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

February 22, 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 1 - RELIEF REQUEST 16-MN-002, ALTERNATIVE TO DEFECT REMOVAL PRIOR TO PERFORMING REPAIR ACTIVITIES ON NUCLEAR SERVICE WATER SYSTEM PIPING (CAC NO. MF8052)

Dear Mr. Capps:

By letter dated June 23, 2016, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16180A177), as supplemented by letter dated October 13, 2016 (ADAMS Accession No. ML16294A254), Duke Energy Carolinas, LLC (Duke Energy, the licensee) submitted Relief Request (RR) 16-MN-002 for use of an alternative to certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, IWA-4400 requirements, at McGuire Nuclear Station (MNS), Unit 1. Specifically, RR 16-MN-002 provides an alternative for the repair of degraded Nuclear Service Water System piping.

The U.S. Nuclear Regulatory Commission (NRC) staff has concluded that the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the subject piping and that complying with the specified ASME 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(z)(2). Therefore, the NRC staff authorizes the use of RR 16-MN-002 for the remainder of the fourth 10-year inservice inspection (ISI) interval, which is scheduled to end on November 11, 2021, at MNS, Unit 1. The NRC staff concludes that any encapsulation installed in accordance with the proposed alternative and is not degraded, is authorized to remain in service for the duration of the design life of the encapsulation.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request 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. 50-369

Enclosure:
Safety Evaluation

cc w/encl: Distribution via ListServ

UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST 16-MN-002

ALTERNATE REPAIR FOR NUCLEAR SERVICE WATER PIPING

MCGUIRE NUCLEAR STATION, UNIT 1

DUKE ENERGY CAROLINAS, LLC.

DOCKET NO. 50-369

1.0 INTRODUCTION

By letter to the U. S. Nuclear Regulatory Commission (NRC, Commission) dated June 23, 2016 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML16180A177), as supplemented by letter dated October 13, 2016 (ADAMS Accession No. ML16294A254), Duke Energy Carolina, LLC (Duke Energy, the licensee) submitted Relief Request (RR) 16-MN-002 for use of an alternative to certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, IWA-4400 requirements, at McGuire Nuclear Station (MNS), Unit 1.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (CFR) 50.55a(z)(2), the licensee requested to use the alternative in RR 16-MN-002 on the basis that compliance with the specified ASME requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. RR 16-MN-002 is a contingency plan that provides an alternative for the repair of degraded Nuclear Service Water (RN) System piping.

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(g)(4) state, in part, that ASME Code Class 1, 2, and 3, components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components."

The regulations in 10 CFR 50.55a(z) state, in part, that alternatives to the requirements of 10 CFR 50.55a(g) may be used, when authorized by the Commission, if a licensee demonstrates (1) the proposed alternatives would provide an acceptable level of quality and safety or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

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 NRC staff to authorize the alternative proposed by the licensee.

3.0 TECHNICAL EVALUATION

3.1 ASME Code Component(s) Affected

The affected RN System ASME Class 3 components are listed below:

- 36-inch (in) and 42-in diameter buried and underground supply piping from valve 1RN-1 at the Low Level Intake (LLI) at Cowans Ford Dam to the Auxiliary Building, and supply piping from the Auxiliary Building wall to isolation valves 0RN-010AC, 0RN-012AC, and 0RN-301AC in the Auxiliary Building. This piping contains raw water from Lake Norman.

- 30-in and 36-in diameter buried and underground supply and return piping from the Standby Nuclear Service Water Pond (SNSWP) to the Auxiliary Building, and supply and return piping from the Auxiliary Building wall to isolation valves 0RN-07A, 0RN-09B, 0RN-0149A, and 0RN-152B in the Auxiliary Building. This piping contains raw water drawn from, and returned to, the SNSWP.

The nominal wall thickness of the subject carbon steel piping is 0.5 in. The design pressure is 25 to 35 pounds per square inch gauge (psig) and design temperature is 95 to 150 degrees Fahrenheit (°F). The subject piping does not have an internal coating system, but the exterior of this piping was coated with coal tar epoxy.

