

February 13, 2008

Mr. J. Randy Johnson  
Vice President – Farley  
Joseph M. Farley Nuclear Plant  
7388 North State Highway 95  
Columbia, AL 36319

SUBJECT: SAFETY EVALUATION ON RELIEF REQUEST RR-60 FROM ASME CODE  
REQUIREMENTS REGARDING PRESSURE TESTING FOR JOSEPH M  
FARLEY NUCLEAR PLANT UNIT 1 (TAC NO. MD6302)

Dear Mr. Johnson:

The Nuclear Regulatory Commission Staff (NRC) has evaluated the information provided in a letter from Southern Nuclear Company, Inc., (the licensee) dated October 10, 2007. This letter requests approval of Relief Request RR-60 (RR-60), which requests relief from the requirement to perform a hydrostatic system leakage test of approximately 110 feet of 2-inch Chemical Volume and Control System piping. Through RR-60, the licensee proposed to defer the testing requirement for one operational fuel cycle.

The NRC staff has completed its review and evaluation of RR-60, and as discussed in the enclosed safety evaluation, concludes that the licensee has demonstrated hardship, and the proposed alternative provides reasonable assurance of structural integrity of the pipe segment for the deferred time period. Therefore, pursuant to Title 10 of the *Code of Federal Regulations* 50.55a(a)(3)(ii), the NRC authorizes RR-60.

On November 1, 2007, verbal authorization was given to the licensee to use RR-60. The enclosed safety evaluation provides the documented basis for authorizing relief.

If you have any questions, please feel free to contact me.

Sincerely,

**/RA/**

Melanie C. Wong, Acting Branch Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-348

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST RR-60

DEFERRAL OF VT-2 EXAMINATION OF PIPING SEGMENT AT NORMAL OPERATING

PRESSURE

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 1

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

DOCKET NUMBER 50-348

1.0 INTRODUCTION

By letter dated October 10, 2007, Southern Nuclear Operating Company, Inc., the licensee, requested U.S. Nuclear Regulatory Commission (NRC) approval to defer the hydrostatic test of an American Society of Mechanical Engineer's (ASME) Code Class 1 piping segment that is part of the chemical and volume control system. The licensee, through Relief Request RR-60 (RR-60), proposes to defer the requirement to perform a system pressure test on this piping segment to allow time to develop an effective test procedure with as low as reasonably achievable (ALARA) radiological dose considerations or development of a technical basis position for further deferral.

2.0 REGULATORY EVALUATION

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) must meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination 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 ISI code of record for Joseph M. Farley Nuclear Plant, Unit 1, (Farley1) third 10-year ISI interval, which started in December 1997 and is scheduled to be complete in November 2007, is the 1998 Edition of Section XI of the ASME Code.

Pursuant to 10 CFR 50.55a(a)(3), alternatives to requirements may be authorized by the NRC if the licensee demonstrates that: (i) the proposed alternatives 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.

Enclosure

The licensee sets forth RR-60 as a proposed alternative as complying with ASME Code requirements would result in hardship without a compensating increase in the level of quality and safety. 10 CFR 50.55a(a)(3)(ii) provides the regulatory basis to evaluate the proposed modification.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Requirements For Which Relief is Requested

ASME Code inspection requirements under Table IWB-2500-1, Items B15.51 and B15.71 and under Code Case N-498-4 require a pressure test of the entire ASME Code Class 1 system boundary, once every 10 years, at normal operating pressure (NOP), accompanied by visual examination (VT-2) after a hold time of 10 minutes for non-insulated components, and 4 hours for insulated components.

#### 3.2 Components for Which Relief is Requested

An approximately 110-foot long, 2-inch (2") Chemical Volume and Control System (CVCS) Auxiliary Pressurizer Spray Line piping segment of the reactor coolant pressure boundary (RCPB) between air operated valve (AOV) Q1E21V245 and the auxiliary pressurizer spray nozzle.

#### 3.3 Licensee's Proposed Alternative

The licensee, through RR-60, proposes a one cycle (18-month) deferral of the VT-2 examination of the above piping segment at reactor coolant system (RCS) NOP due to hardship. The licensee will perform additional research and submit an updated relief request, if necessary, at least 1 year prior to the start of the next Farley1 Refueling Outage (1R22) in March 2009. During the Refueling Outage 1R21 in November 2007, the licensee will visually examine the subject piping segment for evidence of leakage from the previous cycle of operation.

#### 3.4 Licensee's Basis

The line in question comes off of the CVCS Regenerative Heat Exchanger. The complete piping line is a 2" branch line that goes to an air operated valve, AOV Q1E21V245, on to 2" check valve Q1E21V109, then through a 2" by 4" pipe expander, ending at the auxiliary Pressurizer spray nozzle. This flow path is used to provide an alternative pressurizer pressure control method during off normal conditions, such as when no reactor coolant pumps are running. CVCS is continuously in service during normal plant operation; therefore the piping up to valve Q1E21V245 is at a pressure greater than or equal to RCS pressure. However, the 2" pipe segment between AOV Q1E21V245 and check valve Q1E21V109 cannot be pressurized without impacting proper RCS pressure control.

