Southern Nuclear
Operating Company, Inc.

SOUTHERN COMPANY
Energy to Serve Your World

January 4, 2010

Docket No.: 50-364

NL-09-2057

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

Joseph M. Farley Nuclear Plant-Unit 2
FNP-ISI-ALT-09, Version 1.0, Proposed Alternative in
Accordance With 10 CFR 50.55a(a)(3)(i)

Ladies and Gentlemen:

Pursuant to 10 CFR 50.55a, Southern Nuclear Operating Company (SNC) hereby requests NRC approval of proposed Alternative FNP-ISI-ALT-09, which proposes to extend the ISI interval for reactor vessel welds (Examination Category B-A) and nozzle-to-vessel welds (Examination Category B-D) from 10 years to 20 years. The proposed alternative is applicable for the 4th Inservice Inspection Interval.

The details of the 10 CFR 50.55a request are contained in the enclosure. Approval is requested by December 27, 2010. The requested approval date would allow SNC the opportunity to implement a contingency plan to perform required RPV examination during the Unit 2 fall 2011 refueling outage (2R21), if necessary.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

Mark J Ajluni

M. J. Ajluni
Manager - Nuclear Licensing

MJA/TAH/phr

Enclosure 1: Proposed Alternative FNP-ISI-ALT-09 Version 1.0,
in Accordance with 10 CFR 50.55a(a)(3)(i)

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. J. R. Johnson, Vice President – Farley
Ms. P. M. Marino, Vice President – Engineering
RTYPE: CFA04.054

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Farley
Mr. E. L. Crowe, Senior Resident Inspector – Farley

Joseph M. Farley Nuclear Plant – Unit 2
Proposed Alternative for the Fourth ISI Interval

Enclosure 1

Proposed Alternative FNP-ISI-ALT-09 Version 1.0,
in Accordance with 10 CFR 50.55a(a)(3)(i)

Enclosure 1

Proposed Alternative FNP-ISI-ALT-09 Version 1.0,
in Accordance with 10 CFR 50.55a(a)(3)(i)

Plant Site-Unit:	Joseph M. Farley Nuclear Plant (FNP) - Unit 2.
Interval Dates:	4th Inservice Inspection (ISI) Interval – December 1, 2007 through November 30, 2017.
Requested Date for Approval:	Approval is requested by December 27, 2010.
ASME Code Components Affected:	The affected components are Examination Category B-A, Items B1.11, B1.12, B1.21 and B1.30 reactor vessel (RV) shell welds, and Examination Category B-D, Item B3.90 RV nozzle welds. The specific components are provided in Table 4.
Applicable Code Edition and Addenda:	The applicable Code edition and addenda (for the 4th ISI interval) is ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant components," 2001 Edition through the 2003 addenda.
Applicable Code Requirements:	Table IWB-2500-1 requires volumetric examination of the affected reactor vessel (RV) components once each ten year interval.
Reason for Request:	The Westinghouse pilot plant RV analysis defined in WCAP-16168-NP-A, Revision 2 utilizes probabilistic fracture mechanics and risk analysis methods to justify extending the ISI interval for reactor vessel welds (Examination Category B-A) and nozzle-to-vessel welds (Examination Category B-D) from 10 years to 20 years. An analysis has been performed showing that FNP - Unit 2, which is a Westinghouse 3-Loop plant, is bounded by the pilot plant parameters defined in WCAP-16168-NP-A, Revision 2. Therefore, Southern Nuclear Operating Company (SNC) is requesting approval of this alternative to allow the use of the ISI interval extension for the affected FNP - Unit 2 components.
Proposed Alternative:	SNC is requesting a one-time extension of the ISI interval from 10 years to 20 years for FNP Unit – 2 Examination Category B-A welds and Examination Category B-D nozzle-to-vessel welds. Specifically, this proposed alternative would permit the deferral of the ASME Code required Examination Category B-A and B-D volumetric examinations currently scheduled for 2010 (1st period of 4th interval) until 2020 plus or minus one refueling cycle (1st period of 5th interval). The required examinations would subsequently be performed using the Section XI Code in effect for the 5th interval.

