March 3, 2000

Mr. D. N. Morey
Vice President - Farley Project
Southern Nuclear Operating
Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2, RE: INSERVICE INSPECTION RELIEF REQUEST NOS. 31 THROUGH 39 (TAC NOS. MA4984 AND MA4985)

Dear Mr. Morey:

Your letter of March 3, 1999, submitted Unit 1 and Unit 2 relief requests RR-31 through RR-39 to us. Based on our review of the information you provided, we authorize or grant your relief requests as shown in the table below.

Relief Request No.	Status
RR-31 through RR-33 and RR-38	Proposed alternatives authorized pursuant to 10 CFR 50.55a(a)(3)(ii).
RR-34 and RR-36	Proposed alternatives authorized pursuant to 10 CFR 50.55a(a)(3)(i).
RR-35 and RR-39	Withdrawn
RR-37	Granted pursuant to 10 CFR 50.55a(g)(6)(i).

The Enclosure contains our Safety Evaluation. Please contact me at (301) 415-1423 if you have any questions.

Sincerely,

/RA/

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

Docket Nos. 50-348 and 50-364

Enclosure: As stated

cc w/encl: See next page

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Joseph M. Farley Nuclear Plant

cc:

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REVIEW BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE STEAM GENERATOR 90-DAY REPORT

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

SOUTHERN NUCLEAR OPERATING COMPANY

DOCKET NOS. 50-348 AND 50-364

1.0 INTRODUCTION

In the Federal Register dated August 8, 1996 (61 FR 41303), the Nuclear Regulatory Commission (NRC) amended its regulations to incorporate the 1992 edition with 1992 addenda of Subsections IWE and IWL of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code (Code) by reference. Subsections IWE and IWL give the requirements for inservice inspection (ISI) of concrete containments (Class CC) and metallic containments (Class MC) of light-water nuclear power plants. The effective date for the amended rule was September 9, 1996. The rule requires licensees to incorporate the new requirements into their ISI plans and to complete the first containment inspection by September 9, 2001. However, a licensee may propose alternatives to or submit a request for relief from the requirements of the regulation pursuant to 10 CFR 50.55a(a)(3) or (g)(5), respectively.

Inservice inspection of ASME Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME B&PV Code and applicable addenda as required by 10 CFR 50.55a(g), except where the Commission grants specific written relief pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that licensees may use alternatives to the requirements of paragraph (g) when authorized by the NRC if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that ISI of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for the Farley, Units 1 and 2, third 10-year ISI interval is the 1989 of the ASME Boiler and Pressure Vessel Code.

Enclosure

Southern Nuclear Operating Company's (SNC's) letters of March 3 and September 23, 1999, proposed several alternatives to the ISI requirements of of Section XI of the ASME Code for its J. M. Farley Nuclear Plant (FNP), Units 1 and 2. The NRC's evaluations with respect to authorizing or denying the proposed alternatives are discussed below.

2.0 EVALUATION

SNC's Farley, Units 1 and 2, relief requests and the staff's evaluations follow.

2.1 Relief Request RR-31 (As stated)

2.1.1 Code Requirements

10 CFR 50.55a was amended in the Federal Register on August 8, 1996, to require the use of the ASME Section XI, 1992 Edition, 1992 Addenda, when performing containment examinations. The 1992 Edition with 1992 Addenda of ASME Section XI, Table IWE 2500-1, Examination Category E-D, Item Numbers E5.10 and E5.20, requires seals and gaskets on airlocks, hatches, and other devices that are required to assure containment leak-tight integrity to be visually examined once each interval.

2.1.2. Specific Relief Requested

Seals (including O-rings) and gaskets of Class MC (Metallic Containment) pressure retaining components, Examination Category E-D, Item Numbers E5.10 and E5.20.

This request for relief applies to the following components that incorporate seals and gaskets as the containment pressure boundary:

- Electrical penetrations.
- Two personnel airlock doors with seals, including door operating mechanism penetrations that are part of the containment pressure boundary and the containment equipment hatch.
- Containment penetrations whose design incorporates resilient seals, gaskets, or sealant compounds.

2.1.3. SNC's Basis for Requesting Relief

Practical VT-3 visual examination considerations of these seals and gaskets would require the joints to be disassembled since many of the surfaces of seals and gaskets are normally inaccessible. The ASME Code Committee recognized that disassembly of the joints to perform visual examinations was not warranted, and the 1998 Edition of ASME Section XI removed the examination requirement.

The proposed alternate examination (Appendix J, Option B) provides a periodic, non-intrusive test method which will ensure that the integrity of the seals and gaskets is being maintained. As noted in 10 CFR 50, Appendix J, the purpose of the testing is to ensure that leakage of containment penetrations whose design incorporates resilient seals, gaskets, sealant compounds, and electrical penetrations fitted with seal assemblies remains below established limits. Damage to seals or gaskets, which could affect containment integrity, is best detected with this type of test and will be performed as follows:

Electrical Penetrations And Containment Penetrations Whose Design Incorporates Resilient Seals, Gaskets, Or Sealant Compounds

Those penetrations that are not disassembled during the 10-year interval will receive an Appendix J, Option B test at least once in the 10-year interval. For those penetrations that are disassembled or opened, an Appendix J test is required upon final assembly prior to start-up. Additionally, if a seal including O-rings or gasket is replaced, it will be visually inspected by maintenance personnel before reassembly or closure. These tests and inspections will assure the leak tightness of primary containment and provide an acceptable level of quality and safety.

