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

January 17, 2017

Mr. Steven D. Capps
Vice President
McGuire Nuclear Station
Duke Energy Carolinas, LLC
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION, UNIT 2 – RELIEF REQUEST MC-SRV-NC-02, ALTERNATE TESTING FOR PRESSURIZER POWER OPERATED RELIEF VALVE BLOCK VALVE 2NC-31B (CAC NO. MF8909)

Dear Mr. Capps:

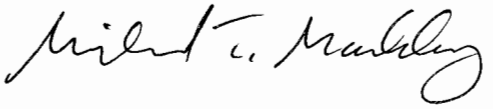
By letter dated December 1, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16349A620), Duke Energy Carolinas, LLC (Duke Energy, the licensee) submitted a Relief Request MC-SRV-NC-02 to the Nuclear Regulatory Commission (NRC) for certain American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power* Plants (OM Code) requirements at McGuire Nuclear Station (MNS), Unit 2. The licensee requested an alternative test plan in lieu of certain inservice testing (IST) requirements of the 2004 Edition through 2006 Addenda of the ASME OM Code for the IST program at MNS, Unit 2 during the fourth 10-year IST program interval for Pressurizer Power Operating Valve (PORV) Block Valve 2NC-31B. Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), the licensee requested to use an alternative on the basis that complying with the specified requirement would result in hardship or unusual difficulty.

The NRC staff determined that the proposed alternative provides reasonable assurance that valve 2NC-31B is operationally ready, and that compliance with the ASME OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(z)(2). Therefore, the NRC staff authorizes the MNS, Unit 2 proposed alternative request until valve 2NC-31B is repaired during the next refueling outage which is currently scheduled to begin on March 30, 2017.

All other ASME OM Code requirements for which relief was not specifically requested and authorized by the NRC remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact the Project Manager, Michael Mahoney at 301-415-3867 or via e-mail at Michael.Mahoney@nrc.gov.

Sincerely,



Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-370

Enclosure:
Safety Evaluation

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ALTERNATIVE REQUEST MC-SRV-NC-02 RELATED TO THE

INSERVICE TESTING PROGRAM FOURTH 10-YEAR INTERVAL

DUKE ENERGY CAROLINAS, LLC

MCGUIRE NUCLEAR STATION, UNIT 2

DOCKET NUMBER 50-370

1.0 INTRODUCTION

By letter dated December 1, 2016, Agencywide Documents Access and Management System (ADAMS) Accession No. ML16349A620, Duke Energy Carolinas, LLC (Duke Energy, the licensee) submitted Relief Request MC-SRV-NC-02 to the Nuclear Regulatory Commission (NRC or Commission) requesting alternatives to certain American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code) requirements at McGuire Nuclear Station (MNS), Unit 2. The licensee requested an alternative test plan in lieu of certain inservice testing (IST) requirements of the 2004 Edition through 2006 Addenda of the ASME OM Code for the IST program at MNS, Unit 2 during the fourth 10-year IST program interval. The requested alternative is related to testing for Pressurizer Power Operating Valve (PORV) Block Valve 2NC-31B.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.55a(z)(2), the licensee requested to use proposed alternatives since complying with the current ASME OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(f), "Inservice Testing Requirements," require, in part, that IST of certain ASME Code Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized pursuant to paragraphs 10 CFR 50.55a(z)(1) or 10 CFR 50.55a(z)(2).

In proposing alternatives, a licensee must demonstrate that the proposed alternatives provide an acceptable level of quality and safety (10 CFR 50.55a(z)(1)) or compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety (10 CFR 50.55a(z)(2)).

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request and the Commission to authorize the alternative requested by the licensee.

3.0 TECHNICAL EVALUATION

3.1.1 Licensee's Alternative Request MC-SRV-NC-02

ASME OM Code Requirements:

ISTC-3510 "Exercising Test Frequency", states in part "Active Category A, Category B, and Category C check valves shall be exercised nominally every 3 months, except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3570, ISTC-5221, and ISTC-5222."