Enclosure 1

Proposed Alternative FNP-ISI-ALT-09 Version 1.0,
in Accordance with 10 CFR 50.55a(a)(3)(i)

Basis for Use:	The methodology used to demonstrate the acceptability of extending the inspection intervals for Examination Category B-A and B-D components is contained in WCAP-16168-NP-A, Revision 2 (Reference 4). This methodology was used to develop a pilot plant risk analysis for Westinghouse (W), Combustion Engineering (CE), and Babcock and Wilcox (B&W) RV designs and is an extension of the work that was performed as part of the NRC PTS Risk Re-Evaluation (Reference 5). The WCAP used the estimated through wall cracking frequency (TWCF) as a measure of the risk of RV failure, and it was demonstrated that the inspection interval for the affected components can be extended from 10 years to 20 years while meeting the change in risk guidelines found in Regulatory Guide 1.174 (Reference 3). This WCAP was subsequently approved by the NRC in a May 8, 2008 safety evaluation. Section 3.4 of the safety evaluation provides the requirements for a utility to submit an alternative in accordance with 10 CFR 50.55a(a)(3)(i) to use the WCAP for a plant specific evaluation. These requirements are addressed below: 1. Licensees must demonstrate that the embrittlement of their RV is within the envelope used in the supporting analyses. A plant specific analysis was performed that demonstrated that FNP – Unit 2 RV parameters are bounded by corresponding pilot plant parameters. The critical parameters are identified in Table 1, and Table 3 provides detailed information relative to the calculation of the TWCF. 2. Licensees must report whether the frequency of the limiting design basis transients during prior operation are less than the frequency identified in the PWROG fatigue analysis. As shown in Table 1, the frequency of the FNP – Unit 2 limiting design basis transients are bounded by the frequency identified in the PWROG fatigue analysis. 3. Licensees must report the results of prior ISI of RV welds and the proposed schedule for the next 20 year ISI interval. The results of the previous RV inspections for FNP Unit – 2 are provided in Table 2. This information confirms that satisfactory examinations have been performed on the FNP - Unit 2 RV. 4. In the request for an alternative, each licensee shall identify the years in which the future inspections will be performed. The FNP – Unit 2 RV examinations currently scheduled for 2010 will be deferred until 2020 plus or minus one refueling cycle. The dates provided must be within plus or minus one refueling cycle of the date identified in PWROG letter OG-06-356, dated October 31, 2006 (Reference 2). The intent of the schedule identified in PWROG letter OG-06-356 is to provide for a sampling of inspections in the PWR fleet over the 20 year interval such that any emerging degradation mechanisms are detected in a timely manner.

	The dates that are proposed for Farley Unit 2 in this request for alternative are in excess of one refueling cycle from the dates identified in PWROG letter OG-06-356. These dates will result in one fewer examination performed in 2010 and one additional exam being performed in 2020. This change in dates will still provide for at least one inspection each year and will have a negligible impact on the ability of the schedule to provide for early detection of emerging degradation mechanisms. Furthermore, the PWROG has submitted to the NRC a revised fleet implementation schedule in OG-09-454, dated December 1, 2009 (Reference 11). This revised schedule meets the intent of the schedule in OG-06-356 and reflects the dates requested for FNP – Unit 2 in this alternative, along with changes in implementation dates for other plants in the PWR fleet. The examinations for FNP – Unit 2 will be performed within plus or minus one refueling cycle of the dates identified in this revised fleet implementation schedule. The revised schedule of ongoing examinations will ensure that any emerging degradation mechanism will be detected in a timely manner. 5. Within one year of completing each of the ASME Code, Section XI, Category B-A and B-D RV weld inspections required in the proposed alternative, the licensee must provide the information and analyses requested in Section (e) of the final 10 CFR 50.61a proposed rulemaking. Licensees that do not implement 10 CFR 50.61a must amend their licenses to require that the required information and analyses be submitted to the NRC. SNC will not implement these requirements. This position is based on the June 12, 2009 letter from the NRC to Entergy Operations for Waterford – 3 (ADAMS Accession Nos. ML091600132 and ML091600158) where the NRC indicates that the NRC will only grant ISI interval extensions for the subject components on an interval-by-interval basis for a period up to 20 years. Accordingly, licensees will have to submit subsequent requested alternatives, for NRC review and approval, to extend each following ISI interval from 10 years to 20 years, as needed. Therefore, the NRC concluded that a license condition to address the evaluation of future ISI data is no longer necessary and; therefore, a license amendment is no longer required. This position has also been taken by the PWROG as shown in OG-09-454, dated December 1, 2009 (Reference 11). FNP-Unit 2 is bounded by the pilot plant application and the total TWCF for FNP – Unit 2 was calculated as 2.61E-10 which is negligible; therefore, the use of this proposed alternative will provide an acceptable level of quality and safety. Therefore, it is requested that the NRC authorize this proposed alternative in accordance with 10 CFR 50.55a(a)(3)(i).
Duration of Proposed Alternative:	The 4th ISI Interval.

