March 9, 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: APPROVAL OF PUMP AND VALVE INSERVICE TESTING PROGRAM RELIEF REQUESTS (TAC NOS. MA5135 AND MA5136)

Dear Mr. Morey:

Your letter of April 1, 1999, submitted inservice testing program relief requests for Farley Nuclear Plant, Units 1 and 2. We discussed these relief requests with your staff on May 25, 1999. Your letter of August 31, 1999, provided additional information and revised your relief requests in response to our questions and comments.

We have completed our review of your revised relief requests and authorize the proposed alternatives pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(ii) on the basis that imposing the Code requirements results in a hardship without a compensating increase in the level of quality and safety, and your proposed testing provides reasonable assurance that the components are operationally ready. We conclude that it is burdensome to disassemble and inspect each valve during every refueling outage, and that the proposed alternative meets the guidance of Generic Letter 89-04 and NUREG-1482 and provides reasonable assurance of valve operability.

Our safety evaluation is enclosed. Please contact me 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: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO INSERVICE TESTING PROGRAM RELIEF REQUESTS FOR

SOUTHERN NUCLEAR OPERATING COMPANY, INC., ET AL.

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-348 AND 50-364

1.0 INTRODUCTION

The *Code of Federal Regulations* (10 CFR) Section 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME *Boiler and Pressure Vessel Code* (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to Sections (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that:

(1) the proposed alternatives provide an acceptable level of quality and safety,
(2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, or
(3) conformance is impractical for its facility

Section 50.55a allows the Commission to authorize alternatives and grant relief from ASME Code requirements upon making the necessary findings. Guidance related to developing and implementing IST programs is given in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," issued April 3, 1989, and Supplement 1 to the GL issued April 4, 1995. Also see NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," and NUREG/CR-6396, "Examples, Clarifications, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements."

The 1989 Edition of the ASME Code is the latest edition incorporated by reference in Paragraph (b) of Section 50.55a. Subsection IWV of the 1989 Edition, which gives the requirements for IST of valves, references Part 10 of the American National Standards Institute/ASME Operations and Maintenance Standards (OM-10) as the rules for valve IST. OM-10 replaces specific requirements in previous editions of Section XI, Subsection IWV, of the ASME Code. Subsection IWP of the 1989 Edition, which gives the requirements for pump IST, references Part 6 of the American National Standards Institute/ASME Operations and Maintenance Standards (OM-6) as the rules for pump IST. OM-6 replaces specific requirements in previous editions of Section XI, Subsection IWP, of the ASME Code.

Southern Nuclear Operating Company's (SNC's) IST program covers the third 10-year IST interval for Farley Nuclear Plant (FNP) Unit 1, from December 1, 1997, to November 30, 2007. For FNP Unit 2, the IST program covers the second 10-year interval from December 1, 1997, to July 30, 2001, and a portion of the third 10-year interval from August 1 to November 30, 2007. The NRC's letter of March 20, 1997, approved using ASME OM Code-1990, Subsection ISTB for Pumps and Subsection ISTC for Valves for both FNP Unit 1 and 2 IST programs.

SNC's letter on April 1, 1999, submitted two valve relief requests, one for FNP Unit 1 and the other one for FNP Unit 2. The staff and SNC discussed these relief requests on May 25, 1999. In response to the staff's questions and comments, SNC provided additional information and revised the relief requests in their letter of August 31, 1999. The staff has completed its review of the revised relief requests and provides the following evaluation.

2.0 VALVE RELIEF REQUESTS Q1P16-RR-V-5 AND Q2P16-RR-V-5

Q1P16-RR-V5 applies to FNP Unit 1 valve Q1P16V0661, and Q2P16-RR-V-5 applies to FNP Unit 2 valve Q2P16V0661. SNC requests relief from disassembling the check valves every refueling outage in accordance with ISTC 4.5.4(c). SNC proposes disassembling Q1P16V0661 every other Unit 1 refueling outage and Q2P16V0661 every other Unit 2 refueling outage to test the valves on a sampling basis.