Alternative testing is requested for the following valve:

Table 1

Valve ID	System	Cat	Class
2NC-31B	Pressurizer Block Valve	B	1

In its letter dated December 1, 2016, the licensee states the following:

Reason for Request

Nuclear Condition Report (NCR) 02074676 was initiated by systems engineering on October 31, 2016. The NCR identifies an increase in Unit 2 Reactor Coolant System (RCS) identified leakage on October 29 and 30, 2016, as compared to previous values. The October 29 and 30, 2016 identified leakage calculation values were 0.057 and 0.064 GPM, respectively, an increase from typical RCS identified leakage values of 0.01 to 0.02 GPM. Technical Specification (TS) 3.4.13 limits identified RCS leakage to a maximum of 10 GPM.

2NC-31B was stroked for routine surveillance on October 15, 2016. Following successful completion of this surveillance, RCS identified leakage slowly increased and was monitored by engineering until systems engineering generated the NCR for an adverse change in RCS identified leakage. Since a slow change in RCS identified leakage trending was present following 2NC-31B surveillance testing, this particular valve was suspected to be the source of leakage. Following surveillance testing, the valve was returned to its normally open position and remained in that configuration for the duration of the trending period.

Based on suspected leakage, Work Order (WO) 20121091 was generated for troubleshooting valve 2NC-31B. Troubleshooting efforts included station personnel making a pressurizer cavity entry on November 3, 2016, to compare valve packing leak off line temperatures between 2NC-31B and similar parallel PORV Block Valves. The as-found 2NC-31B packing leak off line temperature was approximately 296°F as compared to similar valves at 183°F and 141°F. After the as-found data was obtained, 2NC-31B was manually placed on backseat to isolate the packing area. Following a hold

period, 2NC-31B as-left valve packing leak off temperature was reported to have decreased. Valve stroke timing of 2NC-31B from the backseat position (both directions) was performed with no notable change in stroke time. 2NC-31B was left in the open backseat position with power available. Note that the current positions of parallel PORV block valves 2NC-33A and 2NC-35B are open on backseat and closed, respectively, with power available for both valves.

Subsequent RCS identified leakage calculations have proven that placing 2NC-31B on backseat reduced Unit 2 RCS identified leakage to approximately 0.01 GPM, consistent with trends prior to the last 2NC-31B surveillance test. Stroking 2NC-31B could result in further packing leakage and a reduction of RCS operational leakage margin. Also, restoration after testing requires personnel entry into the pressurizer enclosure and application of the 6-hour completion time of TS 3.6.14 Condition D for removal of the enclosure hatch. Current RCS leakage values are stable with 2NC-31B open on backseat. 2NC-31B remains operable with emergency power available. Based on current plant conditions and as described in the proposed alternative basis, the licensee is requesting relief from ASME Code quarterly valve surveillances to prevent quarterly valve cycles until valve repairs can be made during the next Unit 2 refueling outage.

Repair of 2NC-31B would require entry into containment and RCS depressurization for isolation purposes. Personal safety and ALARA practices are maximized during a scheduled refueling outage. Additionally, maneuvering the reactor to a mode outside of Technical Specification applicability and depressurizing the RCS involves inherent risk and increases nuclear safety risk due to cycling plant equipment.

Proposed Alternative and Basis for Use

As an alternative to performing quarterly surveillance testing on 2NC-31B, the licensee is requesting to perform exercise and valve stroke timing testing following valve repair. [2NC-31B repair is planned for the next McGuire Unit 2 refueling outage 2EOC24, which is scheduled to begin on March 30, 2017]. In the event of PORV block valve packing leakage, stroking the respective valve creates a hardship because of the increased potential for packing leakage. Increased leakage reduces the margin for acceptable reactor coolant system identified leakage (Reference Technical Specification 3.4.13, Operational Leakage). If RCS identified leakage exceeds its allowable limit, the required action is plant shutdown.