Airlocks and the Containment Equipment Hatch

The personnel airlocks are opened as needed during maintenance outages and refueling outages. Prior to final closure, the accessible portions of gaskets and the door sealing faces are inspected for damage that could affect the leak tightness of the seal. If gasket replacement is necessary, the new gasket will be visually inspected by maintenance personnel before re-assembly or closure. Door seals will be tested in accordance with Appendix J within seven days of opening and once every 30 days during periods of frequent opening.

The containment equipment hatch is normally removed during refueling outages. If gasket replacement is necessary, the new gasket will be visually inspected by maintenance personnel before re-assembly or closure. Prior to establishing containment integrity following the refueling outage, the containment equipment hatch is leak rate tested in accordance with Appendix J.

These tests and inspections will assure the leak tightness of primary containment and provide an acceptable level of quality and safety.

2.1.4 Proposed Alternate Examination

The leak-tightness of the seals (including O-rings) and gaskets will be confirmed in accordance with 10 CFR 50, Appendix J as described above. If a seal (including O-rings) or a gasket is replaced, it will be visually inspected by maintenance personnel before re-assembly or closure. Also, an as-left Appendix J leakage test will be performed after installation to ensure leak-tightness.

2.1.5 SNC's Justification for Requesting Relief

The functional capability of the containment penetration seals and gaskets (including those of electrical penetrations) will continue to be verified during the Type B testing as required by 10 CFR 50, Appendix J. The alternative examinations are adequate to ensure the integrity of the Farley containment penetration seals and gaskets, and will provide an acceptable level of quality and safety. Therefore, relief should be granted per 10 CFR 50.55a(a)(3)(i).

2.1.6 Staff Evaluation of RR-31

SNC proposes to use, in lieu of performing the VT-3 examinations for containment penetration seals and gaskets, the current program for leakage testing containment penetrations in accordance with 10 CFR Part 50, Appendix J.

The staff finds that because the seals and gaskets associated with these penetrations are not accessible for examination when the penetration is assembled, containment penetration seals and gaskets must be disassembled and reassembled for the purpose of performing the VT-3 visual examination. Disassembly and re-assembly of seals and gaskets associated with a VT-3 visual examination would introduce the possibility of component damage that would not otherwise occur. The periodic test of penetrations in accordance with 10 CFR Part 50, Appendix J will detect local leaks at containment peak accident pressure and measure leakage across the leakage-limiting boundary of containment penetrations whose design incorporates resilient seals, gaskets, sealant compounds, and electrical penetrations fitted with flexible metal seal assemblies. If unacceptable leakage is identified during the test, corrective measures would be taken.

The ASME Code Committee recognized that disassembly of joints for the sole purpose of performing the visual examination is unwarranted, and the 1998 Edition of ASME Section XI removed these examination requirements. Requiring SNC to disassemble components for the sole purpose of inspecting seals and gaskets would result in a hardship without a compensating increase in the level of quality and safety.

Based on the discussion above, the staff concludes that the alternative proposed by SNC will provide reasonable assurance of the leak-tight integrity of the containment penetration seals and gaskets. Therefore, the alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that complying with the specific requirements of the Code would result in hardship without a compensating increase in the level of quality and safety.

2.2 Relief Request RR-32 (As stated)

2.2.1 Code Requirement

10 CFR 50.55a was amended in the Federal Register on August 8, 1996, to require the use of ASME Section XI, 1992 Edition, 1992 Addenda, when performing containment examinations. The 1992 Edition with 1992 Addenda of

ASME Section XI, Table IWE 2500-1, Examination Category E-G, Item Number E8.10 requires a VT-1 examination of the bolted connections and Item Number E8.20 requires a bolt torque or tension test for bolted connections that have not been disassembled, inspected, and reassembled during the inspection interval.

2.2.2 Specific Relief Requested

Relief is requested from performing the Code-required visual examination and the torque or tension test on the above identified pressure retaining bolting.

2.2.3 SNC's Basis for Requesting Relief

Each of these electrical penetrations receive a periodic 10 CFR 50, Appendix J, Option B test at least once per interval. The performance of the Type B test proves that the bolt torque or tension remains adequate under simulated accident pressure conditions to restrict leakage to acceptable limits.

Once a bolt in a containment penetration is torqued or tensioned, it should not be subject to dynamic loading that could cause it to experience significant change. The Appendix J testing is adequate to demonstrate that the design function is met.

Torque or tension testing is not required for ASME Section XI, Class 1, 2, or 3 bolted connections or their supports as part of the inservice inspection program. The ASME Code Committee recognized that these tests were not warranted, and the 1998 Edition of the ASME Section XI Code has removed the examination requirement.

