

MAY 17 2018

Docket Nos.: 50-321

NL-18-0713

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

Edwin I. Hatch Nuclear Plant – Unit 1  
Request for Alternative HNP-ISI-ALT-05-08 to Implement Code Case N-513-4, "Evaluation  
Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping" for Hatch  
Unit 1 Plant Service Water

Ladies and Gentlemen:

In accordance with the provisions of 10 CFR 50.55a(z)(2), Southern Nuclear Operating Company (SNC) hereby requests Nuclear Regulatory Commission (NRC) approval of proposed inservice inspection (ISI) alternative HNP-ISI-ALT-05-08, Version 1. For Hatch Nuclear Plant (HNP) Unit 1, this alternative will allow utilization of Code Case N-513-4 on leak discovered in a 30-inch Class 3 Elbow on "A" Loop of Plant Service Water System.

SNC is requesting approval to apply the evaluation methods of ASME Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," to this Class 3 component that meets the operational and configuration limitations of Code Case N-513-4, paragraphs 1 (a), 1 (b), 1 (c), and 1 (d) to avoid increased plant risk associated with a plant shutdown to comply with the cited Code requirements.

These proposed alternatives are being submitted in accordance with 10 CFR 50.55a(z)(2), "hardship without a compensating increase in the level of quality and safety" to allow SNC to perform additional extent of condition examinations on the affected systems while allowing time for safe and orderly long-term repair actions if necessary.

SNC requests NRC review and approval of this alternative by May 18, 2018.

This letter contains no NRC commitments. If you have any questions, please contact Jamie Coleman at 205-992-6611.

Respectfully submitted,

  
C. A. Gayheart  
Regulatory Affairs Director

CAG/PDB

Enclosure: HNP-ISI-ALT-05-08 to Implement Code Case N-513-4

Cc: Regional Administrator, Region II  
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RTYPE: CFA04.054, CHA02.004

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**Enclosure**

**HNP-ISI-ALT-05-08 to Implement Code Case N-513-4**

**Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)  
Hardship without a Compensating Increase in Quality and Safety**

**1. ASME Code Component(s) Affected**

Section XI, 30-inch Class 3 Elbow in Plant Service Water System downstream of valve 1P41-F305A

**2. Applicable Code Edition and Addenda**

ASME Section XI, 2007 Edition through 2008 Addenda

**3. Applicable Code Requirements**

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

**4. Reason for Request**

On May 14, 2018 a through wall leak was discovered in a 30-inch Class 3 Elbow in the Plant Service Water System. Nominal thickness of the pipe is 0.375 inch. The leak is on Unit 1 "A" Loop, downstream of valve 1P41-F305A on the southside of the strainer pit. The flaw leakage was quantified (by calculating the time it took the water to fill a container of known volume) as three (3) gallons per minute. There are no electrical components in the general area that would be impacted by spray concerns. Water is flowing to the sumps which can handle the additional water. Due to the location of the leak, the leak cannot be isolated without completely isolating the system. The design pressure and temperature are 180 psig and 125°F (respectively), while the actual operating pressure and temperature of the system are approximately 130 psig and less than (<) 97°F.

The area around the flaw was examined using ultrasonic technique. The technique revealed localized wall thinning with a flaw about the size of a quarter to a half dollar. Specifically, the lowest points at radius 1.0 in., 1.5 in., 2.0 in., 2.5 in., and 3.0 in. were documented as 0.123 in., 0.252 in, 0.318 in., 0.429 in., and 0.403 in. (respectively). Once outside the 1.0 in. radius the data indicated that all other points (beside the previously mentioned low point) meet or exceeded nominal wall thickness of the pipe.

