

**From:** "BENNETT, STEVE A" <SBENNE2@entergy.com>  
**To:** Tom Alexion <twalex@nrc.gov>  
**Date:** 2/5/04 11:00AM  
**Subject:** Response to Emmett Murphy RAI on ANO-1 SG ISI Report

Tom, See response to Emmett's RAI below. Let me know if there is needed followup discussion.

5. Provide summary description of how the 1.87 gpm leak rate estimate was determined for LBLOCA. This should include the following information:

a. Does this estimate consider leakage from flaws other than circumferential cracks?

Response: A small amount of leakage was assigned to repair products for 1R17. That is the only other leakage assigned besides circumferential flaws. The leakage values assigned to flaws are in accordance with the ANO-1 Safety Evaluation Report dated March 28, 2001 which states:

Determination of the best-estimate total leakage that would result from an analysis of the limiting LBLOCA based on circumferential cracking in the original tube-to-tubesheet rolls, tube-to-tubesheet reroll repairs, and heat affected zones of seal welds as found during each inspection.

b. Brief description of method used to calculate leakage for circumferential cracks in the original roll or heat affected zone adjacent to the tube-to-tubesheet seal weld if no reroll is present.

Response: The reported leakage associated with the rolled joint or the heat affected zone is the calculated leakage through the rolled joint as determined by loading and predicted dilations for LBLOCA for that specific radial location (ratio added for LBLOCA loads). The leakage for a specific flaw is determined by calculating the stress on the flaw, determining the percent degraded area (PDA) of the flaw and assigning leakage.

c. Brief description of method used to calculate leakage for circumferential cracks at or below lower transition of original roll if no reroll is present.

Response: The leakage is determined by sizing the flaw and determining which section of the flaw could leak without taking any credit for rolled area. The leakage is determined by taking the lesser of the leakage associated

with the actual flaw and the leakage through the annulus.

d. Brief description of method used to calculate leakage for circumferential cracks at reroll repair.

Response: A reroll length as short 0.86ΓÇ¥ has been leak tested by Framatome under operational and accident conditions. This leakage is applied if the flaw has moved into the heel transition (outboard or non-pressure boundary). Again, depending upon the radial distance of tube with the flaw, a leak rate is assigned through the reroll joint or the leak associated with the actual flaw whichever is less. No circumferential cracks were found in rerolls during 1R17.

e. Brief description of method used to calculate leakage for circumferential cracks inboard of reroll repair.

Response: The leakage is determined by sizing the flaw and determining which section of the flaw could leak without taking any credit for rolled area. Again, annulus leakage was assigned as discussed in item ΓÇ£cΓÇ¥ above.

f. Brief description of method used to calculate leakage for circumferential cracks outboard of reroll repair. Are the portions of tubing outboard of reroll repairs subject to inspection?

Response: Yes the outboard reroll is inspected for Circ cracking. As discussed above, the leakage assigned is the leakage through the reroll joint or the leakage through the flaw, whichever is less.

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