revision 0, the licensee proposes the alternatives for use during the second ten-year IST interval.

3.0 RR 2201 REVISION 0

In RR 2201, the licensee requests relief from the requirements of ASME/ANSI OMa-1988 Standard, Part 10, paragraphs 4.3.2.2 (e) and 4.3.2.4 (c), for the SX system pump discharge

check valves 1SX001A and 1SX001B. Paragraphs 4.3.2.2 (e) and 4.3.2.4 (c), provide code alternatives for quarterly IST that require full-stroke exercising and for demonstrating valve obturator movement, respectively, during refueling outages. The licensee requests relief from the requirement to only perform the check valve IST activities during the refueling outages. The licensee proposes to perform a quarterly partial-flow test and a full-flow test or valve disassembly during refueling outages or during reactor operation on an 18-month interval basis.

3.1 Licensee's Basis for Relief

The pump discharge check valves do not have external disk position indicators or manual disc exerciser capability, and the use of nonintrusive methods are not practicable because the SX system flow through the 30-inch swing check valves is insufficient to effect a disc backstop impact.

Disassembly of the SX system pump discharge valves is an option only when full-stroke exercising on a quarterly basis is not practicable. Disassembly of the valves requires draining a large volume of coolant from the SX system, which increases the system unavailability and introduces the potential for valve damage during the maintenance.

A system configuration which provides full accident flow through all the safety-related components with the plant on-line is possible. IST of valves 1SX001A and 1SX001B in this configuration requires pumping lake water into the fuel pool cooling and cleaning (FPCC) system, which is cooled by demineralized water. After completion of the IST activities the lake water must be drained from the from the FPCC system heat exchanger. The drained water must be transferred to 55 gallon drums, and tested for contamination prior to release to the onsite sediment pond. This flow test configuration results in the inoperable of two safety-related coolers. Therefore, performance of this full-flow IST activity on a quarterly basis increases plant risk and decreases system availability.

A quarterly partial-flow test will be continued to demonstrate valve operability. The partial IST flow rate is approximately 85 percent of the full accident flow rate. The additional flow rate required to achieve the full accident flow is expected to produce a very small change in the disc position because of the size of the valves. The partial-flow test will demonstrate proper valve function.

The accident condition flow test or disassembly will be performed on the same frequency as required by the code, except that the test may be performed during reactor operation.

3.2 Proposed Alternative

In RR 2201, the licensee's proposed alternative for check valves 1SX001A and 1SX 001B is to perform a quarterly partial-flow test of the valves during the SX pump operability test, and a full-flow test or disassembly of the check valves either during refueling outages as allowed by the Code or on-line every 18-months.

3.3 Evaluation

In RR 2201, the licensee proposes as an alternative for the IST of SX system pump discharge check valves 1SX001A and 1SX001B, to change the time period for the performance of the IST activities required by ASME/ANSI Standard, Part 10, paragraphs 4.3.2.2 (e) and 4.3.2.4 (c). Paragraph 4.3.2.2 (e) specifies that if valve quarterly full-stroke exercising is not practicable during plant operation or cold shutdowns, it may be limited to refueling outages. Paragraph 4.3.2.4 (c) allows for valve disassembly to verify operability of the valve during refueling outages, as options to the other methods of demonstrating obturator movement by (a) exercising the valve and observing disc movement by a direct indicator, or other positive means or (b) the use of a mechanical exerciser.

The licensee proposes to continue to perform quarterly partial-flow testing of the valves during the SX pump operability tests and also perform a full-flow test or valve disassembly during refueling outages or on-line in lieu of full-flow testing only during refueling outages.

The staff's evaluation of RR 2201, is based on the licensee's proposed alternative and the following considerations that: 1) full-flow quarterly tests increase risk and decrease availability; 2) the check valves do not have external position indicators or manual exercise capability; 3) the lack of sufficient system flow for achieving a backstop impact diminishes the practical use of nonintrusive methods; 4) a quarterly partial-flow test will be continued at 85 percent of full flow; 5) there are no technical barriers to performing these IST activities either during the refueling outages or on-line; and 6) there are only two valves per fuel cycle that require the performance of the alternative IST activities on-line. Based on its evaluation of the proposed alternative and considerations, the staff finds that the alternative proposed in RR 2201 Revision 0 provides an acceptable level of quality and safety, and is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

4.0 R 2202 REVISION 0

In RR 2202, the licensee requests relief from the requirements of ASME/ANSI OMa-1989 Standard, Part 10, paragraph 4.3.2.4 (a), for the SX system pump discharge check valve 1SX001C. Paragraph 4.3.2.4 (a) requires that the check valve obturator movement be demonstrated by direct observation of position indicating devices, or other by other indicators such as flow rate, level, temperature, seat leakage testing, or other positive means.

