July 2, 2004

Mr. Christopher M. Crane
President and Chief Executive Officer
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1), REQUEST FOR RELIEF (P5) FOR THE NUCLEAR SERVICE CLOSED COOLING WATER (NSCCW) PUMPS FOR THE THIRD 10-YEAR INSERVICE TESTING (IST) INTERVAL (TAC NO. MC0856)

Dear Mr. Crane:

By letter dated September 24, 2003, and supplemented March 10, 2004, AmerGen Energy Company, LLC (the licensee), submitted to the Nuclear Regulatory Commission (NRC), a request (P5) for relief from the requirements of the American Society for Mechanical Engineers (ASME), *Boiler and Pressure Vessel Code* (Code), OM [operations and maintenance] Code-1987, "Operation and Maintenance of Nuclear Power Plants," Part 6, including the OMa-1988 Addenda, for the TMI-1 NSCCW pumps. After discussions with the NRC staff, the licensee revised the request in its letter dated March 10, 2004. The NRC staff has completed its review of relief request P5.

The NRC staff concludes that the licensee's request for relief may be granted pursuant to Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.55a(f)(6)(i) on the basis that compliance with the ASME Code requirements is impractical. The NRC staff further concludes that granting the relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. The licensee's proposed alternative to test the NSCCW pumps in paired operation on a quarterly basis and test the pumps individually during refueling outages provides reasonable assurance of the operational readiness of the NSCCW pumps. The relief is granted for the remainder of the third 10-year interval IST program.

The NRC staff's safety evaluation is enclosed. If you have any questions regarding this approval, please contact the TMI-1 Project Manager, Mr. Timothy G. Colburn, at (301) 415-1402.

Sincerely,

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure: Safety Evaluation

cc w/encl: See next page

The NRC staff's safety evaluation is enclosed. If you have any questions regarding this approval, please contact the TMI-1 Project Manager, Mr. Timothy G. Colburn, at (301) 415-1402.

Sincerely,

/RA/

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1),

RELIEF REQUEST P5 FOR THE THIRD 10-YEAR INSERVICE TESTING (IST) INTERVAL

AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-289

1.0 INTRODUCTION

By letter dated September 24, 2003, and supplemented March 10, 2004, AmerGen Energy Company, LLC (the licensee), requested Nuclear Regulatory Commission (NRC) approval of a proposed alternative to the IST requirements for nuclear service closed cooling water (NSCCW) pumps at TMI-1. The licensee proposed to test the NSCCW pumps in paired operation on a quarterly basis and test the pumps individually during refueling outages. After discussions with the NRC staff, the licensee revised the request by letter dated March 10, 2004.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a, requires that IST of certain American Society of Mechanical Engineers (ASME), *Boiler and Pressure Vessel Code* (Code), Class 1, 2, and 3 pumps and valves be performed at 120-month IST program intervals in accordance with the specified 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, the 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 which are acceptable to the staff. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, “Guidelines for Inservice Testing at Nuclear Power Plants.”

The TMI-1 third 10-year IST interval commenced September 22, 1995. The program was developed in accordance with the 1989 ASME Code, Section XI, which references the 1987 edition with 1988 addenda of the ASME/ANSI OM Standard, Part 6. ASME/ANSI OMa-1988, Part 6, paragraph 5.1 requires quarterly testing of pumps. ASME/ANSI OMa-1988, Part 6, paragraph 4.6.5 requires flow rate measurement of each pump. ASME/ANSI OMa-1988,

ENCLOSURE

Part 6, paragraph 5.2 requires that flow rate be determined during pump testing and that allowable ranges be established for test parameters per Table 3.

The NRC's findings with respect to authorizing alternatives and granting or denying the IST program relief request are given below.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Basis for Requesting Relief

The NSCCW system includes four 33.33-percent capacity nuclear services coolers, and three 50-percent capacity NSCCW pumps. This system, along with the intermediate cooling system, satisfies the cooling requirements of all nuclear-oriented services other than decay heat and reactor building emergency cooling. In the event of a loss-of-coolant accident, 100-percent redundancy of all nuclear services equipment is obtained by isolating nonessential items so that flow requirements are reduced to approximately half that of normal operation. Normally, with two pumps in service, system flowrate is approximately 5,500 gpm or greater, as compared to a single pump accident-required design flowrate of 1,972 gpm. Individual pump testing demonstrates a flowrate that is 25 percent greater than the single pump, accident-required design flowrate of the NSCCW pumps.

The system has three pumps that are arranged in parallel and run in pairs by design. To ensure adequate cooling to system heat loads, two pumps are normally in service. The flow instrumentation for these pumps is a single flow indicator located in the common piping for all three pumps. Consequently, flow for any given pump can only be measured when a single pump is in operation. The current piping configuration does not allow installation of individual pump flow instrumentation due to insufficient straight runs of pipe in the pump discharge lines. Each pump has an individual suction pressure gauge and an individual discharge pressure gauge. The pressure and flow instruments meet the accuracy requirements specified by the ASME Code.