The alternate examination will ensure the bolt torque or tension remains adequate. This will ensure the structural integrity and leak-tightness of this pressure retaining bolting.

2.2.4 Proposed Alternate Examination

The electrical penetrations shall receive an Appendix J test at least once every interval to ensure the bolt torque or tension remains adequate. This will ensure the structural integrity and leak-tightness of Class MC (Metallic Containment) pressure retaining bolting.

2.2.5 SNC's Justification for Requesting Relief

Leak testing per 10 CFR 50, Appendix J will provide assurance of the integrity of pressure-retaining bolting and is an acceptable alternative to the 1992 Code-required visual and bolt torque or tension test. Public health and safety will not be endangered; therefore, this relief request should be granted pursuant to the requirements of 10 CFR 50.55a(a)(3)(i).

2.2.6 Staff Evaluation of I-RR-32

ASME Section XI, 1992 Edition with the 1992 Addenda, Table IWE-2500-1, “Examination Category E-G, Pressure Retaining Bolting,” Item E8.20 requires bolt torque or tension testing on bolted connections that have not been disassembled and reassembled during the inspection interval. This examination is used to aid in determining that leak-tight seals exist and that the structural integrity of the subject bolted connections is maintained. SNC proposes to use the 10 CFR Part 50, Appendix J, Type B test as an alternative to the Code requirement to verify the integrity of penetrations with bolted connections.

Bolt torque or tension testing on bolted connections that have not been disassembled and reassembled during the inspection interval would require the bolting be un-torqued and then re-torqued or re-tensioned. However, leak testing required by 10 CFR Part 50, Appendix J would adequately verify the leak-tight integrity of the containment. The staff finds that complying with ASME Code requirements will cause a hardship or unusual difficulty because un-torquing and subsequent re-torquing bolted connections involve unnecessary radiation exposure and costs to perform the work without a compensating increase in the level of quality and safety. The staff also finds that the alternative approach proposed by SNC (the test required by 10 CFR Part 50, Appendix J to verify the leak-tight integrity of bolted connections for containment vessel leak-tight integrity) will provide reasonable assurance of the containment pressure boundary integrity. On this basis, the staff concludes that the alternative proposed by SNC is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

2.3 Relief Request RR-33 (As stated)

2.3.1 Code Requirements

10 CFR 50.55a was amended in the Federal Register on August 8, 1996, to require the use of the ASME Section XI, 1992 Edition, 1992 Addenda, when performing containment examinations. The 1992 Edition with 1992 Addenda of ASME Section XI, requires that when component examination results require evaluation of flaws, evaluation of areas of degradation, or repairs in accordance with Article IWE-3000, and the component is found to be acceptable for continued service, the areas containing such flaws, degradation, or repairs shall be reexamined during the next inspection period.

2.3.2 Specific Relief Requested

Relief is requested from the requirement of Paragraphs IWE-2420(b) and IWE-2420(c) to perform successive examination of components that have been repaired.

2.3.3 SNC’s Basis for Requesting Relief

The purpose of a repair is to restore the component to an acceptable condition for continued service in accordance with the acceptance standards of Article IWE-3000. When making repairs, paragraph IWA-4150 requires the owner to conduct an evaluation of the suitability of the repair including consideration of the cause of failure. Successive examinations after repair do not provide an additional safety benefit.

Repairs are performed in accordance with IWA-4000, the intent of which is to use the construction code to restore the component to its original condition where practical. If a repair has restored the component to an acceptable condition, successive examinations are not warranted. If the repair was not suitable, then the repair does not meet Code requirements and the component is not acceptable for continued service; further repair work would be necessary. No similar requirement is found for ASME Class 1, 2, or 3 Section XI repairs. Conducting successive examinations on components that have been repaired would result in hardship without a compensating increase in the level of quality and safety. Additionally, if the repair area is subject to accelerated degradation, the repair would require augmented examination in accordance with Table IWE-2500-1, Examination Category E-C.

2.3.4 Proposed Alternate Examination

Repair will be performed in accordance with IWA-4000 to restore the component to its original condition and successive examinations as required by IWE-2420(b) and (c) will not be performed. Successive examinations will continue to be done on those flaws or areas of degradation which have been accepted for continued service by evaluation.

2.3.5 SNC's Justification for Requesting Relief

Repairing components to restore the component to its original condition provides adequate assurance of the integrity of the repair. Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; therefore, relief should be granted under 10 CFR 50.55a(a)(3)(ii).

2.3.6 Staff Evaluation of RR-33

Because repairs are required to be performed in accordance with IWA-4000 to restore the component to its original condition, SNC proposed not to perform successive examinations as required by IWE-2420(b) and (c). However, SNC will continue to perform successive examinations on those flaws or areas of degradation which have been accepted for continued service by evaluation.