Enclosure 1

**Proposed Alternative FNP-ISI-ALT-09 Version 1.0,
in Accordance with 10 CFR 50.55a(a)(3)(i)**

Precedents:	1. Donald C. Cook Nuclear Plant, Unit 2 – Evaluation of Relief Request (ISIR-29) to Extend the Third 10-Year Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC MD9934) Donald C. Cook Nuclear power Plant, Unit 2 – NRC Safety Evaluation Report dated June 8, 2009 (ML091260163). 2. Safety Evaluation for Relief Requests ISI-090 & 021 Reactor Vessel Weld Examination Extension – Calvert Cliffs Nuclear Power Plant, Unit 2 (TAC Nos. MD9773 and MD9774). Calvert Cliffs Nuclear Power Plant Unit No. 2 – NRC Safety Evaluation Report dated April 8, 2009 (ML090920077). 3. Palisades Plant – Evaluation of Relief Request to Extend the Third 10-Year Inservice Inspection Interval For Reactor Weld Examinations (TAC NO. MD9265) Palisades Plant – NRC Safety Evaluation Report dated February 11, 2009 (ML 090120896). 4. R.E. Ginna Nuclear Power Plant: Safety Evaluation for Relief Request N0. 18, Reactor Vessel Weld Examination Extension (TAC NO. MD9962) – R.E. Ginna plant – NRC Safety Evaluation Report dated July 31, 2009 ML092080229. 5. Kalyanam, N., NRC, to Vice President, Entergy Operations, "Waterford Steam Electric Station, Unit 3 – Withdrawal of an Amendment Request (TAC NO. MD9669)," dated June 12, 2009 (ML091600132 and ML091600158)
References:	1. ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with the 1989 Addenda up to and including the 2004 Edition with the 2005 Addenda, American Society of Mechanical Engineers, New York. 2. OG-06-356, "Plan for Plant Specific Implementation of Extended Inservice Inspection Interval per WCAP-16168-NP, Revision 1, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval." MUHP 5097-99, Task 2059," October 31, 2006. 3. NRC Regulatory Guide 1.174, Revision 1, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," November 2002. 4. WCAP-16168-NP-A, Revision 2, "Risk-Informed Extension of Reactor Vessel In-Service Inspection Interval," June 2008. 5. NUREG-1874, "Recommended Screening Limits for Pressurized Thermal Shock," March, 2007. 6. NRC Letter Report, "Generalization of Plant-Specific Pressurized Thermal Shock (PTS) Risk Results to Additional Plants," December 14, 2004. 7. NRC Regulatory Guide 1.150, Revision 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," February 1983. 8. NRC Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor

	Vessel Materials," May 1988. 9. FNP FSAR page 3A-1.43. 10. WCAP-17123-NP, Revision 0, J. M. Farley Heatup and Cooldown Curves for Normal Operation, October 2009. 11. OG-09-454, "Revised Plan for Plant Specific Implementation of Extended Inservice Inspection Interval per WCAP-16168-NP, Revision 1, 'Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval' PA-MSC-0120.
Status:	Awaiting NRC approval.

Enclosure 1

Proposed Alternative FNP-ISI-ALT-09 Version 1.0, in Accordance with 10 CFR 50.55a(a)(3)(i)

Table 1
Critical Parameters for the Application of the Bounding Analysis as Applied to FNP - Unit 2

Parameter	Pilot Plant Basis	FNP – Unit 2 Basis	Additional Evaluation Required?
Dominant Pressurized Thermal Shock (PTS) Transients in the NRC PTS Risk Study are applicable	NRC PTS Risk Study (Reference 5)	PTS Generalization Study (Reference 6)	No
Through Wall Cracking Frequency (TWCF)	1.76E-08 Events per year (Reference 4)	2.61E-10 Events per year (Calculated using Reference 4)	No
Frequency and Severity of Design Basis Transients	7 heatup/cooldowns per year (Reference 4)	Bounded by 7 heatup/cooldowns per year (1)	No
Cladding Layers (Single/Multiple)	Single Layer (Reference 4)	Single Layer (2)	No

(1) Per the J. M. Farley Application for License Renewal, after 60 years of operation, the projected number of design basis transients is below the number specified in the 40-year design bases. As a result, FNP-Unit 2 is conservatively bounded by 7 heatup/cooldown events per year.

(2) The RV beltline cladding was applied by the use of the 3-wire submerged arc process (Reference 9). However, the bounding analysis conservatively assumed that the cladding was single layer.

Enclosure 1

Proposed Alternative FNP-ISI-ALT-09 Version 1.0,
in Accordance with 10 CFR 50.55a(a)(3)(i)

Table 2 **Additional Information Pertaining to Reactor Vessel Inspections for FNP - Unit 2**	
Inspection methodology:	The most recent inservice inspection in November 1999 of the Category B-A and B-D components was performed to Regulatory Guide 1.150 (Reference 7) requirements. Future inservice inspections will be performed to ASME Section XI Appendix VIII requirements as required by 10 CFR 50.55a.
Number of past inspections:	Two 10-Year inservice inspections have been performed.
Number of indications found:	Fourteen indications were identified in the beltline region during the most recent inservice inspection. All 14 indications were acceptable per Table IWB-3510-1 of the 1989 Edition of Section XI of the ASME Code (no addenda). Eight of these indications were within the inner 3/8th of the vessel thickness.
Proposed inspection schedule for balance of plant life:	The third inservice inspection originally scheduled for 2010 will be performed in 2020 plus or minus one refueling cycle. The fourth inservice inspection will be performed in 2040 plus or minus one refueling cycle. These RPV examinations will be performed to the ASME Code in effect for the ten-year ISI interval they are performed in.

