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August 5, 2003

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Document Control Desk

Subject: Oconee Nuclear Station
Docket Numbers 50-269, 270, and 287
Supplement 2 to License Amendment Request associated with the Passive Low Pressure Injection Cross Connect Modification
Technical Specification Change (TSC) Number 2003-02

In a submittal dated March 20, 2003 Duke proposed to amend Appendix A, Technical Specifications, for Facility Operating Licenses DPR-38, DPR-47 and DPR-55 for Oconee Nuclear Station, Units 1, 2, and 3 to support installation of a passive LPI Cross Connect inside containment. On April 23, May 9, May 15, May 20, June 10 and June 19, 2003, Duke received questions from the NRC related to the LPI Cross Connect License Amendment Request. Duke provided responses to all questions except one (RAI-12) by letter dated July 22, 2003. The Attachment provides Duke's response to the remaining question.

Pursuant to 10 CFR 50.91, a copy of this proposed license amendment is being sent to the State of South Carolina.

A001

If there are any questions regarding this submittal, please contact Boyd Shingleton at (864) 885-4716.

Very truly yours,

R. A. Jones, Vice President
Oconee Nuclear Site

cc: Mr. L. N. Olshan, Project Manager
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Mr. L. A. Reyes, Regional Administrator
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Mr. M. C. Shannon
Senior Resident Inspector
Oconee Nuclear Station

Mr. Henry Porter, Director
Division of Radioactive Waste Management
Bureau of Land and Waste Management
Department of Health & Environmental Control
2600 Bull Street
Columbia, SC 29201

R. A. Jones, being duly sworn, states that he is Vice President, Oconee Nuclear Site, Duke Energy Corporation, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this revision to the Renewed Facility Operating License Nos. DPR-38, DPR-47, DPR-55; and that all the statements and matters set forth herein are true and correct to the best of his knowledge.

R. A. Jones, Vice President
Oconee Nuclear Site

Subscribed and sworn to before me this 5th day of August, 2003

Sheila A Smith
Notary Public

My Commission Expires:

6/12/2013

Attachment
RAI-12 Response Related to Oconee Amendment Request

RAI-12: Due to the recent V.C. Summer event of primary water stress corrosion cracking (PWSCC), the staff has a general concern over PWSCC and other unidentified degradation mechanisms on proposed LBB piping. As a result, the staff requested recent LBB applicants to perform a sensitivity study using a crack morphology (surface roughness and number of turns) characteristic of transgranular stress corrosion crack (TGSCC). Information contained in NRC NUREG/CR-6443, "Deterministic and Probabilistic Evaluations for Uncertainty in Pipe Fracture Parameters in Leak-Before-Break and In-Service Flaw Evaluations," may be useful. You only need to perform this analysis for SMAW weld at location 2 having a margin of 2.4 on flaw sizes. The staff understands that using the suggested TGSCC crack morphology will reduce the margin significantly. The purpose is to know how much margin (10 for leakage, and 2 for flaw sizes) that the piping still has should a TGSCC occur.

Answer: The margin quoted in the RAI question appears to be a typographical error. The FANP LBB report provides a margin of 2.8 on flaw sizes for SMAW weld at location 2.

NRC NUREG/CR-6443, "Deterministic and Probabilistic Evaluations for Uncertainty in Pipe Fracture Parameters in Leak-Before-Break and In-Service Flaw Evaluations," describes different default crack morphology parameters used in three different leak rate analysis codes. In the NUREG, the largest default surface roughness is 3150 μin and largest default number of 90° turns is 152/in. These parameters, as well as a range of parameters both lower and higher were used to create a test matrix. The range of parameters is listed in Table 1.

Table 1. Crack Morphology Parameters

Surface Roughness (μin)	Number of 90 Turns (#/in)
196.80	0
2008.44	1
3150.00	10
3820.08	35
6537.54	65
9255.00	152
21185.38	250
	572
	1162

The critical flaw size in LBB topical report is 9.74 inches. This flaw size corresponds to a margin of flaw size of 1. The leakage size crack for this critical flaw is 19.48 inches. For the SMAW weld at location 2 with surface roughness of 196.8 μin and 0 turns, the leakage flaw size is 3.435 in, corresponding to a margin of 2.8 on flaw size. For margins on flaw size of 2 and 1.5, the leakage size cracks are 9.74 and 12.99 inches, respectively.

The two highest surface roughness values – 9255 and 21185.38 µin – are the crack opening displacements (COD) for leakage size cracks of 9.74 and 12.99 inches, respectively.

57 tests (utilizing FANP's program KRAKFLOW) were run using combinations of the surface roughness and number of turn values in Table 1. It was decided to maintain the margin of 10 on leakage. The resulting leakage size crack lengths and margin on flaw size were determined for the various permutations of crack morphology. Table 2 lists the leakage size cracks and Table 3 lists the corresponding margins on flaw size. Figures 1 shows the leakage size crack lengths vs. number of 90° turns, while Figure 2 shows the margin on flaw size vs. number of 90° turns.

