

February 3, 2000

Mr. H. B. Barron  
Vice President, McGuire Site  
Duke Energy Corporation  
12700 Hagers Ferry Road  
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION, UNITS 1 AND 2 - RE: RELIEF REQUESTS  
FOR THE PUMP AND VALVE INSERVICE TESTING PROGRAM, (TAC NOS.  
MA6823 AND MA6824)

Dear Mr. Barron:

By letter dated September 9, 1999, Duke Energy Corporation (DEC) submitted Revision 25 of Pump and Valve Inservice Testing Program, Second 10-year Interval. The revision contained three new generic valve relief requests. DEC requested the NRC staff to approve proposed alternatives MC-GRV-1, MC-GRV-02, and MC-GRV-03 for the McGuire Nuclear Station, Units 1 and 2. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a, the staff has reviewed the proposed relief requests against the requirements of the 1989 Edition of American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code*.

The staff finds that the alternatives proposed in MC-GRV-01 and MC-GRV-03 meet the requirements of the 1995 ASME/ANSI Operations and Maintenance (OM) Code which has been incorporated by reference into 10 CFR 50.55a (64 FR 51370). Therefore the alternatives are approved pursuant to 10 CFR 50.55a(f)(4)(iv). The alternative described in MC-GRV-02 is authorized pursuant to 10 CFR 50.55a(a)(3)(i), because it provides an acceptable level of quality and safety. The above alternatives are approved or authorized, as applicable, for the second 10-year interval.

The staff considers this matter resolved and is closing out TAC Nos. MA6823 and MA6824.

Sincerely,

**/RA/**

Richard L. Emch Jr., Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-369 and 50-370

Enclosure: Safety Evaluation

cc w/encl: See next page



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE TESTING PROGRAM, SECOND 10-YEAR INTERVAL

DUKE ENERGY COMPANY

MCGUIRE NUCLEAR STATION UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

1.0 INTRODUCTION

Title 10 of 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 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 Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

In a letter dated September 9, 1999, Duke Energy Corporation (the licensee), submitted Revision 25 of the Pump and Valve Inservice Testing Program. Revision 25 replaces Revision 24 for Unit 1 and Revision 19 for Unit 2. Subsequent revisions will be common for both units. Revision 25 contained three new relief requests.

McGuire Nuclear Station is currently implementing its second 10-year IST interval. For Unit 2, this interval began on March 1, 1994, and is scheduled to end on February 29, 2004. The interval for Unit 1 began on December 1, 1992. The scheduled end date for the Unit 1 interval has been extended to coincide with the interval for Unit 2. The IST program is developed in accordance with the requirements of the 1989 Edition of the ASME Code by implementation of the 1987 ASME/ANSI Operations and Maintenance (OM) Standards Part 1, Part 6, and Part 10 (OM-1, OM-6, and OM-10) for IST of safety and relief devices, pumps, and valves.

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

## 2.0 RELIEF REQUESTS

### 2.1 Relief Request MC-GRV-01

The licensee requests relief from the minimum elapsed time requirements of OM-1 paragraphs 8.1.2.8 and 8.1.3.7 for all safety and relief valves tested under ambient conditions using a test medium at ambient conditions.

#### 2.1.1 Licensee's Basis for Requesting Relief

The licensee states:

"This is a generic request for relief for safety and relief valves in compressible fluid service (other than steam) and liquid service applications, tested under ambient conditions using a test medium at ambient conditions. For these valves, the requirement for verifying temperature stability (by waiting 10 minutes between successive openings) is inappropriate and of no value. There is negligible effect on valve setpoint due to minor temperature deviations that might occur at these ambient conditions.

"The net result of having to wait 10 minutes between successive openings is an increase in manpower and time to perform the tests and an increase in radiation exposure when located in radiation areas, without a commensurate increase in test accuracy.