When repairs are complete, IWA-4150 requires utilities to evaluate the suitability of the repair. When a repair is required because of failure of an item, the evaluation will consider the cause of failure to ensure that the repair is suitable. Considering that the failure mechanism is identified and corrected as required and the repair receives required preservice examinations, the proposed alternative will provide reasonable assurance of structural integrity. Thus, the requirements of successive examinations are deemed to be unnecessary. Furthermore, IWB-2420(b), IWC-2420(b), and IWD-2420(b) do not require the successive inspection of repairs for ASME Code Class 1, 2, and 3 components as required in IWE-2420(b) for ASME Code Class MC components. On this basis, SNC's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) in that complying with the specific Code requirements would result in hardship without a compensating increase in the level of quality and safety.

2.4 Relief Request RR-34 (As stated)

2.4.1 Code Requirements

10 CFR 50.55a was amended in the Federal Register on August 8, 1996, to require the use of the ASME Section XI, 1992 Edition, 1992 Addenda, when performing containment examinations. Per the 1992 Edition of ASME Section XI, with the 1992 Addenda, the visual examination (VT-3C) of the concrete portion of the containment buildings is subject to the rules and requirements of IWL-2310, "Visual Examination and Personnel Qualification." IWL-2310 subsequently requires that the minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height will be as specified in IWA-2210 and Table IWA-2210-1 for VT-3 examinations.

2.4.2 Specific Relief Requested

Relief is requested from the IWE-2310 requirement to use the minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height specified in IWA-2210 and Table IWA-2210-1 for VT-3 examinations when performing visual examinations (VT-3C) of the concrete containment.

2.4.3 SNC's Basis for Requesting Relief

The VT-3 requirements specified in IWA-2210 and Table IWA-2210-1 were developed to examine components such as Class 1 pump and valve bodies, the Class 1 reactor pressure vessel interior, Class 3 welded attachments, and Class 1, 2, and 3 supports. VT-3 examinations are conducted to determine the general mechanical and structural condition of components and their supports by verifying parameters such as clearances, settings, and physical displacements. Additionally, VT-3 examinations are conducted to detect discontinuities and imperfections, such as loss of integrity at bolted or welded connections, loose or missing parts, debris, corrosion, wear, or erosion. For these Class 1, 2 and 3 components, small amounts of corrosion/erosion or small crack-like surface flaws may be detrimental to the structural integrity of the component; therefore, the stringent requirements of IWA-2210 and Table IWA-2210-1 are generally appropriate.

However, it was recognized by the industry and NRC during the development of the implementing 10 CFR 50.55a rules that IWA-2210 and Table IWA-2210-1 requirements were excessively stringent for the IWE required examination of the metal portion of the containment. Therefore, the NRC changed the requirements to allow the following: "When performing remotely the visual examinations required by Subsection IWE, the maximum direct distance specified in Table IWA-2210-1 may be extended and the minimum illumination requirements specified in Table IWA-2210-1 may be decreased provided that the conditions or indications for which the visual examination is performed can be detected at the chosen distance and illumination."

SNC has concluded that, similar to the consideration used for the IWE examinations, the use of the VT-3 requirements found in IWA-2210 and Table IWA-2210-1 when performing VT-3C examinations of the concrete surfaces is also excessively stringent and should not be applied. This is based on the recognition that due to the nature of concrete, a concrete containment will have numerous, small "shrinkage-type" surface cracks or other imperfections that are not detrimental to the structural integrity of the containment. The application of IWA-2210 and Table IWA-2210-1 "minimum illumination requirements," "maximum direct visual examination distance requirements," and "maximum procedure demonstration lower case character height requirements" to attempt to identify these small "shrinkage-type cracks" or other imperfections is considered to be unnecessary and could result in a large number of man-hours erecting scaffolding, using lifts, evaluating insignificant indications, etc.

Per the requirements of IWL-2320, the Registered Professional Engineer (RPE) is experienced in evaluating the inservice condition of structural concrete and is knowledgeable of the design and Construction Codes and other criteria used in design and construction of concrete containments. The RPE will use experience and training to determine the necessary requirements to detect indications that are detrimental to the containment integrity. Using knowledge of the degradation processes that could potentially be occurring and knowledge of high stress and critical areas of the containment structure, the RPE performed a detailed inspection/assessment of essentially all areas of the Farley Unit 1 containment surface, to determine the need for auxiliary lighting, scaffolding, binoculars, etc. This inspection/assessment has been documented and forms the bases of the demonstration that the Farley Nuclear Plant VT-3C examinations will meet the intent of the required IWL examinations. The findings of the inspection/ assessment for separate portions of the containment surface (e.g., individual auxiliary building rooms that adjoin containment and outside "daylight" surfaces) will establish the requirements for additional lighting, scaffolding, and any necessary viewing aids for those areas.

2.4.4 Proposed Alternate Examination

VT-3C examinations will be performed as required by IWL-2310 except that instead of using the minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height requirements specified in IWA-2210 and Table IWA-2210-1 for VT-3 examinations, the recommendations of the RPE for illumination and distance will be implemented.

2.4.5 SNC's Justification for Requesting Relief

Section XI relies on the knowledge and experience of the RPE as a key element for an IWL visual inspection program. Examining the concrete surfaces using distances and illumination requirements, established by a knowledgeable RPE, would provide for detection of flaws of sufficient size to assure that the structural integrity of the concrete containment is being maintained. Therefore, an acceptable level of quality and safety will be maintained and relief should be granted per 10 CFR 50.55a(a)(3)(i).

