Southern Nuclear

Justin T. Wheat
Nuclear Licensing Manager

40 Inverness Center Parkway
Post Office Box 1295
Birmingham, AL 35242
205 992 5998 tel
205 992 7601 fax

jtwheat@southernco.com

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant Units 1&2
Joseph M. Farley Nuclear Plant Units 1&2
Vogtle Electric Generating Plant Units 1&2
Proposed Alternatives GEN-ISI-ALT-2017-01 Implementation of Code Case N-786-1 and GEN-ISI-ALT-2017-02 Implementation of Code Case N-789-1

Ladies and Gentlemen:

Pursuant to 10 CFR 50.55a(z)(2), Hardship without a Compensating Increase in Quality and Safety, Southern Nuclear Operating Company (SNC) hereby requests Nuclear Regulatory Commission (NRC) approval of Alternative GEN-ISI-ALT-2017-01 for the use of American Society of Mechanical Engineers (ASME) Code Case N-786-1, for Hatch Nuclear Plant (HNP) Units 1 and 2, Farley Nuclear Plant (FNP) Units 1 and 2, and Vogtle Electric Generating Plant (VEGP) Units 1 and 2. SNC also requests NRC approval of Alternative GEN-ISI-ALT-2017-02 for the use of ASME Code Case N-789-1, for HNP Units 1 and 2, and FNP Units 1 and 2.

Alternative GEN-ISI-ALT-2017-01, Code Case N-786-1 permits installation of technically sound, long term repairs in the form of full-structural Type B reinforcing sleeves for piping systems.

Alternative GEN-ISI-ALT-2017-02, Code Case N-789-1 permits temporary repair of degradation in Class 2 and 3 raw water piping systems.

To support work planning and preparation, SNC requests that the NRC approve the proposed alternatives by May 31, 2018.

This letter contains no NRC commitments. If you have any questions, please contact Ken McElroy at 205.992.7369.

Respectfully submitted,

Justin Wheat
Nuclear Licensing Manager

JTW/RMJ

Enclosures: 1. Proposed Alternative GEN-ISI-ALT-2017-01, Version 1.0
2. Proposed Alternative GEN-ISI-ALT-2017-02, Version 1.0

cc: Regional Administrator, Region II
NRR Project Manager – Farley, Hatch, Vogtle 1 & 2
Senior Resident Inspector – Farley, Hatch, Vogtle 1 & 2
RType: Farley - CFA04.054; Hatch - CHA02.004; Vogtle - CVC7000

Edwin I. Hatch Nuclear Plant - Units 1 and 2
Joseph M. Farley Nuclear Plant - Units 1 and 2
Vogtle Electric Generating Plant - Units 1 and 2
Proposed Alternative GEN-ISI-ALT-2017-01 in Accordance with 10 CFR 50.55a(z)(2) to Utilize ASME Code Case N-786-1

Enclosure 1
Proposed Alternative GEN-ISI-ALT-2017-01, Version 1.0

10 CFR 50.55a Request No. GEN-ISI-ALT-2017-01
Implementation of Code Case N-786-1
Farley Nuclear Plant Units 1 and 2
Hatch Nuclear Plant Units 1 and 2
Vogtle Nuclear Plant Units 1 and 2
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Hardship without a Compensating Increase in Qualify and Safety

1. ASME Code Component(s) Affected

This ISI alternative applies to all ASME Class 2 and 3 carbon steel piping systems at Farley Nuclear Plant, Units 1 and 2 (Farley), Hatch Nuclear Plant, Units 1 and 2 (Hatch), and Vogtle Nuclear Plant, Units 1 and 2 (Vogtle) with less than or equal to 200°F (93°C) and less than or equal to 275 psig (1.9 MPa) for maximum operating conditions.

2. Requested Approval Date

Approval is requested by May 31, 2018.

3. Applicable Code Edition and Addenda

The following table identifies the ASME Section XI Code of Record for performing Inservice Inspection (ISI) activities at each applicable Southern Nuclear (SNC) site.