AOV Q1E21V245 is normally closed and fails closed and check valve Q1E21V109 is maintained closed during normal operation due to RCS pressure on the down stream side. Therefore, a leak or break in the piping segment between the two valves would be limited to only that allowed by nominal seat leakage from either or both valves. This line segment was not selected for risk informed inservice inspection of welds due to its low safety significance. The plant's probabilistic risk assessment model takes no credit for auxiliary spray. Surface

examinations, in accordance with ASME Section XI, Examination Category B-J were performed on ten welds in the associated piping during the 3rd period of both the 1st and 2nd ISI intervals. All surface examinations were satisfactory.

Currently the only practicable way to pressurize the piping segment between check valve Q1E21V109 and AOV Q1E21V245 to nominal RCS pressure would require disassembly of check valve Q1E21V109, removal of the valve disc, reassembly of check valve, pressurize RCS, hold for 4 hours and then perform the VT-2 examination. This method would provide compliance with the ASME Code and Code Case, but results in the following hardships.

1. Valve Q1E21V109 is located inside the containment shield wall in close proximity to RCS piping and the Pressurizer. This area is considered a High Radiation Area and maintaining personnel dose for ALARA would be of concern. Disassembly of this valve would subject personnel not only to general area radiation dose rates but also very high radiation doses once the valve is opened. The licensee estimates the total dose to be 2.4 person-[roentgen equivalent man] rem for the disassembly and reassembly of this check valve. Once the system is opened, personnel contamination is also of concern, since this valve provides a RCS boundary.
2. The plant would not be able to progress directly from pressure test completion into plant startup due to the required RCS depressurization and cooldown to enable disassembly/ reassembly of check valve Q1E21V109 prior to startup. It is estimated that this iteration would require approximately 96 hours. Valve Q1E21V109 would then require a post reassembly VT-2 examination at normal operating pressure. All this would be critical path time which would extend the refueling outage duration.
3. Check valve disassembly/reassembly increases the opportunity for human error and mechanical damage resulting in unacceptable RCS pressure boundary integrity and valve operation.
4. Q1E21V109 is a V-Type, socket welded, check valve with a seal weld at the cover to body connection. Disassembly requires grinding away the seal weld which creates additional opportunities for valve damage. Reassembly requires machining the cover to body surface area to allow for a quality seal weld to prevent leakage during operation.

### 3.5 Staff Evaluation

By letter dated August 3, 2007, the licensee requested NRC approval to perform a VT-2 examination of the piping segment at potentially zero nominal pressure. The staff found insufficient technical basis was provided by the licensee to authorize the VT-2 examination under zero nominal pressure in lieu of the ASME Code requirement of normal operating pressure conditions.

During several telecommunications between the staff and licensee personnel, the current options identified by the licensee to perform the required inspection during the current ISI interval were limited without resulting in undue hardships as identified by the licensee in

Section 3.4. However, there was insufficient time to explore other possibilities which, if given adequate time to develop and plan, could provide a more effective pressure test of this piping segment. Additional time could also allow the licensee to develop a sufficient basis to support the August 3, 2007 proposed alternative. Therefore, by letter dated October 10, 2007, the licensee revised the relief request to propose a deferral request for one operational cycle of the required pressure test on the piping segment.

The satisfactory surface examinations performed on ten welds in the associated piping during the 3rd period of both the 1st and 2nd ISI intervals and the licensee's proposed alternative visual inspection for indications of leakage from the previous operational cycle during the November 2007 refueling outage provide reasonable assurance of structural integrity of the piping segment currently. A review of operational experience has not identified a failure of similar line segments at other facilities. Therefore the proposed alternative to allow deferral of the required VT-2 examination under NOP conditions for one cycle of operation provides a reasonable basis for assurance of structural integrity through this time period of deferral.

The licensee's estimate of a total dose of 2.4 person-rem for the disassembly and reassembly of the check valve and the contamination potential when opening the reactor coolant system pressure boundary were considered by the staff to be significant hardship concerns if the licensee were to perform the pressure test in the November 2007 refueling outage. Therefore, given the staff's finding of a reasonable basis for assurance of structural integrity, the licensee has demonstrated sufficient hardship through the consideration of radiological dose and contamination considerations such that compliance with the ASME Code required inspection would result in hardship without increase in the level of quality or safety.

#### 4.0 CONCLUSIONS

The staff has reviewed the licensee's October 10, 2007, submittal and determines that the proposed alternative to perform a visual examination for indications of leakage from the past outage and deferral of the VT-2 inspection at NOP for the subject piping for one cycle of operation provides reasonable assurance of structural integrity. Further the staff finds that performance of the VT-2 inspection in the 1R21 refueling outage would result in hardship without a compensating increase in the level of quality and safety. Deferral of the requirement will extend the ISI interval for the subject piping until the next refueling outage and allow the licensee sufficient time to either reduce this hardship or provide a longer term proposed alternative for this required inspection. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC authorizes the use of RR-60. This authorization is applicable until the 1R22 refueling outage at Farley1 which is scheduled to occur in March 2009.

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

Principal Contributor: T. Chan

Date: February 13, 2008

Joseph M. Farley Nuclear Plant, Units 1 & 2

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