

From: Thomas Alexion
To: RSCHEID@ENTERGY.COM
Date: 11/25/02 10:02AM
Subject: RAI ON USE OF METAMIC

Dick,

See the attached RAI.

Tom

REQUEST FOR ADDITIONAL INFORMATION
RELATED TO THE TOPICAL REPORT SUPPORTING
THE USE OF METAMIC IN SPENT FUEL POOL APPLICATIONS
ARKANSAS NUCLEAR ONE, UNITS 1 & 2

1. Appendix A describes the technical assessment of the B4C distribution in Metamic.

One source of areal density variation across a plate of Metamic is variation in thickness across the plate. How does the areal density variation change with respect to the increase in thickness variance due to the manufacturing of larger panels? How were these areal density measurements obtained?

2. General questions on testing.

- a. How often were each of these tests performed? What is the reliability of the data acquired?
- b. Are there any full length inserts currently used in spent fuel pools? If so, were there any tests and/or inspections performed on these inserts? What were the results of these tests and/or inspections?

3. The physical properties and testing of the Metamic samples are described on pages 6 - 10 of Attachment 2 to the application dated August 8, 2002.

- a. The description of physical appearance of the 15 w/o mill-finish coupons on page 6 states that a slight darkening was observed after exposure to 900°F after 48 hours while the 31 w/o mill-finished coupons did not appear to have any changes. What are the possible causes of this discoloration? Were there any other physical changes such as blistering, peeling or cracking of the coupons?
- b. The density of the coupons was stated to have no changes for both short-term and long-term testing. Describe how the density was determined for the coupons before and after both short-term and long-term testing. Include details on the areas tested, the technique, and the instrumentation.
- c. The description of mechanical properties on page 7 states that the coupons not subject to elevated temperatures were used for pre-test data. Are these coupons from the same lot as those coupons used for all tests; i.e. short-term and long-term tests?
- d. Both short-term and long-term tests were performed in an air environment. Were there any results from tests completed in an aqueous environment? If so, what were these results and how do these compare with the results provided in Attachment 2?

4. The corrosion testing of Metamic is described in pages 11 - 15 of Attachment 2 to the application.
 - a. Were there any considerations for this testing to account for fluid movement, temperature fluctuations, radiation dose changes, and intermittent scratching of the surfaces at different instances during the test? If so, provide details of these considerations and their impact on the results.
 - b. Details on the coupons tested are provided in a table on page 11 of Attachment 2. Provide details on the nature of the general scratches on the anodized metamic coupons. How were these scratches created? How long was each scratch? How deep was each scratch? Were there any residual metals found in the cracks prior to testing?
 - c. Discuss why the distribution of the coupons tested is weighted towards the 15 w/o coupons. Is there an expectation that the results of the 15 w/o coupons can be extrapolated for the 31 w/o coupons? If so, what is the basis for this expectation?
 - d. What types of chemicals were used to clean the coupons in order to remove impurities prior to anodizing? How "limited" were the local pits formed from the chemical cleaning described on page 13 of Attachment 2? On what samples were these pits formed? Were there some areas of preferential pitting on the samples?
 - e. What were the material changes of the general coupons with scratches? Were there any weight changes? Any changes in B4C density? Was there any blistering, cracking, or flaking visible?
 - f. Were there any gases released during the formation of the oxide layer on the coupon; i.e., was bubbling observed coming from the coupon?
5. The resistance of Metamic to radiation damage is described in pages 16-18 of Attachment 2 to the application.
 - a. Were there any tests performed on the coupons with the combination of a wet environment (boric acid and/or deionized water) and varying radiation exposure? If so, what were the results?
 - b. What is the basis for the statements made in the 2nd paragraph of page 17? What is the typical "higher radiation dose" referred to in those statements?

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