Plant	ISI Interval	ASME Section XI Edition/Addenda	Interval Start	Interval Scheduled End
Farley Nuclear Plant, Units 1 and 2	5	2007 Edition/2008 Addenda	12/01/2017	11/30/2027
Hatch Nuclear Plant, Units 1 and 2	5	2007 Edition/2008 Addenda	01/01/2016	12/31/2025
Vogtle Nuclear Plant, Units 1 and 2	4	2007 Edition/2008 Addenda	05/31/2017	05/30/2027

All three plants will have implemented the repair/replacement requirements of the 2007 Edition with the 2008 Addenda prior to the expected NRC-approval due date for this ISI Alternative.

4. Applicable Code Requirements

The Editions/Addenda of ASME Section XI for which the alternative is requested is the 2007 Edition with the 2008 Addenda. Subsection IWA-4000 of this Edition and Addenda provide requirements for welding, brazing, metal removal, and installation of repair/replacement activities.

5. Reason for Request

IWA-4000 requires replacement or internal weld repair of wall thinning conditions resulting from degradation to be in accordance with the Owner's Requirements and the original or later Construction Code. However, the repair and replacement provisions of IWA-4000 cannot always be utilized when degradation or leakage is identified during plant operations. Other approved alternative repair or evaluation methods are not always practicable because of reduced wall thickness and/or moisture issues.

One reason for this request is to permit installation of technically sound repairs to provide adequate time for evaluation, design, material procurement, planning, and scheduling of an appropriate permanent repair or replacement of the defective piping, considering the impact on system availability, maintenance rule applicability, and availability of the replacement materials. This would be addressed with either a Type A or partial-structural Type B reinforcing sleeve for one operating cycle.

The other reason is to permit installation of long-term repairs in the form of full-structural Type B reinforcing sleeves for locally degraded portions of piping systems. The design, construction, and inservice monitoring of such sleeves provide a technically sound equivalent replacement for the segment of piping that is encompassed, comparable to or exceeding the level of quality and safety associated with a permanent ASME Code repair or replacement.

In either case, without this repair option, compliance with the specified requirements of IWA-4000 could in some cases necessitate taking a system out of service, resulting in extended technical specification actions and higher risks associated with loss of safety system availability. In other cases, plant shutdown would be necessary, resulting in higher risks associated with an unnecessary plant transient and loss of safety system availability as compared to maintaining the plant online.

All other ASME Code Section XI requirements for which relief is not specifically requested will remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

6. Proposed Alternative and Basis for Use

Proposed Alternative

Pursuant to 10 CFR 50.55a(z)(2), SNC proposes to implement the requirements of Code Case N-786-1 for repair of degradation in Class 2 and 3 carbon steel piping systems with less than or equal to 200°F (93°C) and less than or equal to 275 psig (1.9 MPa) for maximum operating conditions, resulting from mechanisms such as localized erosion, corrosion, cavitation, or pitting, but excluding conditions involving any form of cracking. These types of defects are typically identified by small leaks in the piping system or by pre-emptive, non-Code required ultrasonic thickness measurements performed to monitor for degradation mechanisms.

Basis for Use

The alternative repair technique described in Code Case N-786-1 involves the application of either Type A or Type B full encirclement sleeve halves welded together with full penetration longitudinal seam welds to reinforce the structural integrity in the degraded

area. In the case of Type B reinforcing sleeves, the ends are also welded to the piping in order to restore or maintain pressure integrity. This repair technique will be used when it is determined that the repair method is suitable for the particular defect or degradation being resolved without flaw removal.

The Code Case requires that the cause of the degradation be determined, and that the extent and rate of degradation in the piping be evaluated to ensure there are no other unacceptable locations within the surrounding area that could affect the integrity of the repaired piping. Please note that the SNC procedure for Class 2 and 3 pressure boundary integrity challenges requires the site to perform an operability determination and functionality assessment as described in the SNC operability determination procedure, as well as in the applicable guideline procedures to address operability and to conclusively show that the component or the piping that contains the defect has adequate structural integrity and is, therefore, in a degraded but operable condition. The SNC operability determination procedure requires an extent of condition to be documented for the immediate determination of operability.