3.2 Applicable Code Edition and Addenda

The code of record for the current fourth 10-year ISI interval is the ASME Code, Section XI, 2007 Edition with the 2008 Addenda.

The construction code is American National Standards Institute (ANSI) B31.7 Class III, 1969 Edition including Addenda a, b, & c. However, Duke Energy Specification MCS-1206.00-02-0002, "Specification for the Design Of Power Piping Systems Materials And Components, QA Conditions 1, 2, 3, & 4" specifies that repairs, replacements and modifications performed under the ASME Code, Section XI, shall be made in accordance with the ASME Code, Section III, Subsection ND, 1971 Edition with Winter 71 Addenda.

3.3 Applicable Requirement

The ASME Code, Section XI, IWA-4400 specifies requirements for welding, brazing, metal removal, fabrication, and installation. IWA-4420 specifies requirements for defect removal, evaluation, and examination.

The licensee plans to continue to inspect portions of buried and underground RN System piping in accordance with requirements of the McGuire Buried Piping Integrity Program, during the MNS, Unit 1 fourth 10-year ISI interval. The licensee developed the McGuire Buried Piping Integrity Program to maintain the safe and reliable operation of all buried piping systems within its scope, including portions of the RN System. Subsequently, by letter dated November 3, 2010 (ADAMS Accession No. ML103090142), Nuclear Energy Institute (NEI) issued NEI 09-14,

Revision 0, "Guideline for the Management of Buried Piping Integrity," to facilitate the industry implementation of the initiative.

The licensee stated that if excessive wall thinning or through-wall leakage resulting from internal or external corrosion is detected during inspections of the subject piping, the defective areas would require repair in accordance with the ASME Code, Section XI, 2007 Edition with the 2008 Addenda, IWA-4000. Prior to performing repair/replacement activities by welding, the defective portions of the component must be removed in accordance with IWA-4420.

3.4 Proposed Alternative and Basis for Use

In lieu of the requirement of the ASME Code, Section XI, IWA-4400 to remove the defective portion of the component prior to performing repair/replacement activities by welding, the licensee proposed to install an encapsulation on the degraded area of the subject piping with the following requirements:

3.4.1 Limitations on Application

The proposed alternative shall not be used for defects caused by external corrosion, cracks or crack-like indications.

Encapsulation of a defective area shall be used only once at each discrete location.

3.4.2 Pre-Installation Examination

The licensee has monitored the interior and exterior surfaces of subject piping periodically since 1990. The licensee has inspected exterior portions of the buried 36-in and 42-in RN System piping and has found the pipe to be in good condition with no leaks or mechanical repairs being required.

In addition, the licensee has visually examined the interior of approximately 1,200 feet (ft) of pipe, and performed localized ultrasonic thickness measurements on the SNSWP piping. The licensee inspected the interior of only a small section of the LLI piping due to interferences with valve 1RN001.

Ultrasonic examinations shall be performed to characterize the defect and to confirm that the defect does not contain cracks or crack-like indications. Ultrasonic thickness examinations shall also be performed on all pipe exterior surfaces within an area whose diameter is at least twice that of the encapsulation to confirm the absence of any additional flaws that could adversely affect the design of the modification or integrity of the piping.

To repair a defective area resulting from external corrosion, all external surfaces of the piping within five feet on each side of the repair area shall be visually examined to confirm the absence of similar conditions requiring repair.

To repair a defective area resulting from internal corrosion, all external surfaces of the piping within five feet on each side of the repair area shall be examined ultrasonically using six inch grids. These examinations provide reasonable assurance that the structural integrity of the piping has not been challenged.

The licensee will address the cause of the defective conditions in accordance with its Corrective Action Program.

3.4.3 Design

The defective area shall be encapsulated on the outside diameter of the pipe using pressure retaining parts that comply with the Construction Code and Owner's Requirements. The diameter of the encapsulation shall not exceed 10-in nominal pipe size.