System flow/heat removal requirements mandate that two pumps be kept in service while the unit is at power per the plant design. As a result, individual pump flow can not be determined during the operating cycle without causing the potential to overheat components essential to power operation. The proposed alternative would provide a quarterly assessment of paired pump mechanical and hydraulic performance and a refueling frequency assessment of single pump mechanical and hydraulic performance.

The quarterly tests to measure paired pump performance coupled with the refueling outage test to measure individual pump flow rates and routine preventative maintenance ensure the system will be capable of performing its accident design function and that any pump degradation is identified. The alternate testing regime will ensure continued operability of the NSCCW pumps.

3.2 Licensee's Proposed Alternative to ASME Code Testing Requirements

The NSCCW pumps will be tested in paired operation on a quarterly basis. Additionally, allowable ranges will be established for test parameters per OMa-1988, Part 6, Table 3. If acceptance criteria are not met, an analysis will be made to demonstrate that pump operability is not impaired and the pump will still fulfill its safety function. If the analysis cannot support the

operability of the pump, the pump will be repaired or replaced. Individual pump testing will be performed during refueling outages.

3.3 Evaluation

The ASME Code requires that safety-related pumps be tested individually to detect a deviation in hydraulic and mechanical performance at points of operation readily duplicated during subsequent tests. These points of operation, referred to as reference values, are the baseline points from which the acceptance criteria are established. The licensee requests relief from the requirement to measure individual pump flow rate quarterly as required by OM-6.

The NSCCW pumps are operated in pairs by design to satisfy system heat load requirements while operating at power. The flow instrumentation for the NSCCW pumps is a single flow indicator located in the common piping for all three pumps. Consequently, flow for any given pump can only be measured when a single pump is in operation. The current piping configuration does not allow installation of individual pump flow instrumentation due to insufficient straight runs of pipe in the pump discharge lines. Installation of individual flow instrumentation would require system redesign and modification, which would be costly and burdensome to the licensee. Each pump has an individual suction pressure gauge and an individual discharge pressure gauge. The pressure and flow instruments meet the accuracy requirements specified by the ASME Code.

The licensee has proposed to use paired pump testing on a quarterly basis in order to meet the ASME Code requirements. Hydraulic and mechanical acceptance criteria will be established for test parameters per OMa-1988, Part 6, Table 3. If acceptance criteria are not met, an analysis will be made to demonstrate that pump operability is not impaired and the pump will still fulfill its safety function. If the analysis cannot support the operability of the pump, the pump will be repaired or replaced. In addition to paired pump testing on a quarterly basis, the licensee will perform individual pump testing during refueling outages.

With respect to granting relief to perform paired pump testing on a quarterly basis in order to meet the ASME Code requirements, the NSCCW system is not currently designed to either operate or be tested with only one pump operating during power operation. In order to test the pumps individually at power, significant modifications to the system would be required. Therefore, the licensee has demonstrated that it is impractical to test these pumps individually while operating at power.

The licensee's alternative to perform paired pump testing on a quarterly basis and perform individual pump testing during refueling outages provides reasonable assurance of pump operational readiness and permits timely detection of pump performance degradation.

4.0 CONCLUSION

The NRC staff concludes that the licensee's request for relief is granted pursuant to 10 CFR 50.55a(f)(6)(i) on the basis that compliance with the ASME Code requirements is impractical. The NRC staff further concludes that granting the relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. The licensee's proposed alternative to test the NSCCW pumps in paired operation on a

quarterly basis and test the pumps individually during refueling outages provides reasonable assurance of the operational readiness of the NSCCW pumps. The relief is granted for the remainder of the third 10-year interval IST program.

5.0 REFERENCES

1. *U.S. Code of Federal Regulations*, "Domestic Licensing of Production and Utilization Facilities," Part 50, Chapter I, Title 10, "Energy," Section 50.55a(a)(3)(i).

2. American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code, Code for Operation and Maintenance of Nuclear Power Plants*, 1987 edition with 1988 addenda, New York, NY.

3. U.S. Nuclear Regulatory Commission, "Guidance on Developing Acceptable Inservice Testing Programs," Generic Letter 89-04, through Supplement 1, April 4, 1995.

4. U.S. Nuclear Regulatory Commission, "Guidelines for Inservice Testing at Nuclear Power Plants," NUREG-1482, April 1995.

5. M.P. Gallagher, AmerGen Energy Company, LLC, letter to the Nuclear Regulatory Commission, "Submittal of a Relief Request to the Requirements of 10 CFR 50.55a Concerning Third and Fourth Ten-Year Interval Inservice Testing Program," September 24, 2003.

6. M.P. Gallagher, AmerGen Energy Company, LLC, letter to the Nuclear Regulatory Commission, "Submittal of a Revised Request for Relief to the Requirements of 10 CFR 50.55a Concerning Third Ten-Year Interval Inservice Testing Program," March 10, 2004.

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Date: July 2, 2004

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