2.4.6 Staff Evaluation of RR-34

IWA-2210 and Table IWA-2210-1 require minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height for performing VT-3C examinations. Instead, SNC proposed to perform the VT-3C examinations required by IWL-2310 based on the minimum illumination and maximum distance (extended direct examination distance and decreased illumination requirements) recommended by the RPE.

Based on the Code requirements, performing VT-3C examinations on the concrete containment based on the requirements specified in IWA-2210 and Table IWA-2210-1 is to determine if the damage or degradation, including cracks, wear, corrosion, erosion or other physical damage, warrants additional evaluation or repair of the structure. Due to the nature of concrete, a concrete containment will have numerous, small "shrinkage-type" surface cracks or other imperfections that are not detrimental to the structural integrity of the containment. Applying Code requirements IWA-2210 and Table 2210-1 for identifying these insignificant "shrinkage-type cracks" or other imperfections is not necessary and could result in a large number of man-hours for erecting scaffolding, using lifts, evaluating insignificant indications, etc. In addition, performing examinations on concrete surfaces using distances and illumination requirements determined by a knowledgeable RPE will provide a reasonable degree of quality. Furthermore, as noted by SNC, the staff made changes to the requirements to allow the following: "When performing remotely the visual examinations required by Subsection IWE, the maximum direct distance specified in Table IWA-2210-1 may be extended and the minimum illumination requirements specified in Table IWA-2210-1 may be decreased provided that the conditions or indications for which the visual examination is performed can be detected at the chosen distance and illumination."

On the basis discussed above, the staff finds that the alternative examinations proposed by SNC provide an acceptable level of quality and safety and are therefore authorized pursuant to 10 CFR 50.55a(a)(3)(i).

2.5 Relief Request RR-35

SNC's letter of September 23, 1999, withdrew Relief Request RR35.

2.6 Relief Requests RR-36 through RR-39

The Idaho National Engineering and Environmental Laboratory (INEEL) helped the NRC staff review Relief Requests RR-36 through RR-39. The staff adopts the evaluations and recommendations for granting relief or authorizing alternatives contained in INEEL's Technical Evaluation Letter (TLR). For RR-36, use of Code Case N-546 is authorized until such time as the Code Case is published in a future revision of Regulatory Guide 1.147. At that time, if SNC intends to continue to implement this Code Case, SNC is to follow all provisions in Code Case N-546 with limitations or conditions specified in Regulatory Guide 1.147, if any.

For the Farley, Units 1 and 2, relief is granted from, or alternatives are authorized to, the testing requirements which have been determined to be impractical to perform, or where an alternative provides an acceptable level of quality and safety, or where compliance would result in a hardship or unusual difficulty without a compensating increase in quality or safety as shown in INEEL's TLR.

3.0 CONCLUSION

SNC's letter of February 8, 2000, withdrew Relief Requests 35 and 39. For Relief Requests RR-31 through RR-33 and RR-38, the staff concludes that compliance with the Code requirements would result in a hardship without a compensating increase in the level of quality and safety, and that SNC's proposed alternatives will provide reasonable assurance of containment pressure integrity and structural integrity. Therefore, these proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii). For Relief Requests RR-34 and RR-36, SNC's proposed alternatives will provide an acceptable level of quality and safety. Therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(i). INEEL's TLR evaluates Relief Requests RR-36 through RR-38. The staff has reviewed the TLR and concurs with the evaluations and recommendations for granting relief or authorizing alternatives. For RR-36, use of Code Case N-546 is authorized until such time as the Code Case is published in a future revision of Regulatory Guide 1.147. At that time, if SNC intends to continue to implement this Code Case, SNC is to follow all provisions in Code Case N-546 with limitations or conditions specified in Regulatory Guide 1.147, if any. Tables 1 and 2 in Attachment 1 summarize our relief request determinations.

The staff has determined that granting relief pursuant to 10 CFR 50.55a (g)(6)(i) and authorizing alternatives pursuant to 10 CFR 50.55a (a)(3)(i) or (a)(3)(ii) is authorized by law and will not endanger life or property, or the common defense and security and is otherwise in the public interest.

Attachments: 1) Relief Request Table Summaries
2) Technical Letter Report

Principal Contributors: T. Cheng
T. Scarbrough

Date: March 3, 2000

Table 1 — Summary of Relief Request Nos. 31 → 35

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

Relief Request No.	10 CFR 50.55a - ASME Code IWE/IWL Section	Issue	Relief Request Status
31	Table IWE-2500-1, E-D, E5.10 and E5.20	VT-3 Visual Examination of Seals and Gaskets	authorized (a)(3)(ii)
32	Table IWE-2500-1, E-G, E8.20	VT-1 Visual Examination and Torque-Tension Test of Pressure Retaining Bolting	authorized (a)(3)(ii)
33	IWE-2420(b) and (c)	Successive Examination Following Repairs	authorized (a)(3)(ii)
34	IWL-2310, IWA2210, and Table IWA-2210-1	Visual Examination (VT-3) and Personnel Qualification	authorized (a)(3)(i)
35	IWA-2310	VT-1, VT-2, VT-3, and VT-3C Examinations Related to IWE and IWL	withdrawn