2.1 SNC's Basis for the Relief Request

SNC states:

> There are no system design provisions to verify valve reverse flow closure quarterly, at cold shutdown or refueling outage. Therefore, per ISTC 4.5.4(c) these valves will be disassembled during refueling outages to verify operability. No relief is required for these valves per ISTC 4.5.4 (c) if each valve is disassembled every refueling outage. SNC is proposing to group these valves in a sampling disassembly/inspection group and disassemble Q1P16V0661 every other Unit 1 refueling outage and Q2P16V0661 every other Unit 2 refueling outage.
>
> The valves within this group are of the same design (manufacturer, size, model number, and material of construction) and have the same service conditions including valve orientation. These valves meet the guidance of NRC Generic Letter 89-04, Position 2 for valve grouping for purposes of implementing a disassembly/inspection sampling plan. In NUREG-1482, Appendix G, Comments on Section 4, "Supplemental Guidance on Inservice Testing of Valves," Comment and Response 4.1-3, the NRC has indicated that groups of check valves for disassembly and inspection from multiple units of like design and construction may be combined as stated below:
>
> > "It is acceptable to group valves from multiple units if two units are "identical," if the units will be subjected to the same service conditions, and if the valves otherwise meet the grouping criteria."

The burden justification for the proposed alternate testing sampling plan is detailed below:

The inspection history of valves Q1P16V0661 & Q2P16V0661 suggests there is no need for disassembly/inspection each outage, thus any additional expense in doing so would be an unnecessary burden. The past inspections of these valves dating back to 1984 have not detected any unsatisfactory conditions. On average, the disassembly/inspection history of these valves requires 6 mechanic man-hours in the plant. Additional costs associated with planning, approximately 50 man-hours for draining of systems in preparation for valve disassembly and inspection, scheduling, supervision, documentation, etc. are also required for this task.

In addition to incurring these unnecessary costs, disassembling both of these valves every outage will decrease diesel generator availability thus increasing the risk of core damage. The diesel generator system is composed of five generators. The service water cooling supply to each generator is train oriented. Thus each generator gets its cooling from either the “A” train or "B" train service water supply. The proposed disassembly/inspection plan for valve Q1P16V0661 (or Q2P16V0661) will ensure that its disassembly/inspection will be performed at the same time that the other "A" train service water supply check valve, Q1P16V0660 (or Q2P16V0660) is disassembled/inspected. The "B" train check valve, Q1P16V0659 (or Q2P16V0659), will be disassembled/inspected on the alternating outages. This disassembly schedule requires that only one train of the diesel generators be out of service during any outage.

Without a sampling disassembly/inspection plan, FNP will be increasing risk to the core without a commensurate gain in the reliability of the valves. This is counter to the philosophy of 10CFR50.65 of balancing reliability and availability which states that "Adjustments shall be made where necessary to ensure that the objective of preventing failures of structures, systems, and components through maintenance is appropriately balanced against the objective of minimizing unavailability of structures, systems, and components due to monitoring or preventative maintenance."

SNC has considered the use of non-intrusive techniques for these valves. These valves are part of both the INPO [Institute of Nuclear Power Operations] SOER [Significant Operating Experience Report] 86-03 Check Valve Failures or Degradation program and the IST program. In order to minimize the cost and burden of testing, the testing technique employed for these valves must meet the requirements of both programs. To meet the intent of the SOER 86-03 program, a non-intrusive technique must provide a reliable indication of the valve's internal condition in addition to a full open or full closed verification that is required for IST purposes. Results from non-intrusive check valve testing done at FNP have not been conclusive in ascertaining the internal condition or degree of degradation. These inconclusive results make the use of the non-intrusive techniques unattractive compared to the disassembly and inspection option that meets the requirements of both the SOER and IST programs. SNC has been

actively following and participating in non-intrusive check valve technology since 1990 and will continue to do so with a goal of reducing the number of valves disassembled.