The spacing of adjacent encapsulations, if any, shall comply with Construction Code design limits. Specifically, the licensee stated that in order to minimize residual stresses on the wall of the base metal, the distance between the weld edges of any two adjacent encapsulations will not be less than $2.5\sqrt{(R\ t_{nom})}$, where R is the outer radius of the pipe being repaired and t_{nom} is the nominal thickness of the pipe being repaired.

The licensee stated that a stress analysis will be performed considering all loads, including seismic, to address the presence of the encapsulation, including its weight. The encapsulation location will also be shown on applicable plant drawings.

For corrosion initiated on the inside diameter and outside diameter of the pipe (with or without through-wall leakage), the repair shall be designed such that the inside diameter of the encapsulation is greater than the maximum diameter of the defective area plus twice the nominal thickness of the component. In addition, the nominal thickness of the encapsulation and its connecting weld to the pipe outside diameter surface shall be equal to, or greater than, the nominal wall thickness of the pipe.

For external general corrosion of the pipe wall that does not result in a through-wall defect, continued corrosion through the thickness of the pipe wall and laterally will be arrested by installing sealant into the encapsulation following pressure testing. This will inhibit continued external corrosion of the pipe wall, and protect the interior of the encapsulation from future corrosion. Application of protective coatings on the exterior surfaces of the pipe wall and the encapsulation will inhibit future corrosion of these surfaces.

In letter dated June 23, 2016, the licensee stated that for internal general corrosion of the pipe wall that does not result in through-wall leakage, the design of the encapsulation shall use 0.002 in/year (2 mils/year) for the through-wall and lateral rate of corrosion at the defective area. For internal pitting corrosion of the pipe wall, the design of the encapsulation shall use 0.004 in/year (4 mils/year) for the lateral rate of corrosion at the defective area. However, in letter dated October 13, 2016, the licensee stated that to be consistent with a prior relief request, RR 09-MN-002 dated December 14, 2010 (ADAMS Accession No. ML103560592), a lateral corrosion rate (in any single direction) of the defective area of not less than 0.008 in/year (8 mils/year) will be used in all encapsulation designs.

The proposed alternative will not be applicable to any 20-foot length of the subject pipe containing more than 10 encapsulations of any size.

3.4.4 Installation

In its letter dated October 13, 2016, the licensee stated that welding will be performed in accordance with the ASME Code, Section XI, IWA-4400, which specifies requirements for

welding, brazing, metal removal, fabrication, and installation. Manual welding of encapsulations on water-backed piping will use the shielded metal arc welding process and low-hydrogen electrodes.

Weld surfaces shall be dry, allowing welds to be made in accordance with qualified welding procedures. In the event that the temporary plug is not capable of stopping leakage, additional actions shall be taken to ensure that the weld surfaces are dry. Such actions may include, but are not limited to, installation of a metal plug over the defective area using a seal weld. This plug and its seal weld would be completely encapsulated and would not be relied upon for the leak-tight or structural integrity of the modification.

The proposed alternative will use low-hardenability materials for the encapsulation because low-hardenability material will not likely cause weld-cracking as compared to high-hardenability material.

The licensee plans to use stringer beads to deposit the weld attaching the encapsulation to the pipe. The stringer bead technique is expected to produce tempering in the heat affected zone to achieve an acceptable microstructure in the weld. Therefore, the licensee stated that it does not need to use the temper bead welding technique.

After installation, pressure testing of the encapsulation shall be performed. Following pressure testing, sealant shall be injected into the encapsulation to inhibit corrosion. The pressure test port fitting in the encapsulation shall be seal-welded, and protective coatings shall be restored on exterior surfaces of the pipe and the encapsulation in the vicinity of the repair area.

3.4.5 Acceptance Examination

After a minimum period of 48 hours from completion of welding, a surface examination (e.g., magnetic particle or liquid penetrant) shall be performed on the weld connecting the encapsulation to the pipe.

3.4.6 Pressure Testing

The encapsulation shall be pressure tested upon completion of the repair to confirm the leak-tightness of the encapsulation and its connecting welds to the pipe wall. In the October 13, 2016 letter, the licensee stated that pressure testing of the encapsulation will be performed in accordance with the ASME Code, Section XI, IWA-4540(a) with a normal operation pressure in accordance with the requirements of IWD-5221. The test medium shall be water, and the minimum hold time shall be 10 minutes (as required by IWA-5213(b) for non-insulated components).