FARLEY, UNITS 1 AND 2
Third 10-Year ISI Interval

Table 2 — Summary of Relief Request Nos. 36 → 39

Relief Request Number	INEEL TLR Sec.	System or Component	Exam. Category	Item No.	Issue	Required Method	SNC-Proposed Alternative	Relief Request Status
36	2.1	None	IWA-2313	None	Requires personnel performing examinations to be qualified by examination and certified in accordance with SNT-TC-1A. Level I and II personnel shall be re-certified by qualification examinations every 3 years. Level III personnel shall be re-certified by qualification examination every 5 years.	VT-2	Use Code Case N-546, *Alternative Requirements for Qualification of VT-2 Examination Personnel, Section XI, Division 1.*	Authorized (a)(3)(i)
37	2.2	Integral Attachments for Vessels	B-H	B8.20	Pressurizer skirt weld as defined by Figure IWB-2500-13, 14, and 15	Volumetric and Surface	Perform a "best effort" ultrasonic examination from the outside diameter for a limited portion of the Area C-D in addition to the surface examination of the outside diameter.	Granted (g)(6)(i)
38	2.3	Pressure Retaining Welds in Pressure Vessels	C-A	C1.20 & C1.30	Head-to-shell welds and tubesheet-to-shell welds	Volumetric	Perform a VT-2 visual examination as required by the Code.	Authorized (a)(3)(ii)
39	2.4	Nozzle Inner Radius Inspection for Class 1 Pressurizer and Steam Generator Nozzles			Nozzle Inner Radius Inspections for Class 1 Pressurizer and Steam Generator Nozzles		Code Case N-619, *Alternative Requirements for Nozzle Inner Radius Inspections for Class 1 Pressurizer and Steam Generator Nozzles*	Withdrawn in letter of February 8, 2000

TECHNICAL LETTER REPORT
ON THE THIRD 10-YEAR AND UPDATED INSERVICE INTERVAL
REQUESTS FOR RELIEF NOS. 31 THROUGH 39
FOR
SOUTHERN NUCLEAR OPERATING COMPANY
JOSEPH M. FARLEY UNITS 1 & 2
DOCKET NUMBERS: 50-348 & 50-364

1. INTRODUCTION

By letter dated March 3, 1999, the licensee, Southern Nuclear Operating Company, submitted Requests for Relief Nos. 31 through 39, seeking relief from the requirements of the ASME Code, Section XI, for the Farley, third 10-year inservice inspection (ISI) interval for Unit 1 and the updated ISI interval for Unit 2. In response to a Request for Additional Information (RAI), the licensee submitted clarification of several issues in a letter dated November 17, 1999. The licensee withdrew Request for Relief No. 39 in its letter dated February 8, 2000. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of Requests for Relief Nos. 36 through 39 is in the following section. Requests for Relief Nos. 31 through 35 are being evaluated by the NRC staff and will be reported under separate cover.

2. EVALUATION

The information provided by Southern Nuclear Operating Company in support of the requests for relief from Code requirements has been evaluated and the bases for disposition is documented below. The Code of record for the Joseph M. Farley Nuclear Plant, Unit 1 and Unit 2, third 10-year ISI interval, and updated ISI interval is the 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code. The third 10-year interval for Unit 1 began December 1, 1997, and will end on November 30, 2007. By a Safety Evaluation Report (SER) dated March 20, 1997, the NRC allowed Southern Nuclear Operating Company (SNC) to update the Unit 2 ISI Program approximately 44 months early to coincide with the required update of the Unit 1 program. The *Joseph M. Farley Nuclear Plant Unit 2 Updated Inservice Inspection Program* covers second and third interval examinations in the time frame from December 1, 1997 through November 30, 2007 (updated interval). Therefore, Unit 2 is currently in the second 10-year interval and the third 10-year interval will begin July 30, 2001.

2.1 Request for Relief 36, (Units 1 & 2) Use of Code Case N-546, *Alternative Requirements for Qualification of VT-2 Examination Personnel, Section XI, Division 1*

Code Requirement: ASME Code, Section XI, IWA-2313 requires personnel performing examinations to be qualified by examination and certified in accordance with SNT-TC-1A. Level I and II personnel shall be re-certified by qualification examinations every three years. Level III personnel shall be re-certified by qualification examination every five years.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(i) the licensee proposed the use of Code Case N-546, *Alternative Requirements for Qualification of VT-2 Examination Personnel*.

The Licensee Stated:

> "Code Case N-546 was published in Supplement 2 of the ASME Section XI Code, 1995 Edition. This Code Case provides alternative requirements to those of IWA-2300 for the qualification of VT-2 examination personnel. The ASME Section XI Code Committee determined that such training in accordance with this Code Case would ensure that an adequate level of quality and safety was being maintained. Therefore, the proposed alternative is justified per 10 CFR 50.55a(a)(3)(i). Code Case N-546 has not yet been endorsed by the NRC in Regulatory Guide 1.147; therefore, SNC is requesting to apply the Code Case via this relief request."

