May 19, 2000

Mr. Gary R. Peterson
Site Vice President
Catawba Nuclear Station
Duke Energy Corporation
4800 Concord Road
York, South Carolina 29745-9635

SUBJECT: CATAWBA NUCLEAR STATION, UNITS 1 AND 2 - RE: RELIEF REQUESTS FOR THE PUMP AND VALVE INSERVICE TESTING PROGRAM (TAC NOS. MA7314 AND MA7315)

Dear Mr. Peterson:

By letters dated August 17 and December 1, 1999, you submitted Revision 25 of the Inservice Testing (IST) Program for Catawba Nuclear Station, Units 1 and 2, and requested approval of three new relief requests (CN-GRV-01, -02, and -03) for valves.

We have completed our evaluation of these relief requests. Our safety evaluation is enclosed. We have not reviewed in detail the changes in the scope of the IST program, cold shutdown justifications, refueling outage justifications, and IST program commitments; they are subject to NRC inspection.

The proposed alternatives described in relief requests CN-GRV-01 and -03 are approved pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(f)(4)(iv) because they meet the requirements of the 1995 Edition of the American National Standards Institute/American Society of Mechanical Engineers Operations and Maintenance (OM) Code which has been incorporated by reference into 10 CFR 50.55a (64 FR 51370). The proposed alternative described in relief request CN-GRV-02 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) because the proposed testing provides an acceptable level of quality and safety. The above alternatives are approved or authorized, as applicable, for the second 10-year interval.

Sincerely,

/RA/

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

Docket Nos. 50-413 and 50-414

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO INSERVICE TESTING PROGRAM RELIEF REQUESTS FOR

DUKE ENERGY CORPORATION

CATAWBA NUCLEAR STATION, UNITS 1 AND 2

DOCKET NUMBERS 50-413 AND 50-414

1.0 INTRODUCTION

Title 10 of the *Code of Federal Regulations*, Section 50.55a (10 CFR 50.55a), requires that in-service 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 increases 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. Guidance related to the development and implementation of IST programs is given in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," issued April 3, 1989, and Supplement 1 issued on April 4, 1995. Also see NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," and NUREG/CR-6396, "Examples, Clarifications, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements."

The 1989 Edition of the ASME Code is the latest edition incorporated by reference in paragraph (b) of Section 50.55a. Subsection IWV of the 1989 Edition, which gives the requirements for IST of valves, references Part 10 of the American National Standards Institute/ASME *Operations and Maintenance Standards* (OM-10) as the rules for IST of valves. OM-10 replaces specific requirements in previous editions of Section XI, Subsection IWV, of the ASME Code. Subsection IWP of the1989 Edition, which gives the requirements for IST of pumps, references Part 6 of the American National Standards Institute/ASME *Operations and Maintenance Standards* (OM-6) as the rules for IST of pumps. OM-6 replaces specific requirements in previous editions of Section XI, Subsection IWP, of the ASME Code.

By letters dated August 17 and December 1, 1999, Duke Energy Corporation (DEC) submitted Revision 25 of its IST Program for Catawba Nuclear Station (CNS), Units 1 and 2, and

requested approval of three relief requests (CN-GRV-01, -02, and -03) for valves. The NRC's findings for these relief requests are given below.

2.0 RELIEF REQUESTS

2.1 Relief Request CN-GRV-01

The licensee requested 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 (SRVs) that are tested at 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 proposed:

> For safety and relief valves tested under ambient conditions using test medium at ambient conditions, the 10-minute hold requirement between successive openings will be deleted.

2.1.3 Evaluation

The SRVs function to provide over-pressure protection to their associated systems. The Code (Paragraphs 8.1.2.8, and 8.1.3.7 of OM-1) 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 that are tested under ambient conditions using a test medium at ambient conditions since only minor temperature deviations occur during testing. Therefore, the staff determined that deleting the hold time requirement between successive valve openings is acceptable.

Modifications were made to the 1995 Edition of the OM Code such that Paragraphs I-8.1.2(d) and I-8.1.3(d) no longer require verification of thermal equilibrium for valves that are tested at ambient temperature using a test medium at ambient temperature. The staff has reviewed these provisions of the 1995 Edition of the Code and found them to be acceptable. The licensee's proposed alternative is consistent with the 1995 Edition of the OM Code, 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).

2.1.4 Conclusion

The proposed alternative to the minimum elapsed time requirements of OM-1, Paragraphs 8.1.2.8, and 8.1.3.7, for all SRVs that are tested at ambient conditions using a test medium at ambient conditions is approved pursuant to 10 CFR 50.55a(f)(4)(iv). The proposed alternative meets the requirements of the 1995 Edition of the OM Code, 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 CN-GRV-01.

2.2 Relief Request CN-GRV-02

The licensee requested 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 SRVs which are tested at other than ambient conditions.

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 5 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 an insignificant effect on valve setpoint by reducing the hold time between successive openings to 5 minutes.

2.2.2 Alternative Testing

The licensee proposes:

> For safety and relief valves tested at other than ambient conditions, a 5-minute hold time will be used between successive valve openings.

2.2.3 Evaluation

The SRVs function to provide over pressure protection to their associated systems. The Code (Paragraphs 8.1.1.8, 8.1.2.8, and 8.1.3.7 of OM-1) requires that a minimum of 10 minutes elapse between successive valve openings. The licensee proposes an alternative test method in which 5 minutes elapse between successive valve openings.

Test data has shown that reducing the hold time requirements has had an insignificant effect on the setpoint of valves. Therefore, the staff has determined that the licensee's proposed alternative test method will provide an acceptable level of quality and safety.

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 5 minutes. The licensee's alternative is consistent with this provision of the 1998 Edition of the OM Code. However, authorization of the licensee's proposed alternative does not imply staff endorsement of the 1998 Edition of the Code.

The licensee's alternative test method 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 SRVs that 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. The staff concludes that it will provide an acceptable level of quality and safety. Therefore, the staff authorizes Relief Request CN-GRV-02.

2.3 Relief Request CN-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 SRVs that 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 all safety and relief valves tested under ambient conditions using a test medium at ambient conditions. For these valves, the requirement 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 at 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 SRVs function to provide over pressure protection to their associated systems. The Code (Paragraphs 8.1.2.4 and 8.1.3.4 of OM-1) 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 requires verification of thermal equilibrium for valves that are tested at ambient temperatures using a test medium at ambient temperatures. Under these conditions, there is no significant difference in temperature between the valves and the surroundings and, therefore, the temperature of the valve body is stable. Therefore, the staff has determined that these provisions of the1995 Edition of the OM Code are acceptable.

2.3.4 Conclusion

The proposed alternative to the temperature stability requirements of OM-1, Paragraphs 8.1.2.4 and 8.1.3.4 for all SRVs that are tested under ambient conditions using a test medium at ambient conditions is approved pursuant to 10 CFR 50.55a(f)(4)(iv). The proposed alternative method meets the requirements of the 1995 Edition of the 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 CN-GRV-03.

3.0 CONCLUSION

The proposed alternatives described in the relief requests CN-GRV-01 and -03 are approved pursuant to 10 CFR 50.55a(f)(4)(iv), because they are consistent with the provisions of the 1995 Edition of the OM Code which has been incorporated by reference into 10 CFR 50.55a

(64 FR 51370). The proposed alternative described in relief request CN-GRV-02 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the proposed testing provides an acceptable level of quality and safety.

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Date: May 19, 2000

Catawba Nuclear Station

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