2.2 Alternative Testing

SNC states:

> Q1P16V0661 will be disassembled/inspected every other Unit 1 refueling outage and Q2P16V0661 every other Unit 2 refueling outage. The valve internals will be verified to be structurally sound (no loose or corroded parts) and the disk will be manually exercised to verify full stroke capability. The valve will be part stroked with flow after reassembly. The necessary valve obturator movement, verifying part stroke exercising, will be confirmed by changes in system pressure, flow rate, level, temperature, seat leakage testing or other positive means or through the use of ultrasonic (or similar) flow measuring devices. If a problem is determined while disassembling and inspecting a valve, an evaluation will be performed to determine if there is a generic issue involved. As part of this evaluation, the results of the disassembly and inspection results from the same unit's V0660 valve will be reviewed. (The V0660 and V0661 valves from the same unit should always be scheduled for disassembly/inspection during the same refueling outage). If a generic problem is determined to exist, SNC will implement the guidance set forth in NUREG-1482, Appendix G, Comments on Section 4, "Supplemental Guidance on Inservice Testing of Valves," Comment and Response 4.1-3 and disassemble/inspect the V0661 valve from the other unit at that unit's next refueling outage.

3.0 EVALUATION

Paragraph ISTC 4.5.2 (d) of the ASME OM Code requires utilities to perform valve full-stroke exercising during refueling outages if valve exercising is not practicable during plant operation or cold shutdowns. Paragraph ISTC 4.5.4(c) allows disassembly every refueling outage to verify operability of check valves. However, SNC proposes to test these valves on a sampling basis and to disassemble Q1P16V0661 every other Unit 1 refueling outage and Q2P16V0661 every other Unit 2 refueling outage.

GL 89-04, Position 2, states that valve disassembly and inspection can be used as a positive means to determine that a valve disk will full-stroke exercise open or to verify closure capability. It further states that where a utility determines that it is burdensome to disassemble and inspect all applicable valves each refueling outage, the utility may employ a sample disassembly and inspection plan for groups of identical valves in a similar application. Guidance for grouping of the valves is such that each valve is disassembled and inspected at least once every 6 years, with a minimum of one valve disassembled and inspected each refueling outage. NUREG-1482, Appendix G, (page G-29) also indicates that it is acceptable to group valves from multiple units if the following conditions apply:

- the two units are identical,
- the units will be subjected to the same service conditions, and
- the valves otherwise meet the grouping criteria

SNC's proposal of grouping the affected valves from Units 1 and 2 at the same site meets NUREG 1482 guidance and therefore is acceptable. For a group of two valves in the relief request, the proposal to test one valve at every other unit refueling outage would extend the test interval for each valve to no more than 4 years, which meets the guidance of GL 89-04, Position 2.

The ASME OM Code allows disassembly as an acceptable means of inspecting check valves at each refueling outage. GL 89-04, Position 2 allows extending a test interval up to 6 years where the utility determines that it is burdensome to test all applicable valves at each refueling outage. SNC states that there are no system design provisions to verify reverse flow closure quarterly, at cold shutdown, or during a refueling outage. Therefore, per ISTC 4.5.4(c) these valves will be disassembled during refueling outage to verify operability. SNC also states that on average, disassembling and inspecting these valves require 6 man-hours in the plant and approximately 50 man-hours to drain the systems in preparation for the test. Additional costs associated with planning, scheduling, supervision, documentation, etc. are also required.

If SNC finds a generic problem for one valve in one unit, SNC proposes to inspect the valve in the other unit at its next refueling outage in lieu of inspecting all other valves in the group at the same refueling outage. SNC's proposal is consistent with NUREG-1482 guidance (page G-29) that states if a generic problem is found while disassembling and inspecting valves during a fueling outage on one unit, all valves in the group in that unit must be inspected during the refueling outage, and the valves in the group in the other unit must be inspected at the next refueling outage for that unit. For two valves in the group, SNC's proposal to disassemble Q1P16V0661 every other Unit 1 refueling outage and Q2P16V0661 every other Unit 2 refueling outage meets the above guidance of NUREG-1482 and is thus acceptable.

4.0 CONCLUSION

SNC's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that imposing the Code requirements results in a hardship without a compensating increase in the level of quality and safety and SNC's proposed testing provides reasonable assurance that the components are operationally ready. The staff has concluded it is burdensome to disassemble and inspect each valve during every refueling outage, and that the proposed alternative meets the guidance of GL 89-04 and NUREG-1482 and provides reasonable assurance of valve operability.

Principal Contributor: J. Huang

Date: March 9, 2000

Joseph M. Farley Nuclear Plant

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