Licensee's Basis for Proposed Alternative (as stated):

> "Relief is requested from qualification by examination and certification in accordance with SNT-TC-1A for personnel performing leakage examinations (VT-2) of piping and components.
>
> The ASME Section XI Code Committee recognized that personnel that are performing examinations for evidence of leakage (VT-2) should not be required to satisfy the same stringent requirements for qualification and certification as personnel performing other types of examinations. Personnel performing leakage examinations should be familiar with the plant's specific configurations, systems, and procedures for VT-2 visual examination, and the Owner should be able to develop an acceptable program for training personnel to perform VT-2 leakage examinations.
>
> Plant Farley will implement a training program that satisfies the requirements of ASME Section XI Code Case N-546 for personnel to perform VT-2 leakage examinations. Personnel that are qualified and certified in accordance with ASME Section XI, IWA-2300 requirements may also be utilized to perform VT-2 leakage examinations; however, personnel that meet the requirements of the Owner's training requirements in accordance with Code Case N-546 will also be considered qualified to perform VT-2 examinations."

Evaluation: The Code requires that VT-2 visual examination personnel be qualified to levels of competency comparable to those identified in SNT-TC-1A. The Code also requires that examination personnel be qualified for near and far distance vision acuity.
In lieu of the Code requirements, the licensee proposed to implement Code Case N-546 for personnel performing VT-2 visual examinations, which includes the following requirements:

— At least 40 hours plant walkdown experience, such as that gained by licensed and non-licensed operators, local leak rate personnel, system engineers, and inspection and nondestructive examination personnel.
— At least four hours of training on Section XI requirements and plant specific procedures for VT-2 visual examination.
— Vision test requirements of IWA-2321, 1995 Edition.

The qualification requirements in Code Case N-546 are not significantly different from those for VT-2 visual examiner certification. Licensed and non-licensed operators, local leak rate personnel, system engineers, and inspection and nondestructive examination personnel typically have a sound working knowledge of plant components and piping layouts. This knowledge makes them acceptable candidates for performing VT-2 visual examinations.

In addition to meeting the requirements contained in Code Case N-546, the licensee has committed to the following conditions:

— Using procedural guidelines for consistent, quality VT-2 visual examinations.
— Verifying and maintaining records of the qualification of persons selected to perform VT-2 visual examinations.
— Implementing independent review and evaluation of detected leakage by persons other than those that performed the VT-2 visual examination.

Based on a review of Code Case N-546 and the additional commitments made by the licensee, the INEEL staff believes that the proposed alternative to the Code requirements will provide an acceptable level of quality and safety. Therefore, it is recommended that the licensee's request to implement Code Case N-546 be authorized pursuant to 10 CFR 50.55a(a)(3)(i). Use of this Code Case should be authorized until such time as the Code Case is published in a future revision of Regulatory Guide 1.147. At that time, if the licensee intends to continue to implement this Code Case, the licensee is to follow all provisions in Code Case N-546 with limitations or conditions specified in Regulatory Guide 1.147, if any.

2.2 <u>Request for Relief 37, (Units 1 & 2) Examination Category B-H, Item B8.20, Integral Attachments for Vessels</u>

<u>Code Requirement</u>: Examination Category B-H, Item B8.20 requires 100% volumetric or surface examination, as applicable, of the pressurizer skirt weld as defined by Figure IWB-2500-13, 14, and 15.

<u>Licensee's Code Relief Request</u>: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required examination of the inside surface area of the pressurizer skirt weld.

<u>Licensee's Basis for Relief Request</u> (as stated):

> "The heater penetrations of the bottom head restrict personnel access to the inside of the pressurizer support skirt. To obtain access to the bottom of the pressurizer would require a modified design and would be very expensive. The alternate examination proposed in Section V of this request will provide reasonable assurance of the continued structural integrity of this weld. Denial of this relief request would cause an excessive burden upon SNC, as modification of the pressurizer to perform this Code required examination is impractical; therefore, approval should be granted pursuant to 10 CFR 50.55a(g)(6)(i)."

<u>Licensee's Proposed Alternative Examination</u> (as stated):

> "In addition to the surface examination of the outside diameter, a "best effort" ultrasonic examination will be performed from the outside diameter for a limited portion of the "Area C-D."

<u>Evaluation</u>: For the joint configuration depicted in Figure IWB-2500-13, the Code requires 100% surface examination of the inside and outside surfaces of the pressurizer support skirt weld. Access to the inside surface of the weld is restricted due to interferences caused by pressurizer heater penetrations. To examine this weld from the inside, as required by the Code, the

pressurizer skirt would have to be redesigned and modified resulting in a considerable burden on the licensee. Examination of the inside surface of this weld is therefore impractical to perform.