Any areas showing signs of degradation will be included in the Owner's plan for thickness monitoring of full-structural Type B reinforcing sleeves. The area of evaluation will be dependent on the degradation mechanism present, but will extend at least $0.75\sqrt{RT_{nom}}$ ("R" and "T_{nom}" are the radius and nominal thickness of the pipe, respectively) beyond the edge of any sleeve attachment weld, as required by the Code Case. If the cause of the degradation is not determined, the maximum permitted service life of any reinforcing sleeve will be the time until the next refueling outage.

"Full-structural Type B" means the sleeve and attachment welds alone maintain full capability to withstand structural (mechanical) and pressure loading for which the piping is presently designed without need for additional support or reinforcement, and without reliance on any of the piping that is encased by the sleeve. Type A and partial-structural Type B sleeves rely on the encased underlying piping to provide some structural (mechanical) and/or pressure retaining integrity.

Type B reinforcing sleeves may be applied to leaking systems by installing a gasket or sealant between the sleeve and the pipe as permitted by the Code Case, and then clamping the reinforcing sleeve halves to the piping prior to welding. If welding of any type of sleeve occurs on a wet surface, the maximum permitted life of the sleeve will be the time until the next refueling outage.

A baseline thickness examination will be performed for completed full-structural Type B reinforcing sleeves, attachment welds, and surrounding areas, followed by similar thickness monitoring at a minimum of every refueling outage after installation. Full-structural Type B sleeves shall be removed prior to infringing upon design minimum wall thickness.

Type A and partial-structural Type B reinforcing sleeves completely encompass the degraded areas, are designed to accommodate predicted maximum degradation, and must be removed no later than the next refueling outage. The Code Case requires that these temporary sleeves be visually monitored for evidence of leakage at least monthly. If the areas containing the sleeves are not accessible for direct observation, monitoring shall be accomplished by visual assessment of surrounding areas or ground surface areas above reinforcing sleeves on buried piping, or by monitoring of leakage collection systems, if available.

SNC implementation of Code Case N-786-1 will include the following additional restrictions and clarifications:

1) When gasket material is used in accordance with paragraph 4(b) of the Code Case (water-backed applications), SNC will also require removal of any residual moisture by heating prior to welding.

2) Regarding paragraph 8(c) and 8(c)(1) of the Code Case, SNC will implement the thickness monitoring inspections of full-structural Type B sleeves at every refueling outage, and will schedule more frequent thickness monitoring, when appropriate, based on degradation rates that are calculated using the reductions in thicknesses observed between scheduled thickness monitoring inspections.

3) Sections 1, 3, 5, and 6 of the Code Case specify that materials, design, installation, and examination of reinforcement sleeves shall be performed in accordance with the Construction Code or ASME Section III applicable to each SNC plant. As allowed by IWA-4200 and IWA-4411, later Editions and Addenda of the Construction Code or ASME Section III may be used provided any required reconciliations are performed. However, only Editions/Addenda of ASME Section III that have been approved by the NRC in 10 CFR 50.55a will be used.

4) SNC performs repair/replacement activities in accordance with a fleet-wide, standardized Repair/Replacement Program based on the 2007 Edition / 2008 Addenda of ASME Section XI. Therefore, this Edition/Addenda of ASME Section XI will be used by all plants whenever the Code Case refers to IWA-4000.

5) If a buried piping system carrying radioactive fluid is repaired using this alternative, SNC will monitor for radioactive fluid leakage in accordance with the standard plant monitoring practices for all buried piping containing radioactive fluids. SNC is committed to implementation of Nuclear Energy Institute (NEI) 07-07, "Industry Ground Water Protection Initiative - Final Guidance Document," dated August 2007, in addition to monitoring in accordance with ASME Code Case N-786-1.