"Note: This issue has been identified by the ASME Code Committees along with safety and relief valve industry experts and is reflected in a change made to the 1995 version of the code (Appendix I). In addition, NUREG-1482, 4.3.9 (6) states "Thermal equilibrium need not be verified for liquid service valves tested at ambient temperature using a test medium (at ambient) temperature."

#### 2.1.2 Alternative Testing

The licensee proposes:

"For safety and relief valves tested under ambient conditions using test medium at ambient conditions, the 10 minutes hold requirements between successive openings will be deleted."

#### 2.1.3 Evaluation

The safety and relief valves function to provide over-pressure protection to their associated systems. The Code, OM-1 paragraphs 8.1.2.8 and 8.1.3.7, requires that a minimum of 10 minutes elapse between successive valve openings. The licensee proposes to delete the 10-minute hold time requirement for valves tested under ambient conditions using a test medium at ambient conditions.

The purpose of the hold time requirement between successive openings is to allow time for the valve to return to thermal equilibrium. This is not necessary for valves which are tested under ambient conditions using a test medium at ambient conditions since only minor temperature deviations occur during testing. This is reflected in modifications made to the 1995 Edition of the OM Code, Appendix I, paragraphs I 8.1.2(d) and I 8.1.3(d). The Code no longer requires verification of thermal equilibrium for valves which are tested at ambient temperature using a test medium at ambient temperature.

The licensee's alternative meets the requirements the 1995 OM Code, Appendix I, paragraphs I 8.1.2(d) and I 8.1.3(d) which has been incorporated by reference into 10 CFR 50.55a (64FR 51370).

#### 2.1.4 Conclusion

The proposed alternative to the requirements of OM-1 paragraphs 8.1.2.8 and 8.1.3.7 is approved pursuant to 10 CFR 50.55a(f)(4)(iv). This alternative meets the requirements of the 1995 OM Code, Appendix I, paragraphs I 8.1.2(d) and I 8.1.3(d) which has been incorporated by reference into 10 CFR 50.55a (64FR 51370). Therefore, the staff approves Relief Request MC-GRV-01.

### 2.2 Relief Request MC-GRV-02

The licensee requests relief from the minimum elapsed time requirements of OM-1, paragraphs 8.1.1.8, 8.1.2.8, and 8.1.3.7 for all safety and relief valves which are tested at other than ambient conditions. The licensee proposes a five minute hold time between successive valve openings instead of the Code-required 10-minute hold time.

#### 2.2.1 Licensee's Basis for Requesting Relief

The licensee states:

"This is a generic request for relief for all safety and relief valves. The 1995 version of the code, Appendix I has adopted a five minute hold time for steam, compressible fluid, and water service applications rather than the 10 minute hold time. This change was based on actual test data that revealed insignificant effect on valve setpoint by reducing the hold time between successive openings to five minutes."

#### 2.2.2 Alternative Testing

The licensee proposes:

"For safety and relief valves tested at other than ambient conditions, a five minute hold time will be used between successive valve openings."

#### 2.2.3 Evaluation

The safety and relief valves function to provide over-pressure protection to their associated systems. The Code, OM-1 paragraphs 8.1.1.8, 8.1.2.8, and 8.1.3.7, requires that a minimum of

10 minutes elapse between successive valve openings. The licensee proposes an alternative test method in which five minutes elapse between successive valve openings.

Modifications were made to the hold time requirements in the 1998 Edition of the OM Code, Appendix I, paragraphs I-8110(h), I-8120(h), and I-8130(g). The minimum elapsed time between successive valve openings was shortened from 10 to five minutes. This change was based on the insignificant effect of reducing the hold time on valve setpoint.

The licensee's alternative test method is consistent with the 1998 Code requirements and will provide an acceptable level of quality and safety. The staff finds this method acceptable in that it offers equivalent protection as provided by OM-1 paragraphs 8.1.1.8, 8.1.2.8, and 8.1.3.7.

