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DENTON, H. R. Office of Nuclear Reactor Regulation

SUBJECT: Forwards addl info per IE Bulletin 79-17 re potential for cracks in stagnant borated water environ. Due to trained staff shortage, requests forty day extension to fulfill requirements of IE Bulletin 79-17, Item 6.

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September 27, 1979
AEP:NRC:00255A

Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-54 and DPR-74
Additional Information Relevant to I.E. Bulletin No. 79-17

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

The Attachment to this letter contains our responses to four questions we received over the telephone from your Staff on September 13, 1979. These questions, which deal with the potential for cracks in a stagnant borated water environment, are part of the Commission's request for additional information to complete the review of our spent fuel storage cpacity expansion program and were generated in connection with IE Bulletin No. 79-17.

In addition, we would like to request an extension of 40 days to fulfill the requirements set forth under Item 6 of IE Bulletin No. 79-17. This extension, both for the inspection and for the submittal of the subsequent written report, is required to accomodate shortage of trained personnel and contractors to perform this task.

Very truly yours,

John E. Dolan

John E. Dolan
Vice President

JED:em

cc: R. C. Callen
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ATTACHMENT
TO
AEP:NRC:00255A

1. Question

Are the materials in the spent fuel pool complex at Donald C. Cook the same as those where cracks were found in TMI-1, that is, 304 stainless steel?

Answer

The spent fuel racks and the cooling pipe system are constructed of type 304 stainless steel. The liner is constructed from 304L stainless steel.

2. Question

Are these components, with like materials, immersed in the same environment as at TMI-1?

Answer

The spent fuel pool is filled with oxygenated, borated water. Once fuel is placed in the pool, natural circulation takes place within the pool, which is augmented by flow from the pool cooling system. The spent fuel racks are designed to minimize the possibility for water stagnation within the rack structure. Therefore, although the chemical make-up of the pool environment is similar to that at TMI-1, the important ingredient of stagnation is missing in the Donald C. Cook spent fuel pool.

3. Question

If so, what is the potential for the type of cracks identified in IE Bulletin No. 79-17?

Answer

The potential for cracking, of the type identified in IE Bulletin 79-17, should be quite low for the spent fuel storage racks in the spent fuel pool. Not only is the water in the spent fuel pool not stagnant, but the metallurgy of the type 304 stainless steel in the racks is controlled during manufacture and fabrication to minimize sensitization in the weld heat-affected zones. The material is procured in the quenched condition, and the welding heat input is closely controlled and minimized to reduce the probability of carbide precipitation. This will increase the material's ability to resist stress corrosion cracking in the weld heat-affected zone.

Potential for cracking is considered to be very low in the liner since it is fabricated from the low carbon version of 304, and all welding at the Cook Plant was performed with interpass temperature control. Carbide precipitation in the heat-affected zone of the liner has, in this manner, been eliminated or greatly minimized.

Potential for cracking is also considered to be very low for the cooling system piping associated with the spent fuel pit as these lines are not stagnant. Fabrication was to a specification that required a maximum weld interpass temperature of 350°F so that carbide precipitation in the heat-affected zone would be minimized and thus reduce the possibility for stress corrosion cracking.

4. Question

If there is cracking what is the consequence of the loss of function/integrity of the component?

Answer

The spent fuel storage racks are highly redundant structures assembled with many small welds. Cracking of a small percentage of these welds would not, therefore, have a significant effect on the functional integrity of the racks. Any crack in the liner would be detected by our leak detection system. The plant operators are instructed to check for spent fuel pool water leakage daily. Detection of leakage would occur, therefore, before there was any significant loss of fluid or loss of structural integrity.

We add here a few comments that are pertinent to the general intent of this attachment. In our submittal No. AEP:NRC:00213B dated September 26, 1979, we pointed out that no cracks had been found during the inspection performed in the cooling systems of the spent fuel pool. A weekly chemical analysis is performed of the pool water. This analysis checks for, among other things, the presence of fluorides and chlorides, both of which could be connected with the potential for stress corrosion cracking. The analysis results have always been below our detectability level. As we also pointed out in our submittal No. AEP:NRC:00213B, there is sufficient certainty of our ability to add make-up water to the pool in case such need arose as a result of cracks in the cooling system. Finally, no conclusive evidence has been found at this time to identify those chemical species which promoted the intergranular stress corrosion cracking (IGSCC) discovered in Three Mile Island Unit 1.

When the precise causes for the IGSCC are discovered, their relevance to the Cook Plant Spent Fuel Pool and associated cooling system will be analyzed.