Table 2. Leakage Size Crack Lengths

Surface Roughness (µin)	Number of 90 Turns (#/in)								
	0	1	10	35	65	152	250	572	1162
196.80	6.87	7.249	8.826	9.821	10.423	11.313	11.897	12.990	
2008.44	7.929	8.236	9.720	10.843	11.482	12.473	13.098	14.302	
3150.00	8.198	8.528	10.037	N/A**	N/A**	12.753	13.418	14.645	
3820.08	8.327	N/A**	10.124	11.232	11.881	12.889	13.564	14.802	
6537.54	8.753	9.131	10.384	11.604	12.286	13.332	14.014	15.270	
9255.00	9.092	9.499	10.798	11.899	12.585	13.640	14.347	15.626	
21185.38	10.112	10.415	11.618	13.004	13.790	14.604	15.396	16.556	17.645

**Note: KRAKFLO would not converge for these combinations of crack morphology parameters

Figure 1. Comparison of Leakage Size Cracks for Various Crack Morphology Parameters

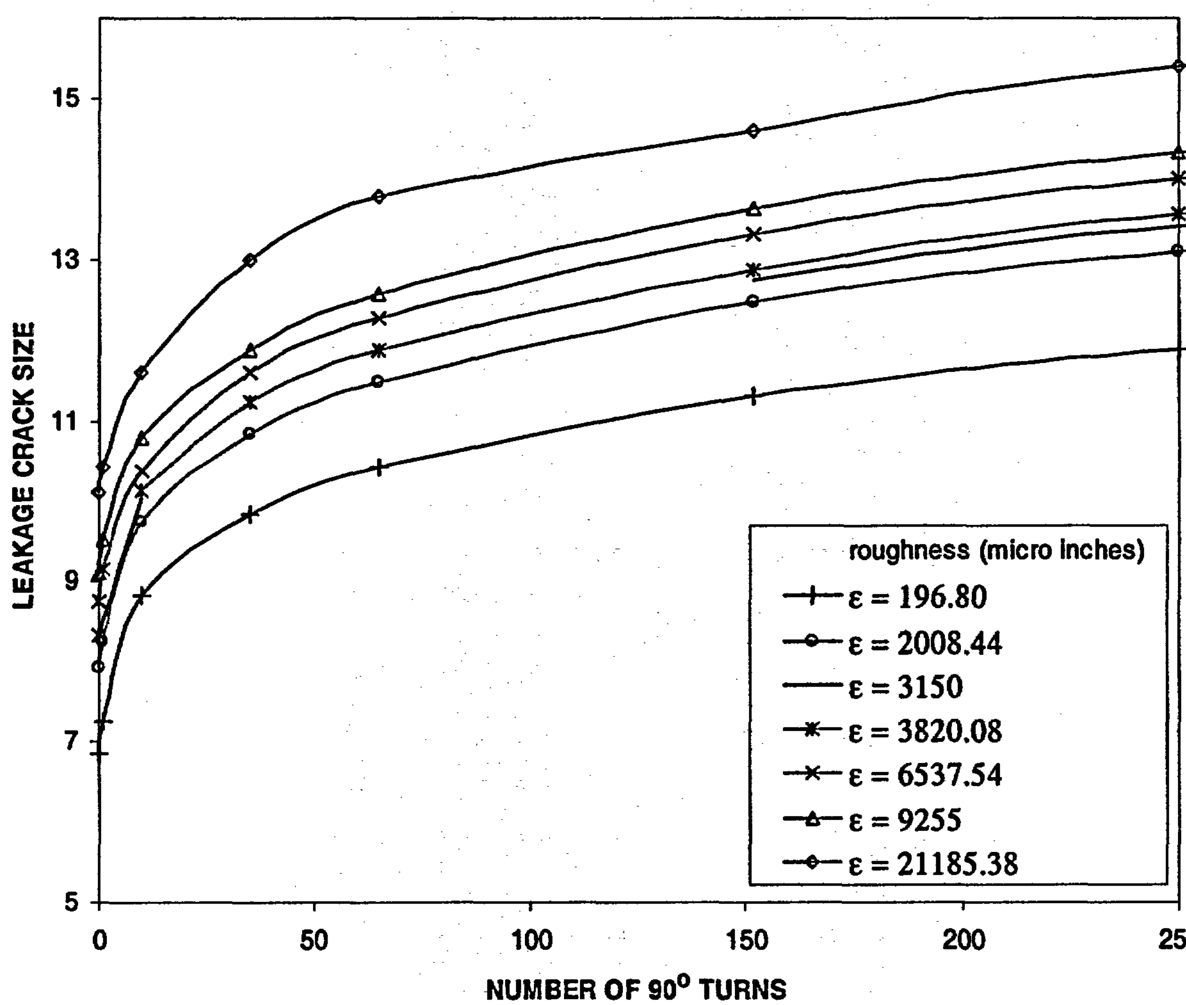
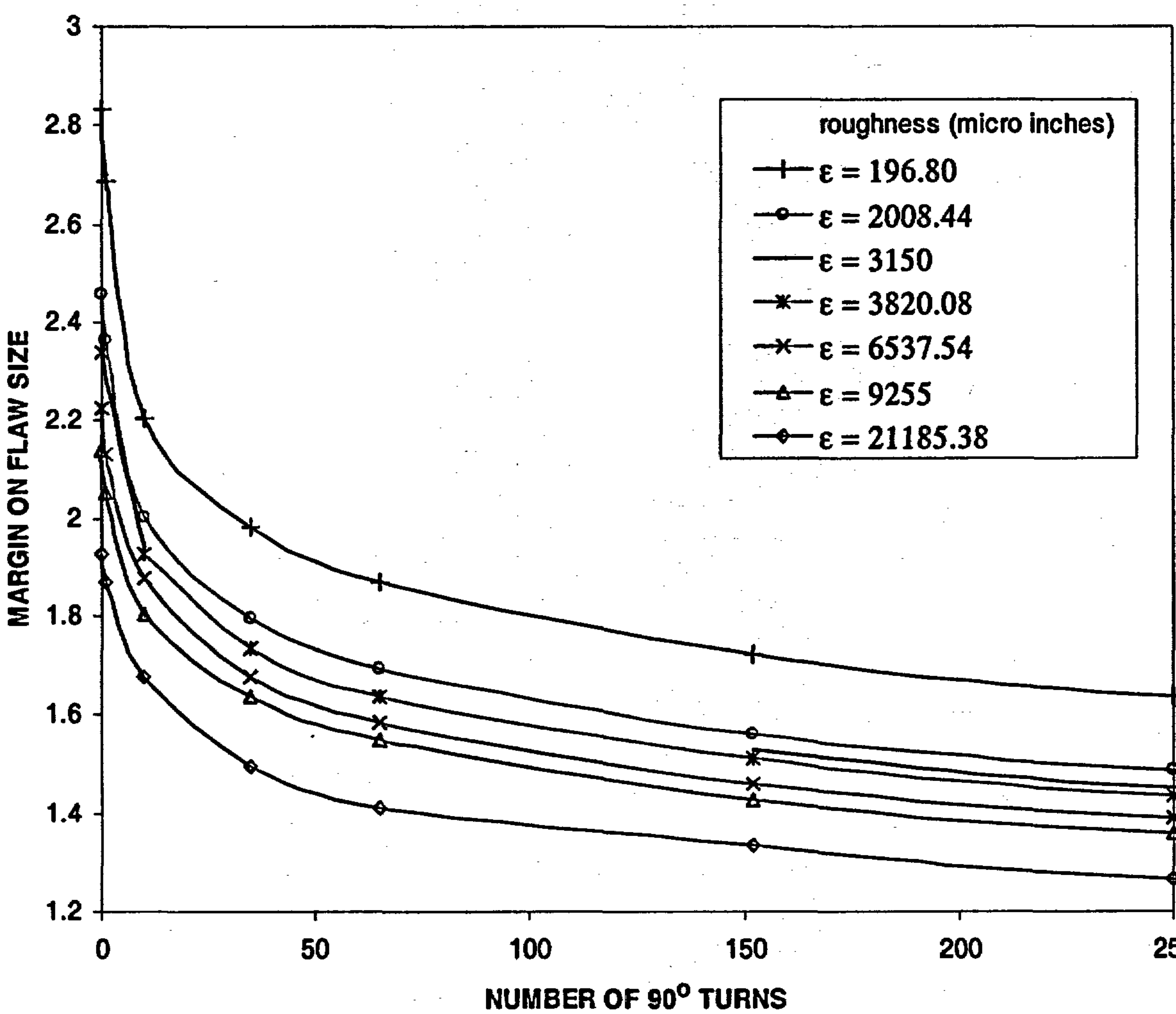