In accordance with 10 CFR 50.55a(z)(2), Southern Nuclear Operating Company (SNC) is requesting an alternative from the requirement to perform a code repair/replacement activity for the degraded Class 3 Piping whose maximum operating temperature does not exceed 200°F and whose maximum operating pressure does not exceed 275 psig. To perform a Code repair, a plant shutdown would be required because the leak is not isolable during normal operation. Plant shutdown activities would result in additional plant risk that would be inappropriate when a degraded condition can be demonstrated to retain adequate margin to complete the component's safety function. The use of an acceptable alternative analysis method in lieu of immediate action for the degraded condition will allow SNC to perform additional extent of condition examinations on the affected systems while allowing time for safe and orderly long-term repair actions if necessary. Actions to remove the degraded piping from service could have a detrimental overall risk impact by requiring a plant shutdown, thus requiring use of a system that is in standby during normal operation. Accordingly, compliance with the current code

requirements results in a hardship without a compensating increase in the level of quality and safety.

ASME Code Case N-513-3 does not allow evaluation of flaws located away from attaching circumferential piping welds that are in elbows, bent pipe, reducers, expanders, and branch tees. ASME Code Case N-513-4 provides guidance for evaluation of flaws in these locations. Application of the Code Case assures that the elbow degraded area will retain structural and leakage integrity until a Code compliant repair is completed. Per the requirements of Code Case N-513-4, a Code compliant repair will be implemented no later than the end of the next Hatch Unit 1 Refueling Outage (Spring 2020 – 1R29) via work order SNC945822.

## 5. Proposed Alternative and Basis for Use

SNC is requesting approval to apply the evaluation methods of ASME Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," to this Class 3 Component that meets the operational and configuration limitations of Code Case N-513-4, paragraphs 1 (a), 1 (b), 1 (c), and 1 (d) to avoid increased plant risk associated with a plant shutdown to comply with the cited Code requirements.

The NRC issued Generic Letter 90-05 (Reference 1), "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping (Generic Letter 90-05)," to address the acceptability of limited degradation in piping with maximum operating conditions less than or equal to 200°F (93°C) and less than or equal to 275 psig (1.9 MPa). The generic letter defines conditions that would be acceptable to utilize temporary non-code repairs with NRC approval. ASME recognized that relatively small flaws could remain in service without risk to the structural integrity of a piping system and developed Code Case N-513. The NRC approval of Code Case N-513-3 in Regulatory Guide 1.147 (Reference 2), "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," allows acceptance of partial through-wall or through-wall leaks for an operating cycle provided all conditions of the Code Case and NRC conditions are met. The Code Case also requires the Owner to demonstrate system operability due to leakage.

ASME recognized that the limitations in Code Case N-513-3 were preventing needed use in piping components such as elbows, bent pipe, reducers, expanders, and branch tees and external tubing or piping attached to heat exchangers. Code Case N-513-4 was approved by the ASME to expand use on these locations and to revise several other areas of the Code Case. Attachment 2 of the Reference 3 letter provides a marked-up N-513-3 version of the Code Case to highlight the changes compared to the NRC approved N-513-3 version. Attachment 3 of the Reference 3 letter provides the ASME approved Code Case N-513-4. The following provides a high-level overview of the Code Case N-513-4 changes:

- 1) Revised the maximum allowed time of use from no longer than 26 months to the next scheduled refueling outage.
- 2) Added applicability to piping elbows, bent pipe, reducers, expanders, and branch tees where the flaw is located more than  $(R_0t)^{1/2}$  from the centerline of the attaching circumferential piping weld.
- 3) Expanded use to external tubing or piping attached to heat exchangers.
- 4) Revised to limit the use to liquid systems.
- 5) Revised to clarify treatment of Service Level load combinations.
- 6) Revised to address treatment of flaws in austenitic pipe flux welds.
- 7) Revised to require minimum wall thickness acceptance criteria to consider longitudinal stress in addition to hoop stress.

8) Other minor editorial changes to improve the clarity of the Code Case.

Detailed discussion of significant changes in Code Case N-513-4 when compared to NRC approved Code Case N-513-3 is provided in Attachment 4 of the Reference 3 letter.