Code Case N-786-1 includes requirements for incorporating actual measured or estimated corrosion rates in the design of all reinforcing sleeves. For all sleeves, the initial degradation rate selected for design shall be equal to or greater than two times the maximum rate observed at the location of the repair. If the degradation rate for that location is unknown, an initial degradation rate of four times the estimated maximum degradation rate for that or a similar system at the same plant site for the same degradation mechanism shall be applied. If both the degradation rate for that location and the cause of the degradation are not conclusively determined, an initial degradation rate of four times the maximum degradation rate observed for all degradation mechanisms for that system or a similar system at the same plant site shall be applied. In addition, the Code Case imposes compensatory measures to account for any uncertainties in the corrosion rates used, thus providing reasonable assurance that structural integrity and leakage integrity will be maintained. These measures include limiting the design life of Type A and partial-structural Type B sleeves to a maximum of one refueling cycle, and requiring on-going monitoring of full-structural Type B sleeves as follows:

- For full-structural Type B reinforcing sleeves including their partial penetration attachment welds and surrounding areas, the Code Case requires that a baseline thickness examination be performed followed by similar thickness monitoring

inspections at a minimum of every refueling outage for the life of the repair. More frequent thickness monitoring examinations will be scheduled if maximum degradation rates observed during these inspections indicate that the design thickness required by the Construction Code or ASME Section III will be infringed upon prior to the next scheduled monitoring activity.

- Type A and partial-structural Type B reinforcing sleeves completely encompass the degraded areas, are designed to accommodate maximum predicted degradation, and must be removed no later than the next refueling outage. The Code Case requires that they be visually observed at least once per month to monitor for evidence of leakage. If the areas containing these types of sleeves are not accessible for direct observation, then monitoring will be accomplished by visual assessment of surrounding areas, or ground surface areas above such sleeves on buried piping, or by monitoring of leakage collection systems, if available.

When used on buried piping, the area of full-structural Type B reinforcing sleeves must be physically accessible for the required examinations (both visual and ultrasonic) which could necessitate installation of removable barriers at the repair location in lieu of backfilling the pipe at that location. For Type A and partial-structural Type B reinforcing sleeves installed on buried piping, the monitoring will be based on visual assessment as discussed above.

Code Case N-786-1 restricts application of reinforcing sleeves to pipe and welded fittings, prohibiting their application on pumps, valves, expansion joints, vessels, heat exchangers, tubing, flanges, flanged joints, socket welded or threaded joints, or branch connection welds. In addition, the Code Case only permits branch connections to be installed on Type B reinforcing sleeves when required for filling or venting purposes during installation or leakage testing of the sleeve, and restricts such connections to Nominal Pipe Size (NPS) 1" or smaller in size.

As stated in the Inquiry and Reply, Code Case N-786-1 states that the code case may be used to repair degraded carbon steel piping experiencing internal wall thinning due to localized erosion, corrosion, pitting, or cavitation. Therefore, the Inservice Inspection monitoring requirements in Section 8 of the code case apply to all degraded conditions including cavitation. These requirements are summarized below:

- Type A and Partial-Structural Type B Reinforcement Sleeves [Para. 8(d) and 8(e)]
  - Visual monitoring shall be performed at least monthly for evidence of leakage
  - Maximum service life of these reinforcement sleeves is the time to the end of the next refueling outage.
- Type B Full-Structural Reinforcement Sleeves [Para. 8(c)]
  - Thickness monitoring shall be performed at least every refueling outage to verify that minimum design thicknesses are not violated. More frequent thickness monitoring shall be performed when warranted by the observed degradation rates. In all cases, the design thickness is required to be maintained at least until the performance of the next scheduled thickness inspection.
  - Maximum service life of these reinforcement sleeves is as determined by the design.

Code Case N-786-1 was approved by ASME Board on Nuclear Codes and Standards in January, 2015. However, it has not been incorporated into Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," and, thus, is not available for application at nuclear power plants without specific NRC approval.

7. Duration of Proposed Alternative

Use of the proposed alternative is requested for the duration of the ISI intervals identified in Section 3.

Code Case N-786-1, paragraphs 3.1(a) and 3.1(b)(2) require that Type A and partial structural Type B reinforcing sleeves, including those installed during refueling outages or any time during an operating cycle, shall not remain in service beyond the next refueling outage, when a permanent repair or replacement must be performed. SNC will comply with this requirement with the following clarifications:

- Reinforcing sleeves installed before the end of the 10-year ISI interval will be removed during the next refueling outage after installation, even if that refueling outage occurs after the end of the 10-year ISI Interval. In this case, absent detrimental defects or degradation, duration of the proposed alternative would be until the first refueling outage after the end date of the ISI Interval for the applicable SNC plant.