As stated [above], to control stem packing leakage on 2NC-31B, the licensee manually positioned the valve open on backseat with power available. 2NC-31B is administratively controlled in this position. If required to be closed to perform its intended safety function, the valve is closed by a control room operator. Operational valve stroke timing testing was conducted from the open backseat configuration and re-opened the valve with satisfactory results. This testing demonstrates the valve is fully operationally ready in the current configuration. Continued stroking of 2NC-31B represents a hardship with respect to manually re-positioning the valve on backseat following each quarterly exercise and valve stroke timing test. Stroking the valve with a packing leak during normal plant operation may cause further stem packing damage, resulting in increased RCS leakage.

2NC-31B has established preventative maintenance activities. The valve has maintained consistent performance with no adverse trends or abnormalities noted during motor operated valve diagnostic testing. The valve actuator general and lubrication condition is of sufficient quality to support continued reliability with the relief of quarterly exercise and stroke timing activities until scheduled repairs.

In-Service Testing performance history of McGuire Unit 1 and Unit 2 PORV block valves has been excellent with no valve stroke timing or position indication testing failures from January 1, 2009, to present. 2NC-31B valve stroke timing performance (open and closed directions) has been consistently between 5.8 and 6.5 seconds, demonstrating acceptable margin to the maximum limit of 10 seconds.

Duration of the Proposed Alternative

This condition is only intended to permit McGuire Unit 2 operation for a limited period of time not to exceed restart from the next refueling outage, 2EOC24. Following the refueling outage, the licensee will resume quarterly testing of 2NC-31B per applicable ASME Code requirements.

3.1.2 NRC Staff Evaluation

ASME OM Code requirement ISTC-3510 requires that active Category A and B valves be exercised nominally every three months. In addition, the ASME OM Code specifies that if the exercise tests are not practicable to perform during power operation the test may be deferred to either cold shutdowns or refueling outages.

The licensee had been exercise testing PORV Block Valve 2NC-31B nominally every three months. IST performance history has been excellent with no issues. Recently, there has been a noted increase in reactor coolant system (RCS) leakage due to faulty packing of the PORV Block Valve 2NC-31B. Continued operation in the normally open position would challenge technical specification (TS) RCS leakage acceptance criteria. To avoid an unnecessary RCS depressurization, PORV Block Valve 2NC-31B was back-seated in the open position to seal off the packing area, operationally tested from this configuration, and re-seated into the open back seat position. RCS leakage was confirmed to return to acceptable levels. Continuation with the quarterly exercise stroke testing could result in an increase in packing degradation and lead to an unnecessary plant shutdown. This represents a hardship or unusual difficulty without a compensating increase in the level of quality or safety.

The licensee proposes to maintain the valve current configuration with PORV Block Valve 2NC-31B in the normally open and back seated position with power on and capable of isolating on a manual close signal. This configuration will be maintained until maintenance can be performed at the next refueling outage currently scheduled to begin on March 30, 2017. The NRC staff concludes that the proposed alternative provides reasonable assurance that the components are operationally ready.

The NRC approved a similar relief request for the Unit 2, PORV Block Valve 2NC-35B on October 20, 2016 (ADAMS Accession No. ML16291A303).

4.0 CONCLUSION

The NRC staff has concluded that the proposed alternative provides reasonable assurance that PORV Block Valve 2NC-31B is operationally ready, and that compliance with the ASME OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(z)(2).

Therefore, the NRC staff authorizes Relief Request MC-SRV-NC-02 for MNS, Unit 2, proposed alternative request until PORV Block Valve 2NC-31B is repaired during the next refueling outage which is currently scheduled to begin on March 30, 2017.

All other ASME OM Code requirements for which relief was not specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: M. Farnan, NRR

Date: January 17, 2017

If you have any questions, please contact the Project Manager, Michael Mahoney at 301-415-3867 or via e-mail at Michael.Mahoney@nrc.gov.

Sincerely,

/RA/

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-370

Enclosure:
Safety Evaluation

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ADAMS Accession No. ML16358A696 *Via Memorandum

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