The licensee noted that the pipe will be under pressure during the repair. The pressure testing discussed herein is specifically for the encapsulation, not the pipe.

3.4.7 Inservice Examination

A visual examination shall be performed at least once during each ISI period for the duration of the design life of the repair to confirm the absence of leakage from piping locations where encapsulations have been installed. In letter dated October 13, 2016, the licensee explained that an inspection during every ISI period is sufficient based on the expected low system

corrosion rates. The licensee noted that a visual examination once each ISI period is consistent with visual examination requirements during system leakage testing of buried Class 3 components, as specified in IWA-5244(b)(1) and Table IWD-2500-1, Examination Category D-B, Item D2.10 in the 2013 Edition of ASME Code, Section XI.

The visual examination shall include ground surfaces above buried piping in the vicinity of each encapsulation, underground piping in the vicinity of each encapsulation, and each encapsulation installed on piping within the Auxiliary Building.

Leakage, if detected, shall be addressed through its Corrective Action Program.

3.5 Hardship Justification

The licensee noted that to repair the subject piping in accordance with the ASME Code requirements would require the RN System entering Technical Specification (TS) 3.7.7, Condition A, which has an allowable outage limit of 72 hours. The licensee stated that it would be difficult to complete such an ASME Code repair within 72 hours. The "A" train of the RN System in both units aligns to the LLI. If the ASME Code repair cannot be completed in the 72 hour outage time, the other unit may need to shutdown to continue the repair.

The licensee noted that for repair of excessive wall-thinning caused by external corrosion (without through-wall leakage), restoration of the required component wall-thickness could be performed by weld overlay on the exterior of the pipe in accordance with applicable ASME Code requirements. However, the integrity of the pressure boundary could be jeopardized by welding directly on these areas during system operation.

3.6 Duration of Proposed Alternative

The licensee requested the proposed alternative for the remainder of the fourth 10-year ISI interval, currently scheduled to end on November 30, 2021. The licensee further requested that use of any encapsulation installed in accordance with the proposed alternative is for the duration of the design life of the encapsulation.

4.0 NRC STAFF EVALUATION

The NRC staff evaluated the proposed alternative in terms of limitation of application, pre-installation evaluation, design, acceptance examination, pressure tests, inservice monitoring and hardship justification as follows.

4.1 Limitation of Application

The NRC staff concludes that the proposed alternative provides adequate limitation to prohibit the use of encapsulations on cracks, crack-like defects, or defects caused by external corrosion. This prohibition is acceptable because it is more difficult to predict the growth of cracks than that of general corrosion. The cracks may grow outside of encapsulation and renders the repair ineffective.

The proposed alternative prohibits the encapsulation to be used more than once at a specific defect area. This limitation is acceptable because if an encapsulation is installed at the same

degraded area more than once, it implies that the pipe has a fundamental corrosion issue that needs to be repaired by a method other than the proposed alternative.

4.2 Pre-Installation Evaluation

The NRC staff finds that the licensee has monitored the interior and exterior surfaces of subject piping periodically since 1990 and the inspected areas of the piping are in good condition. From the periodic inspections, the licensee has determined that the average general corrosion rate is 2 mils/year and the average pitting corrosion rate is 4 mils/year. The NRC staff concludes that these corrosion rates do not deviate significantly from the corrosion rates based on operating experience in the industry.

The NRC concludes that it is acceptable that the proposed alternative requires that the defect and surrounding area be examined prior to installing encapsulation. This will ensure that the encapsulation will be welded to a pipe area that has sufficient wall thickness to support welding and applied loads.

4.3 Design

In letter dated June 23, 2016, the licensee discussed the use of 2 mils/year for the through-wall and lateral rate of general corrosion and the use of 4 mils/year for the lateral rate of pitting corrosion at the defective area for the encapsulation design. However, as stated above, the licensee will use 8 mils/year for the lateral corrosion rate, in any single direction, of the defective area in all encapsulation designs. The NRC staff concludes that the use of a lateral corrosion rate of 8 mils/year in any single direction in the design of the encapsulation is more conservative and acceptable than the use of either 2 mils/year or 4 mils/year and, therefore, is acceptable.