Table 3. Margin on Flaw Size

Surface Roughness (µin)	Number of 90 Turns (#/in)								
	0	1	10	35	65	152	250	572	1162
196.80	2.84	2.687	2.207	1.983	1.869	1.722	1.637	1.500	
2008.44	2.457	2.365	2.004	1.796	1.697	1.562	1.487	1.362	
3150.00	2.376	2.284	1.941	N/A**	N/A**	1.527	1.452	1.330	
3820.08	2.339	N/A**	1.924	1.734	1.640	1.511	1.436	1.316	
6537.54	2.226	2.133	1.876	1.679	1.585	1.461	1.390	1.276	
9255.00	2.143	2.051	1.804	1.637	1.548	1.428	1.358	1.247	
21185.38	1.926	1.870	1.677	1.498	1.413	1.334	1.265	1.177	1.104

**Note: KRAKFLO would not converge for these combinations of crack morphology parameters

Figure 2. Comparison of Flaw Size Margin for Various Crack Morphology Parameters



The leakage size cracks in Table 2 all have a margin on leakage of 10. For the NUREG/CR-6443 highest default crack morphology parameters for surface roughness of 3150 µin and largest default number of 90° turns of 152/in, the margin on flaw size is 1.527. Using the range of surface roughness and number of turns specified above, it was not possible to obtain a margin less than 1.104. The parameters that would be required to obtain a margin of 1.0 or less are considered highly unlikely, even for a TGSCC type crack.