- Some piping systems are required to be functional and cannot be repaired during refueling outages. The repair of this piping can only be performed when the plant is operating. For this unique case, Type A and partial-structural Type B reinforcing sleeves will be removed prior to the next refueling outage unless specific regulatory relief is obtained. It should be noted that the removal of the reinforcing sleeve might extend beyond the end date of the ISI Interval but would be removed prior to the next refueling outage.

Full-structural Type B reinforcing sleeves may remain in-service for the design life of the repair as specified in Code Case N-786-1, paragraph 3.1(b)(1). SNC commits to continued inservice thickness monitoring and evaluation in accordance with this alternative for any full-structural Type B sleeve remaining installed at the end of the ISI intervals identified in Section 3.

8. Precedents

Several plants have received approval for either ASME Code Case N-786 or N-786-1.

9. References

1) Exelon Generation Company, LLC, *Safety Evaluation for Use of Code Case N-786*, July 31, 2014; ADAMS Accession No. ML14175B593.

2) Entergy Operations Inc. and Entergy Nuclear Operations, Inc. (Entergy), *Safety Evaluation for Use of Code Case N-786-1*, June 6, 2016, ADAMS Accession No. ML16096A269.

Edwin I. Hatch Nuclear Plant - Units 1 and 2
Joseph M. Farley Nuclear Plant - Units 1 and 2
Proposed Alternative GEN-ISI-ALT-2017-02 in Accordance with 10 CFR 50.55a(z)(2) to Utilize ASME Code Case N-789-1

Enclosure 2
Proposed Alternative GEN-ISI-ALT-2017-02, Version 1.0

10 CFR 50.55a Request No. GEN-ISI-ALT-2017-02
Implementation of Code Case N-789-1
Farley Nuclear Plant Units 1 and 2
Hatch Nuclear Plant Units 1 and 2
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Hardship without a Compensating Increase in Qualify and Safety

1. ASME Code Component(s) Affected

This ISI Alternative applies to all ASME Class 2 and 3 carbon steel raw water piping systems with less than or equal to 200°F (93°C) and less than or equal to 275 psig (1.9 MPa) maximum operating conditions. Raw water is defined as water such as a river, lake, or well or brackish/salt water used in plant equipment, area coolers, and heat exchangers. In many plants, it is referred to as "Service Water."

2. Requested Approval Date

Approval is requested by May 31, 2018.

3. Applicable Code Edition and Addenda

The following table identifies the ASME Section XI Code of Record for performing Inservice Inspection (ISI) activities at each applicable Southern Nuclear (SNC) site.

Plant	ISI Interval	ASME Section XI Edition/Addenda	Interval Start	Interval End
Farley Nuclear Plant Units 1 and 2	5	2007 Edition/2008 Addenda	12/01/2017	11/30/2027
Hatch Nuclear Plant, Units 1 and 2	5	2007 Edition/2008 Addenda	01/01/2016	12/31/2025

Both Farley and Hatch will have implemented the repair/replacement requirements of the 2007 Edition with the 2008 Addenda prior to the expected NRC-approval due date for this ISI Alternative.

4. Applicable Code Requirements

The Editions/Addenda of ASME Section XI for which the alternative is requested is the 2007 Edition with the 2008 Addenda. Subsection IWA-4000 of this Edition and Addenda provide requirements for welding, brazing, metal removal, and installation of repair/replacement activities.

5. Reason for Request

IWA-4000 requires replacement or internal weld repair of wall-thinning conditions resulting from degradation to be in accordance with the Owner's Requirements and the original or later Construction Code. However, the repair and replacement provisions of IWA-4000 cannot always be utilized when degradation or leakage is identified during plant operations. Other approved alternative repair or evaluation methods are not always practicable because of wall thinness and/or moisture issues. The proposed alternative will permit installation of a technically sound temporary repair to provide adequate time for evaluation, design, material procurement, planning, and scheduling of an appropriate permanent repair or replacement of the defective piping, considering the impact on system availability, maintenance rule applicability, and availability of replacement materials. Without this repair option, compliance with the specified requirements of IWA-4000 would result in hardship and/or unusual difficulty -including higher risks associated with plant shut-downs and extended technical specification actions - without a compensating increase in the level of quality and safety.