The licensee proposes to examine the subject weld from the outside surface using the Code-required surface examination and a best effort volumetric examination, aimed at detecting inside surface-breaking flaws. These examinations should detect any significant areas of degradation, if present, and provide reasonable assurance of continued structural integrity. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.3 Request for Relief 38, (Units 1 & 2) Examination Category C-A, Items C1.20 & C1.30, Pressure Retaining Welds in Pressure Vessels and Examination Category F-B, Component Supports

Code Requirement: Examination Category C-A, Item C1.30 requires 100% volumetric examination, as defined by Figure IWC-2500-1& -2, for head-to-shell welds and tubesheet-to-shell welds each inspection interval. Examination Category F-B, requires a visual (VT-3) examination each inspection interval, as defined by Figure IWF-1300-1.

Licensee's Proposed Alternative: Pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee requested relief from the Code examination requirements for the regenerative heat exchanger head-to-shell welds, tubesheet-to-shell weld and component supports. A VT-2 visual examination will be performed as required by the Code.

Licensee's Basis for Relief Request (as stated):

"The Regenerative Heat Exchanger is a Class 2 heat exchanger that is designed to reduce unnecessary heat losses by heating the Reactor Coolant system (RCS) charging flow with the letdown flow. The 3" charging inlet/outlet lines are connected to the heat exchanger on the tube side, and the 3" letdown inlet/outlet lines are connected on the shell side. All of the 3" lines are exempt from non-destructive examinations per IWC-1220(c); however, the heat exchanger requires examination. The examination of the Regenerative Heat Exchanger is considered to constitute an unnecessary hardship without an associated increase in the level of quality and safety. This conclusion is based on the following:

1. Previous dose rate surveys and data for Unit 1 Regenerative Heat Exchanger examinations indicate a contact dose rate of approximately 2800 mrem/hr with a cumulative whole body dose of approximately 2500 mrem associated with the examination of one weld. The whole body cumulative dose to accomplish the required Code examinations for this heat exchanger will be in excess of 8 Rem. SNC considers this cumulative dose to constitute a hardship with no increase in the level of quality and safety for this system.

2. The Regenerative Heat Exchanger shell is fabricated from materials which restrict ultrasonic examination to a half-node technique. Using a half-node technique, the geometric configuration of the weld surface limits volumetric examinations to approximately half of the required examination volume. SNC considers this a minimal examination for the amount of corresponding dose.

3. The subject weld and piping supports are located on a component where all of the numerous welds and supports on the connecting lines are exempt from non-destructive examination. Not performing the examination of one weld and two supports in a system where almost all of the welds and supports do not require examination should have no effect on the level of quality and safety for this system."

> "A cumulative radiation dose in excess of 8 Rem for the required Code examinations, where the ultrasonic examination of the welds is limited to approximately one-half of the required volume, is considered a hardship by SNC. The level of quality and safety should not be decreased by deletion of the subject examinations, since it is located in piping exempt from nondestructive examinations. The pressure tests which are performed on this section of piping will provide adequate assurance of the integrity of the component and piping in the flow path; therefore, approval is requested per the requirements of 10 CFR 50.55a(a)(3)(ii)."

Evaluation: The Code requires 100% volumetric examination of the subject Class 2 Regenerative Heat Exchanger head-to-shell welds and tubesheet-to-shell welds, and a visual (VT-3) examination of the subject component supports. However, examination of these items is restricted due to extreme radiological conditions and component geometric configuration. The heat exchanger is fabricated from austenitic materials which restrict ultrasonic examination to half-node techniques. The licensee stated that when using a half-node technique, the geometric configuration of the weld surface limits the volumetric examination of the tubesheet-to-shell and vessel welds to an estimated 50% of the required volumes. Additionally, radiation dose rates are estimated to be in excess of 8 man-Rem to complete the examination of the subject welds and supports.

Based on the ALARA concerns surrounding the performance of these examinations, and the limited access to the subject weld, imposition of the Code requirements would result in a significant hardship. Further, the inlet and outlet piping to this heat exchanger is exempt from Code volumetric and surface examination requirements, based on size (3-inch NPS). Therefore, a compensating increase in the level of quality and safety would not be provided by requiring the licensee to examine the heat exchanger, yet exclude the connecting piping. The VT-2 visual examination for evidence of leakage, performed during the system hydrostatic test will provide reasonable assurance of the continued leakage integrity of the regenerative heat exchanger welds and supports. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that relief be authorized.

2.4 Request for Relief 39, (Units 1 & 2) Use of Code Case N-619, *Alternative Requirements for Nozzle Inner Radius Inspections for Class 1 Pressurizer and Steam Generator Nozzles*

The licensee withdrew Request for Relief 39 in its letter dated February 8, 2000.

3. CONCLUSION

The INEEL staff has reviewed the licensee's submittal and concluded that for Request for Relief RR-36, the licensee's proposed alternative to the Code requirements provides an acceptable level of quality and safety. Therefore, it is recommended that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i). For Request for Relief RR-37, it is concluded that the Code requirements are impractical to perform. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i). For Request for Relief RR-38, it is concluded that the Code requirements would result in a hardship without a compensating increase in the level of quality and safety. Therefore, it is recommended that the proposed alternative be authorized pursuant to 10 CFR 50.55a(3)(ii). Request for Relief RR-39 was withdrawn by the licensee's letter dated February 8, 2000.