#### 2.2.4 Conclusion

The proposed alternative to the minimum elapsed time requirements of OM-1 paragraphs 8.1.1.8, 8.1.2.8, and 8.1.3.7 for all safety and relief valves which are tested at other than ambient conditions is authorized pursuant to 10 CFR 50.55a(a)(3)(i). The licensee's alternative test method is consistent with the 1998 Code requirements and will provide an acceptable level of quality and safety. Therefore, the staff authorizes Relief Request MC-GRV-02.

#### 2.3 Relief Request MC-GRV-03

The licensee requests relief from the temperature stability requirements of OM-1 paragraphs 8.1.2.4 and 8.1.3.4 for all safety and relief valves which are tested under ambient conditions using a test medium at ambient conditions.

##### 2.3.1 Licensee's Basis for Requesting Relief

The licensee states:

"This is a generic request for relief for safety and relief valves tested under ambient conditions using a test medium at ambient conditions. For these valves, the requirements for verifying temperature stability (by ensuring no change in measured temperature of more than 10 °F in 30 minutes) is inappropriate and needlessly adds time to the test activity. Since the valves will be tested at ambient conditions, no temperature differential exists and the valves would already be considered stable per the test requirement above. There is negligible effect on valve setpoint associated with any minor temperature deviations at these ambient conditions.

"Note: This issue has been identified by the ASME Code Committees along with safety and relief valve industry experts and is reflected in a change made to the 1995 version of the code, Appendix I, ("Verification of thermal equilibrium is not required for valves which are tested at ambient temperature using a test medium at ambient temperature")."

### 2.3.2 Alternative Testing

The licensee proposes:

“For safety and relief valves tested under ambient conditions using test medium at ambient conditions, the Temperature Stability requirements of OM-1, 1987 Sections 8.1.2.4 and 8.1.3.4 will be replaced by the Thermal Equilibrium requirements in the 1995 edition of the code.”

### 2.3.3 Evaluation

The safety and relief valves function to provide over-pressure protection to their associated systems. The Code, OM-1 paragraphs 8.1.2.4 and 8.1.3.4, requires that temperature stability be achieved prior to starting set pressure testing. It states that the test method will be such that the temperature of the valve body will be known and stabilized before commencing set pressure testing, with no change in measured temperature of more than 10 °F in 30 minutes. The licensee proposes to replace the temperature stability requirements with the thermal equilibrium requirements of the 1995 Edition of the OM Code.

Changes made in the 1995 Edition of the Code, Appendix I, paragraphs I 8.1.2(d) and I 8.1.3(d) no longer require verification of thermal equilibrium for valves which are tested at ambient temperatures using a test medium at ambient temperatures. Under these conditions, there is not a significant difference in temperature between the valves and the surroundings and so the temperature of the valve body is stable.

The licensee's alternative meets the requirements of the 1995 Code, Appendix I, paragraphs I 8.1.2(d) and I 8.1.3(d) and which has been incorporated by reference into 10 CFR 50.55a (64 FR 51370).

### 2.3.4 Conclusion

The proposed alternative to the requirements of OM-1 paragraphs 8.1.2.4 and 8.1.3.4 is approved pursuant to 10 CFR 50.55a(f)(4)(iv). This alternative meets the requirements of the 1995 OM Code, Appendix I, paragraphs I 8.1.2(d) and I 8.1.3(d) which has been incorporated by reference into 10 CFR 50.55a (64 FR 51370). Therefore, the staff approves Relief Request MC-GRV-03.

## 3.0 CONCLUSION

The proposed alternatives to the Code requirements described in MC-GRV-01 and MC-GRV-03 are approved pursuant to 10 CFR 50.55a(f)(4)(iv).

The proposed alternative to the Code requirements described in MC-GRV-02 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety. The alternative is authorized for the second 10-year interval.

Principal Reviewer: M. Kotzalas

Date: February 3, 2000



McGuire Nuclear Station

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