

Florida Power

CORPORATION
Crystal River Unit 3
Docket No. 80-302

February 5, 1993
3F0293-03

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Subject: Reactor Building Paint - Supplemental Information

Reference: A. FPC to NRC letter, dated June 26, 1992 (3F0692-18)
B. NRC to FPC letter, dated February 9, 1987 (3N0287-15)

Dear Sir:

Florida Power Corporation (FPC) is submitting this letter to provide responses to four questions raised by the NRC Staff in an October 20, 1992 telecon between the NRC (Mr. H. Silver, et al) and FPC (Mr. J.W. Tunstill, et al). These questions deal with the 10 CFR 50.54(a)(3) request for the reactor building painting program discussed in Reference A. We have repeated each question with our response in the attachment to this letter.

The proposed change in the Crystal River Unit 3 (CR-3) painting program inside the Reactor Building (RB) is necessary because some quality control requirements for paint application are too stringent for use in the entire RB. The quality requirements for the paint itself remain unchanged. Presently, the RB coatings meet the same application requirements no matter where in the RB the paint is applied. FPC is proposing that CR-3 have two levels of protective coatings control for the RB.

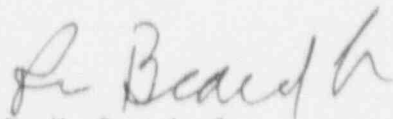
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For purposes of the fundamental analysis, the RB will be composed of three areas: "near field," "far field," and "outside field." The "near field" are areas of the RB where failed coatings could fall directly onto the sump. The "far field" are areas where the transport of the failed coatings via localized, post-LOCA, ECCS flow velocities could result in the coating particles contributing to sump blockage. The "outside field" is any area not designated as being in the other two areas. Failure of coatings in the "outside field" cannot affect post-LOCA ECCS performance.

The highest level of quality control for protective coatings will be applied to those areas of the RB which will be designated as being in either a "near field" or a "far field." These controls are described in Requirement Outline RO-3147, Painting and Protective Coatings which is FPC's existing program for these areas. A reduced level of quality control will be applied to protective coatings in the "outside field." Following NRC approval of this proposed change, both levels of control will be described in RO-3147.

The existing RB painting program and RO-3147 were the subject of a specific NRC inspection in 1986. The program was found to be acceptable in Reference B. This program will continue to be applicable to those areas which affect post-LOCA ECCS performance.

Sincerely,



P. M. Beard, Jr.
Senior Vice President
Nuclear Operations

PMB/JWT

Attachment

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

NRC QUESTION 1

Did the licensee consider the effect caused by the particles of paint smaller than those considered in the analysis ($\frac{1}{4}$ " x $\frac{1}{4}$ ")? These particles could be transported to the containment sump, pass through its screen and under certain circumstances could affect the performance of the containment spray by blocking its nozzles, interfere with the ECCS, or cause fouling of the reactor core heat transfer surfaces.

FPC RESPONSE

FPC has evaluated the effect of smaller paint particles in the Reactor Building (RB) Emergency Sump. FPC concludes that blockage will not occur within the reactor core or any reactor auxiliary system component. Three reactor auxiliary systems take suction from the RB Emergency Sump during a LOCA following switchover from the Borated Water Storage Tank (BWST). The systems are Building Spray (BS), Low Pressure Injection (LPI), and High Pressure Injection (HPI).

The components within the BS system which might be adversely affected by large pieces of coating are the BS pumps and the BS spray header nozzles. FSAR Section 6.2.2.1 discusses the design basis of the BS system and the adequacy of the $\frac{1}{4}$ " x $\frac{1}{4}$ " mesh in the RB Emergency Sump. Specifically, the text (Page 6-17) states that the size of the mesh is consistent with (i.e. less than) the $\frac{3}{8}$ " diameter opening of the BS nozzles. Later in the same FSAR Section, FPC states that particles which are not retained by the sump mesh will flow through the LPI System and the BS System.

To reconfirm these statements, FPC reviewed vendor drawings for pumps BSP-1A, BSP-1B, DHP-1A, and DHP-1B to determine minimum clearances in the pumps. We also contacted Dresser Pump representatives to confirm that minimum clearances between the impeller and volute casing for these pumps are on the order of one (1) inch.

FPC also evaluated the internal clearances within the HPI pumps. Each HPI pump is identical with nine (9) stages. Our review of vendor drawings showed that clearances between the pump casing and the impellers ranged from approximately 0.26 inches to 0.4 inches on the sides and the end of the individual volute casings, respectively.

Based on these evaluations, FPC concludes that no blockage will occur for any component which takes suction from the RB Emergency Sump due to paint particles less than $\frac{1}{4}$ " x $\frac{1}{4}$ ".

FPC analyzed the impact of this size paint particle on the core heat transfer surfaces. We reviewed the capacity of portions of the RB Emergency Sump and reactor vessel lower plenum to hold the failed coatings once the paint had settled out of the recirculating ECCS stream. We also evaluated whether or not the ECCS core flows would entrain the paint particles. The ECCS flow rates evaluated were the minimum flow required to offset the core boil-off rate and the maximum flow produced by two low pressure injection pumps in operation. The analysis determined that the paint's density would preclude flow blockage. Any failed coatings which could enter the RB Emergency Sump or the reactor vessel would congregate either on the bottom of the sump or the lower area of the reactor vessel, respectively, and would not remain in the flow stream. The combined volume of the RB Emergency Sump below the post-LOCA recirculation inlet nozzles and the reactor vessel lower plenum is greater than the total volume of paint in the RB. The paint will not be transported through the reactor core and a coolable geometry will be maintained.

NRC QUESTION 2

What are the areas of paint in the "near field" and the "far field"? What percentages of the total painted area do they represent?

FPC RESPONSE

The "Near Field" area is approximately 1,150 ft². The area comprising both the "Near Field" and "Far Field" area is approximately 28,285 ft². The total painted area within the RB is approximately 213,400 ft². The areas which will continue to be subjected to the more rigorous painting requirements comprise 13% of the total painted area within the RB.

NRC QUESTION 3

The assumption, mentioned in the letter [Reference A], that no overlap of particles on the sump screen is considered would be needed only if the paint in the "near" and "far" fields were not qualified and could produce particles which could reach the sump. Please explain your position.

FPC RESPONSE

The NRC statement is correct. The conservative assumption listed on page 2 of Reference A regarding no overlap of failed coating particles on the RB sump screen is not applicable to the subject analysis. It should not have been included as an assumption for this analysis.

NRC QUESTION 4

What would be the amount of hydrogen generated from the non-qualified organic coatings exposed to the post-LOCA conditions? Will it affect current safety analyses for the plant?

FPC RESPONSE

FPC's revised RB coatings program will not change the type of paint to be applied inside the RB. The paint currently being used in the RB meets the standards for paint exposed to a LOCA environment. Since the same paint will continue to be used in all RB areas, regardless of location, no additional hydrogen generation concerns exist, and the existing safety analyses for the plant are not affected.