As stated above, the proposed alternative limits the maximum allowable diameter of the encapsulation to be no more than 10 in. The NRC staff concludes that by limiting its size, the encapsulation would not generate excessive loads to affect the structural integrity of the subject piping.

The proposed alternative also requires that the minimum inside diameter of the encapsulation be the maximum diameter of the defective area plus twice the nominal wall thickness. This limitation is to ensure that the encapsulation will not be too small such that the defect may grow to outside of the encapsulation. Based on the low corrosion rate of 8 mils/year. The NRC staff concludes that the minimum inside diameter of the encapsulation is adequate to contain the potential degradation growth.

In the NRC staff's previous review of the similar relief request (RR 09-MN-002) for the third 10-year ISI interval in 2010, the NRC staff questioned the operability of the subject piping if the encapsulation fails in the future after the repair. By letter dated December 14, 2010 (ADAMS Accession No. ML103560592), the licensee stated that the RN System is designed to perform its safety function assuming a single failure and that a failure of the defect repair described in the request will result in leakage that will not compromise the function of the RN System. At the time, the NRC staff performed an independent calculation and estimated that the failure of the maximum-sized repair by the proposed alternative will allow less than 10 percent of flow to be lost, which is acceptable. The NRC staff concludes that the RN System would continue to fulfill its safety function even if the encapsulation fails.

The NRC staff notes that the RN System is of low operating pressure and temperature. Therefore, the applied loads on the pipe are not significant. The encapsulation design will have sufficient margin to support the applied loads transferred from the pipe to the encapsulation.

The NRC staff finds acceptable that the proposed alternative requires a distance of at least $2.5\sqrt{(R\ t_{nom})}$ inches between two adjacent encapsulations to reduce the residual stresses on the pipe and.

The NRC staff concludes that the proposed alternative limits any 20-foot length of subject pipe segment to have no more than 10 installed encapsulations is acceptable. This is to ensure that any pipe segment that contains too many encapsulations needs to be repaired by a method other than the proposed alternative.

4.4 <u>Installation</u>

The NRC staff notes that the proposed alternative requires that welding of the encapsulation to the subject piping will be performed in accordance with the ASME Code, Section XI, IWA-4400, and is, therefore, acceptable.

The NRC staff notes that the carbon steel pipe material and pipe wall thickness (0.5 in) does not require either weld preheating or post-weld heat treatment. However, the licensee will use stringer beads to deposit the weld attaching the encapsulation to the pipe. The stringer bead technique is expected to temper the heat affected zone to achieve an acceptable microstructure in the weld.

The NRC staff notes that the pipe wall being welded will be water-backed. Also, the exterior surface of the pipe at the defective area may be wet, if leakage occurs, which is not suitable for welding. Welding on water-backed pipe is not addressed in the ASME Code, Sections III or XI, and is an essential variable only for temper bead welding procedures, but could become an issue when the base material has high-hardenability. The NRC staff also notes that the subject piping is carbon steel which comprised of low-hardenability material which is less susceptible to production of a hard, brittle microstructure in the heat affected zone than high-hardenability material. The licensee proposed stringer bead weld technique will reduce the chance of cracking. Therefore, water-backed welding is not likely to be an issue in this case.

As for welding on the wet surface, the proposed alternative has provisions to require dryness on the repaired pipe surface prior to welding. The licensee will install a temporary plug or apply a metal plug and a seal weld to stop the leakage. Because any plug or seal weld will be completely encapsulated by the final repair, structural integrity and leak tightness of the pipe does not rely on the plug or seal weld. The NRC staff concludes that the provisions for ensuring a dry surface for welding are acceptable.

The NRC staff notes that the proposed alternative requires injecting sealant inside the encapsulation, plugging the pressure port, and applying coating to the encapsulation and surrounding area. The NRC staff concludes that these requirements are acceptable because the procedures will minimize future corrosion at the repaired location of the pipe.