Enclosure 1

Proposed Alternative FNP-ISI-ALT-09 Version 1.0,
in Accordance with 10 CFR 50.55a(a)(3)(i)

Table 3
Details of the Through Wall Cracking Frequency Calculation for FNP - Unit 2 @ 54 EFPY

Inputs

Reactor Coolant System Temperature, T_{RCS}[°F]:	N/A	T_{WALL} [inches]:	8.03

#	Region/Component Description (Ref. 10)	Material /Flux Type (Ref. 10)	Cu [wt%] (Ref. 10)	Ni [wt%] (Ref. 10)	R.G. 1.99 Pos.	CF [°F] (Ref. 10)	Un-Irradiated $RT_{NDT(U)}$ [°F] (Ref. 10)	Fluence [10^{19} Neutron/cm^2 E>1 MeV] (Ref. 10)
1	Inter. Plate B7203-1	A533	0.14	0.60	1.1	100.0	15	5.76
2	Inter. Plate B7212-1	A533	0.20	0.60	2.1	144.6	-10	5.76
3	Lower Plate B7210-1	A533	0.13	0.56	1.1	89.8	18	5.75
4	Lower Plate B7210-2	A533	0.14	0.57	1.1	98.7	10	5.75
5	Inter. Ax. Weld 19-923 A	-	0.027	0.947	1.1	36.8	-56	1.83
6	Inter. Ax. Weld 19-923 B	-	0.027	0.913	1.1	36.8	-60	1.83
7	Low. Ax. Weld 20-923 A	LINDE 0091	0.051	0.096	1.1	37.3	-70	1.83
8	Low. Ax. Weld 20-923 B	LINDE 0091	0.051	0.096	1.1	37.3	-70	1.83
9	Circ. Weld	LINDE 0091	0.153	0.077	1.1	74.1	-40	5.75

Outputs

Methodology Used to Calculate ΔT_{30}:	Regulatory Guide 1.99, Revision 2 (Reference 8)

	Controlling Material Region # (From Above)	RT_{MAX-XX} [°R]	Fluence [10^{19} Neutron/cm^2, E>1 MeV]	Fluence Factor	ΔT_{30} [°F]	$TWCF_{95-XX}$
Axial Weld – AW	2	618.25	1.83	1.166	168.56	2.20E-16
Circumferential Weld - CW	2	656.31	5.75	1.429	206.62	2.57E-14
Plate – PL	2	656.35	5.76	1.429	206.66	1.13E-10
$TWCF_{95-TOTAL}$ ($\alpha_{AW}TWCF_{95-AW} + \alpha_{PL}TWCF_{95-PL} + \alpha_{CW}TWCF_{95-CW}$):						2.61E-10

Enclosure 1

Proposed Alternative FNP-ISI-ALT-09 Version 1.0, in Accordance with 10 CFR 50.55a(a)(3)(i)

Table 4
List of Affected Components for FNP - Unit 2

ASME Category	ASME Item Number	Component ID	Description
B-A	B1.11	APR1-1100-2	RV Upper to Middle Shell Weld
B-A	B1.11	APR1-1100-5	RV Middle to Lower Shell Weld
B-A	B1.11	APR1-1100-8	RV Lower Shell to Lower Head Weld
B-A	B1.12	APR1-1100-3	RV Middle Shell Long Seam Weld
B-A	B1.12	APR1-1100-4	RV Middle Shell Long Seam Weld
B-A	B1.12	APR1-1100-6	RV Lower Shell Long Seam Weld
B-A	B1.12	APR1-1100-7	RV Lower Shell Long Seam Weld
B-A	B1.21	APR1-1100-16	RV Lower Head to Inter Ring Weld
B-A	B1.30	APR1-1100-1	RV Upper Shell to Flange Weld
B-D	B3.90	APR1-1100-17	RV Vessel to Nozzle Weld (Outlet)
B-D	B3.90	APR1-1100-18	RV Nozzle to Vessel Weld (Inlet)
B-D	B3.90	APR1-1100-19	RV Vessel to Nozzle Weld (Outlet)
B-D	B3.90	APR1-1100-20	RV Nozzle to Vessel Weld (Inlet)
B-D	B3.90	APR1-1100-21	RV Vessel to Nozzle Weld (Outlet)
B-D	B3.90	APR1-1100-22	RV Nozzle to Vessel Weld (Inlet)