6. Proposed Alternative and Basis for Use

Proposed Alternative

Pursuant to 10CFR50.55a(z)(2), SNC proposes to implement the requirements of Code Case N-789-1 as a temporary repair of degradation in Class 2 and 3 raw water piping systems with less than or equal to 200°F (93°C) and less than or equal to 275 psig (1.9 MPa) maximum operating conditions resulting from mechanisms such as erosion, corrosion, cavitation, or pitting, but excluding conditions involving flow accelerated corrosion (FAC), corrosion-assisted cracking, or any other form or cracking. These types of defects are typically identified by small leaks in the piping system or by pre-emptive, non-code required examinations performed to monitor the degradation mechanisms. This repair technique involves welding a metal reinforcing pad - pressure pad or structural pad - to the exterior of piping system to reinforce the degraded area and restore pressure integrity. This repair will be used when its temporary repair method is suitable for the particular defect and type of degradation present.

The Code Case requires that the cause of the degradation be determined, and that the extent and rate of degradation in the piping be evaluated to ensure there are no other unacceptable locations within the surrounding area that could affect the integrity of the repaired piping. The area of evaluation is dependent on the degradation mechanism present.

Code Case Clarifications

SNC implementation of Code Case N-789-1 will include the following clarifications and alternatives:

1) Regarding paragraph 3.1(a)(1) of the Code Case, SNC designs of pressure pads will be based on a corrosion rate of 2 times the actual measured corrosion rate in that location. If a repair must be performed without sufficient time to determine the actual rate of corrosion at the repair location, then the pressure pad design will be based on a corrosion rate that is 4 times the estimated maximum (worst-case) corrosion rate for the same degradation mechanism in that system.

2) When gasket material is used in accordance with paragraph 3.2(i) of the Code Case (water-backed applications), SNC will also require removal of any residual moisture by heating prior to welding.

3) Regarding paragraph 8(b) of the Code Case, SNC will perform monitoring on a monthly basis during the first quarter as required by Code Case N-789-1. The subsequent monitoring frequency shall be based on corrosion rates calculated using reductions in thicknesses since the previous monitoring inspection, but at least quarterly.

4) Sections 1, 3, 5, and 6 of the Code Case specify that materials, design, installation, and examination of reinforcement pads shall be performed in accordance with the Construction Code or ASME Section III applicable to each SNC site. As allowed by IWA-4200 and IWA-4411, later Editions and Addenda of the Construction Code or ASME Section III may be used provided any required reconciliations are performed. However, only Editions/Addenda of ASME Section III that have been approved by the NRC in 10 CFR 50.55a will be used.

5) SNC performs repair/replacement activities in accordance with a fleet-wide, standardized Repair/Replacement Program based on the 2001 Edition / 2003 Addenda of ASME Section XI. Therefore, this Edition/Addenda of ASME Section XI will be used by all plants whenever the Code Case refers to IWA-4000 until the Code bases of the Repair / Replacement Program is updated as explained in Section 2 of this request.

Code Case Alternatives

1) Paragraph 3.2(l) of the Code Case includes an incorrect reference to NC-2650 for the flexibility analysis associated with Class 2 designs. The correct reference should be NC-3650. SNC will comply with NC-3650.

Basis for Use

Code Case N-789-1 includes requirements for incorporating actual or estimated corrosion rates in the design of all reinforcing pads. For pressure pads that cannot be directly measured for the on-going effects of corrosion, rates of twice the measured actual or four times the worst-case corrosion for the system must be incorporated in the design. Structural pads are required to be directly measured for the on-going effects of corrosion, so these conservative multipliers do not apply to the design of reinforcing pads. In addition, compensatory measures are included to account for any uncertainties in the corrosion rates used, thus providing reasonable assurance that structural integrity and leakage integrity will be maintained. These measures include limiting the design life of reinforcing pads to a maximum of one refueling cycle, and requiring on-going monitoring as follows:

- For structural pads, including their attachment welds and the surrounding area, a baseline thickness examination will be performed followed by monthly thickness monitoring for the first three months. The subsequent examination frequency will be a minimum of quarterly.