4.5 Acceptance Examination

The NRC staff concludes that performing a surface examination 48 hours after welding is acceptable because it satisfies the requirements of the construction code.

4.6 Pressure Testing

The NRC staff finds that it is acceptable that the proposed alternative requires performance of a pressure test and associated VT-2 visual examination of the installed encapsulation in accordance with IWA-4540(a) and IWA-5000. The NRC staff concludes that the pressure test will verify leak-tightness of the repaired pipe.

4.7 Inservice Examination

The NRC staff finds that it is acceptable that the licensee will visually examine ground surfaces above buried piping in the vicinity of each encapsulation, underground piping in the vicinity of each encapsulation, and each encapsulation installed on piping within the Auxiliary Building.

The licensee stated that it will perform visual examination at least once during each ISI period in accordance with IWA-5244(b)(1) and Table IWD-2500-1, Examination Category D-B, Item D2.10, of the ASME Code, Section XI, 2013 Edition. The NRC staff notes that the Code of Record for the fourth 10-year ISI interval is the 2007 edition through 2008 addenda, not the 2013 edition of the ASME Code. However, the visual examination requirement in Table IWD-2500-1, Examination Category D-B, Item D2.10 in the 2007 edition is the same as in the 2013 edition. Therefore, the NRC staff concludes is it acceptable that the licensee uses the visual examination requirement in Table IWD-2500-1 of the 2013 edition.

The NRC staff has approved the flow balance testing and periodic visual examination of ground surfaces to confirm that the RN System of each unit is capable of supplying the design basis cooling water to various nuclear safety-related loads as discussed in an NRC letter to the licensee dated February 18, 2010 (ADAMS Accession No. ML100470359). The NRC staff concludes that the periodic flow balance testing is an acceptable additional verification of the structural integrity of the repaired pipe.

The NRC staff concludes that it is acceptable that the licensee will address leakage, if detected, through its Corrective Action Program.

4.8 Hardship Justification

The NRC staff determines that an ASME Code repair will take longer than the 72-hour allowed outage time as specified in MNS, Unit 1's TS 3.7.7, Condition A. If the ASME Code repair cannot be completed in the 72-hour time period, the other unit may need to shutdown to continue the ASME Code repair. The NRC staff concludes that a mid-cycle shutdown of one unit in order to perform an ASME Code-compliant repair on the sister unit is a hardship. In addition, the NRC staff concludes that performing the weld overlay on the exterior of the pipe in accordance with applicable ASME Code requirements may jeopardize the pipe by welding directly on the degraded areas of the piping during system operation. Therefore, the NRC staff concludes that the ASME Code-compliant repairs would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

4.9 Summary

The NRC staff concludes the proposed alternative provides reasonable assurance of the structural integrity and leak-tightness of the repaired subject pipe because the encapsulation will be installed based on adequate requirements for limitation of application, pre-installation evaluation, design, installation, acceptance examination, pressure testing, and inservice examination.

5.0 CONCLUSION

As set forth above, the NRC staff concludes that the proposed alternative provides reasonable assurance of structural integrity and leak-tightness of the subject piping and that complying with the specified ASME 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(z)(2). Therefore, the NRC staff authorizes the use of Relief Request 16-MN-002 for the remainder of the fourth 10-year ISI interval, which is scheduled to end on November 11, 2021, at MNS, Unit 1.

The NRC staff concludes that any encapsulation installed in accordance with the proposed alternative and is not degraded, is authorized to remain in service for the duration of the design life of the encapsulation.

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

Principal Contributor: JTsao, NRR

Date: February 22, 2017.

SUBJECT: MCGUIRE NUCLEAR STATION, UNIT 1 - RELIEF REQUEST 16-MN-002, ALTERNATIVE TO DEFECT REMOVAL PRIOR TO PERFORMING REPAIR ACTIVITIES ON NUCLEAR SERVICE WATER SYSTEM PIPING (CAC NO. MF8052)

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ADAMS Accession No. ML17034A362 *via memorandum

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