The design basis is considered for each leak and evaluated using the SNC Operability Evaluation process. The evaluation process must consider requirements or commitments established for the system, continued degradation and potential consequences, operating experience, and engineering judgment. As required by the Code Case, the evaluation process considers but is not limited to system make-up capacity, containment integrity with the leak not isolated, effects on adjacent equipment, and the potential for room flooding.

Leakage rate is not typically a good indicator of overall structural stability in moderate energy systems, where the allowable through-wall flaw sizes are often on the order of inches (ML14240A603, ML14316A167, ML15070A428). The periodic inspection interval defined using paragraph 2(e) of Code Case N-513-4 provides evidence that a leaking flaw continues to meet the flaw acceptance criteria and that the flaw growth rate is such that the flaw will not grow to an unacceptable size.

The effects of leakage may impact the operability determination or the plant flooding analyses specified in paragraph 1 (f). For a leaking flaw, the allowable leakage rate will be determined by dividing the critical leakage rate by a safety factor of four (4). The critical leakage rate is determined as the lowest leakage rate that can be tolerated and may be based on the allowable loss of inventory or the maximum leakage that can be tolerated relative to room flooding, among others. The safety factor of four (4) on leakage is based upon Code Case N-705 (Reference 4), which is accepted without condition in Regulatory Guide 1.147, Revision 18. Paragraph 2.2(e) of N-705 requires a safety factor of two (2) on flaw size when estimating the flaw size from the leakage rate. This corresponds to a safety factor of four (4) on leakage for nonplanar flaws. Although the use of a safety factor for determination of an unknown flaw is considered conservative when the actual flaw size is known, this approach is deemed acceptable based upon the precedent of Code Case N-705. Note that the alternative herein does not propose to use any portion of Code Case N-705 and that citation of N-705 is intended only to provide technical basis for the safety factor on leakage.

During the temporary acceptance period, the leaking flaw(s) will be monitored daily as required by paragraph 2(f) of Code Case N-513-4 to confirm the analysis conditions used in the evaluation remain valid. Significant change in the leakage rate is reason to question that the analysis conditions remain valid, and would require re-inspection per paragraph 2(f) of the Code Case. Any re-inspection must be performed in accordance with paragraph 2(a) of the Code Case.

The leakage limit provides quantitative measurable limits which ensure the operability of the system and early identification of issues that could erode defense-in-depth and lead to adverse consequences.

In summary, SNC will apply ASME Code Case N-513-4 to evaluate the leak discovered in a 30-inch Class 3 Elbow on "A" Loop of Plant Service Water System. Code Case N-513-4 utilizes technical evaluation approaches that are based on principals that are accepted in other Code documents already acceptable to the NRC. The application of this code case, in concert with safety factors on leakage limits, will maintain acceptable structural and leakage integrity while minimizing plant risk by minimizing the number of plant transients that could be incurred if degradation is required to be repaired based on ASME Section XI acceptance criteria only.

**6. Duration of Proposed Alternative**

This relief will be applicable until a Code compliant repair is complete. The repair will be implemented no later than the end of the next Hatch Unit 1 refueling outage or before exceeding the temporary acceptance criteria of Code Case N-513-4, whichever comes first.

**7. Precedents**

There have also been several submittals approved for N-513-4 use in specific applications. The table below lists several Safety Evaluation Reports as precedents for use of Code Case N-513-4.

SER Accession No.	Plant	Application	Additional Requirement
ML16230A237	Exelon Fleet	Generic N-513-4	Critical leakage determination
ML15070A428	ANO	Leaking Sweepolet	5 gpm leakage limit
ML14316A167	Fort Calhoun	Leaking Elbow	None
ML14335A551	Peach Bottom	Leaking Elbow	5 gpm leakage limit

**8. References**

1. NRC Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping (Generic Letter 90-05)"
2. Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 18, March 2017.
3. Letter from D. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Proposed Alternative to Utilize Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1 ", dated January 28, 2016 (ML16029A003).
4. ASME Boiler and Pressure Vessel Code, Code Case N-705, "Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks Section XI, Division 1," October 12, 2006.