- Areas containing pressure pads will be visually observed at least once per month to monitor for evidence of leakage. If the areas containing pressure pads are not accessible for direct observation, then monitoring will be accomplished by visual assessment of surrounding areas, or ground surface areas above pressure pads on buried piping, or by monitoring of leakage collection systems, if available.

Regardless of when during a fuel cycle a repair is performed, each repair will be considered to have a maximum service life until no later than the end of the next refueling outage when a permanent repair or replacement must be performed. The Code Case specifies additional requirements for design of reinforcing pads, installation, examination, pressure testing, and inservice monitoring.

Code Case N-789-1 was approved by ASME Codes and Standards on November 13, 2013; however, it has not been incorporated into Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," and, thus, is not available for application at nuclear power plants without specific NRC approval.

Raw water piping systems, such as Service Water, may experience wall thinning due to internal degradation. When this occurs, SNC's preference would be to perform a code repair in accordance with IWA-4000 of ASME Section XI. IWA-4000 repairs, such as pipe replacement and internal weld repair, are preferable because they are approved by the NRC in 10 CFR 50, permanent, and do not require a supplemental replacement during the next refueling outage. However, performance of IWA-4000 repairs is not always possible or may result in unnecessary plant risk for one or more of the following reasons:

- Longer repair times may challenge the Technical Specification (TS) completion time or necessitate a plant shutdown because the repair cannot be performed within the TS completion time.

- Isolation of the affected piping to facilitate performance of an IWA-4000 repair may result in a plant configuration or condition which sufficiently increases the likelihood of an initiating event (e.g., plant scram, loss of power, turbine trip) or plant coping capability resulting in an unacceptable level of plant risk. Equipment out-of-service considerations (e.g., degree of available redundancy for performing the safety function served by out-of-service equipment, effects on key safety functions, duration of out-of-service condition, likelihood of an initiating event or accident that would require performance of the safety function, etc.) are evaluated in accordance with SNC procedures.

- An IWA-4000 repair, such as pipe replacement or internal weld repair, may not be possible due to excessive leakage by a valve seat or inability to isolate the degraded piping.

- Replacement materials may not be available or additional time may be needed to develop plans for performing an IWA-4000 repair or replacement. The proposed alternative provides adequate time for evaluation, design, material procurement, planning, and scheduling of an appropriate permanent repair or replacement of the defective piping, considering the impact on system availability.

In conclusion, SNC would perform the proposed alternative due to the existence of one or more of the conditions described above.

7. Duration of Proposed Alternative

Use of the proposed alternative is requested for the duration of the ISI intervals identified in Section 3.

Code Case N-789-1, paragraph 1(e) requires that reinforcing pads, including those installed during refueling outages, shall not remain in service beyond the end of the next refueling outage. Therefore, regardless of when the pressure or structural pad is installed, SNC will comply with this requirement with the following clarifications:

- Reinforcing pads installed before the end of the 10-year ISI interval will be removed during the next refueling outage after installation, even if that refueling outage occurs after the 10-year ISI interval. In this case, absent detrimental defects or degradation, the duration of the proposed alternative would be until the first refueling outage after the end date of the ISI interval for the applicable SNC plant.

- Some piping systems are required to be functional and cannot be repaired during refueling outages. The repair of this piping can only be performed when the plant is operating. For this unique case, the reinforcing pad will have to be removed prior to, but no later than, the refueling outage unless specific regulatory relief is obtained. For piping systems which must remain functional during refueling outages, SNC will remove the reinforcing pad(s) prior to the refueling outage that is scheduled at the end of the fuel cycle during which the repair is performed.

8. Precedents

Several Licensees have received approval for either ASME Code Case N-789 or N-789-1.

9. References

1) Exelon Generation Company, LLC, Safety Evaluation for Use of Code Case N-789, July 31,2014; Adams Accession No. ML14175B593.

2) Xcel Energy, Safety Evaluation for Use of Code Case N-789-1, May 4, 2015; Adams Accession No. ML15079A003.

3) Entergy Operations Inc. and Entergy Nuclear Operations, Inc. (Entergy), Safety Evaluation for Use of Code Case N-789-1, May 31, 2016; Adams Accession No. ML16093A028.