4.1 Licensee's Basis for Relief

Full-stroke exercising of the SX system pump discharge check valve 1SX001C on a quarterly basis can be satisfied by passing the accident flow rate through the valve by aligning system loads that are the same as the accident conditions. However, the worst case assumption during the accident requires initiating backwash flush through the SX backwash strainer. The SX system flow measured by the installed flow element does not account for the flow diverted to flush the backwash strainer. The backwash strainer flush line that diverts the flow is located upstream of the flow measuring element and downstream of the SX system pump discharge valve 1SX001C. The piping configuration for the flush line does not allow for installing temporary flow measuring equipment.

Valve 1SX001C does not have an external disc position indicator or manual exerciser capability. Nonintrusive techniques are not practicable because the flow through the system is not sufficient to cause a disc backstop impact. Therefore, full-stroke position of the obturator cannot be verified by these methods.

Passing design flow to all safety-related components with the backwash system in operation duplicates the worst case conditions assumed during the accident. This IST configuration provides assurance that the check valve will perform its intended function because the test exercises the valve obturator to the position required to perform its safety function.

4.2 Proposed Alternative

In RR 2202, the licensee proposed as an alternative to perform a full-flow test on a quarterly basis with all accident condition flow aligned to the system. The total flow downstream of check valve 1SX001C, except for the backwash strainer, will be measured at the installed flow measuring element and confirmed to be at or above the total safety-related design flow. Concurrent full flow through the backwash strainer will be verified by observing that the strainer motor is operating and the backwash strainer valve is in the open position. The acceptance criteria for the IST of check valve 1SX001C will be that the flow limit to the safety-related components downstream, excluding the strainer backwash flow, is met or exceeded.

4.3 Evaluation

In RR 2202, the licensee requests relief from the requirements of ASME/ANSI OMa-1988 Standard, Part 10, paragraph 4.3.2.4 (a), for the SX system pump discharge check valve 1SX001C. Paragraph 4.3.2.4 (a) requires that the necessary valve obturator movement be demonstrated by exercising the valve and observing the obturator travel by direct indicators, or other positive means. The licensee's proposed alternative for demonstrating the SX system pump discharge check valve obturator movement is to use an indirect flow measurement in lieu of direct indications or other positive means. The licensee proposes to measure the flow downstream of the check valve using the installed flow measuring element, but exclusive of the flow diverted via the strainer backwash drain line to the lake. The strainer backwash drain line is located in the discharge line between the check valve and flow measuring element. In the RR 2202, the licensee indicates that intermittent flow through the strainer during the backwash cycle increases the flow approximately 200 gpm. The flow from the check valve discharge line that passes through the measuring element discharges directly into system safety-related components.

In RR 2202, the licensee proposes to perform a full-flow quarterly test by passing accident flow through the valve by aligning the system so the flow loads are the same as accident conditions. In addition to the system loads, the worst case assumption includes initiating backwash through the SX strainer during the accident. In the relief request, the licensee indicates that passing the design flow to all safety-related components while the backwash system is operating duplicates the conditions assumed during the accident, therefore it is demonstrated that check valve 1SX001C will perform its safety function.

The licensee's acceptance criteria for the IST is that the flow limit to the safety-related components, excluding strainer backwash flow, will be met or exceeded. The total flow to all safety-related components downstream of check valve 1SX001C, except for the backwash strainer, will be measured at the installed flow measuring element and confirmed to be at or above the total safety-related design flow. Concurrent full flow through the backwash strainer will be verified by observation that the strainer motor is operating and the backwash strainer valve is in the open position.

The staff's evaluation is based on the licensee's proposed alternative and the following considerations that: 1) the flow through a check valve includes worst case accident assumptions; 2) the piping configuration does not provide space to install temporary flow measuring equipment; 3) concurrent full flow through the backwash strainer will be verified by observation of the strainer motor operation and the open position of the strainer valve; and 4) the flow from the SX pump discharge valve will be measured and verified to an acceptance criterion that demonstrates that the flow limit to the connected safety-related components downstream of the measuring element is met or exceeded. Based on its evaluation of the proposed alternative and considerations, the staff finds that the alternative proposed in RR 2202 Revision 0, provides an acceptable level of quality and safety, and is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

5.0 CONCLUSION

The NRC staff concludes that the licensee's alternatives to perform a quarterly partial-flow test and a full-flow test or valve disassembly on-line or during refueling outages on an 18-month basis as described in RR 2201 Revision 0 and to perform a full-flow quarterly test by passing accident flow rate through the valve by aligning system loads that are the same as accident conditions, including the worst case accident assumption of initiating backwash flow through the SX strainer, as described in RR 2202 Revision 0, are authorized pursuant to 10 CFR 50.55a(a)(3)(i) for use at the Clinton Power Station during the second ten-year IST interval, on the basis that the alternatives provide an acceptable level of quality and safety.

Principal Contributor: F. Grubelich

Date: October 11, 2000