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

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) Detroit Edison Letter to NRC, "Coatings Inside Containment," EF2-72778, dated August 28, 1984.

3) Detroit Edison Letter to NRC, "Primary Containment Coatings Evaluation - Transmittal of Additional Information," EF2-72271, dated October 11, 1984.

4) Detroit Edison Letter to NRC, "Responses to Six Additional NRC Staff Questions," EF2-72045, dated January 10, 1985.

5) Detroit Edison Letter to NRC, "Primary Containment Coatings, Additional Information," NE-85-0048, dated January 24, 1985.

6) Detroit Edison Letter to NRC, "Primary Containment Coatings Transmittal of Final Report No. DECo-12-2191, Revision 4, 'Evaluation of Containment Coatings'", VP-85-0140, dated June 28, 1985.

Subject: Results of Inspections and Repairs of Primary Containment/Torus Coatings During First Refueling Outage

References 2 - 6 provided the NRC staff with various correspondence on Detroit Edison Company's (DECo's) evaluation of containment coatings at Fermi 2. The purpose of this letter is to provide the NRC staff with the results of inspections and repairs of those coatings for your information as committed in the reference correspondence.

During the current (first) refueling outage, 100% of the interior and exterior of the Torus was inspected. In general, the Torus and related structures were found to be in good condition. Although some

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surface rust was found as described below, there were no measurable pits or corrosion found on the Torus shell. Minor touchup of the coatings was completed on the exterior of the Torus.

For the interior Torus work, S. G. Pinney and Associates, Inc., was contracted by DECo to conduct underwater inspection, desludging and coating repair. This work and the results consisted of the following:

- All instrumentation and associated wires installed for the Safety Relief Valve (SRV) blow-down tests were removed and related areas recoated. No measurable pitting/corrosion was found.

- Minor mechanical damage to the coating was found and repaired.

- Small blisters, characterized as #4 to #6 medium-dense blisters as rated on the ASTM scale (i.e., 1/32" to 1/4"), were found on the suppression chamber immersion phase protective coating system. They are located between 4:00 and 8:00 o'clock on the bottom invert of the Torus shell.

  There was no evidence of spontaneously ruptured blisters, i.e., the blisters are intact and exhibit film cohesive strength. Selected areas of the blistered coating were removed, inspected and recoated. During the inspections, no corrosion/pitting was found under the blisters.

  The condition of the blistered area was further evaluated by nuclear engineering and the coating consultants. A review of the DECo records indicates that the Plasite 7155 coating materials originally used were mixed and applied in accordance with the manufacturer's instructions and DECo's specification, including a force-heat cure of the original coating following application. However, due to subsequent Mark I containment modification work, repairs of the original coating were required for some areas. Per the manufacturer, it was sufficient to only air dry the repair coating. Thus, forced heat curing of the repair coating was not required. The root cause of the blistering was solvent entrapment. This occurs when the coatings are not force-heat cured. This phenomenon is common with epoxy enamels used in immersion service if post-curing is not utilized to "bake out" any residual solvents in the coating film. The epoxy enamels are a densely cross-linked polymer film and, as such, it is difficult for the coating solvents to escape after application. The blisters are estimated to have developed within the first year after coating application.

Based on the inspections of the Torus shell surface where the blisters were removed, active corrosion is not expected to occur under the remaining intact blistered coating. In addition, the Fermi 2 containment is kept inerted with nitrogen gas during plant operation. This further reduces the potential for corrosion of the Torus shell. These epoxy enamels have been used successfully in suppression pool service for many years at various other stations. Blistering of the coating has also been discovered at other stations and has been shown to have no negative impact on safe operation. Specifically, DECo's evaluations have concluded that the blisters found at Fermi 2 will not affect corrosion of the suppression chamber nor will they come off and plug Emergency Core Cooling System strainers during a Design Basis Accident or normal plant operation.

To monitor the blister areas, photographs of selected areas were taken. These areas will be inspected during subsequent refueling outages, new photos will be taken and compared with the original photos to detect any changes in the blistering. These inspections will be documented. An engineering evaluation will then be made to accept the coatings for continued operation or make repairs, as appropriate.

o Inspection of the coatings in the vapor phase area of the Torus shell were completed and repairs performed as needed. Some areas were not repaired due to inaccessibility and/or based on evaluations which did not justify the need for repairs as follows:

- The surface of the vacuum breaker flanges are slightly corroded. This light rusted surface will have no impact on the operability of the vacuum breakers.

- Minor mechanical damage to the coating surface of the vent header and down-comers was not repaired. The corrosion in the damaged areas is very light with no apparent pitting. Leaving these areas uncoated will have no impact on vent system operability.

- The eight vent header deflectors were not coated. These steel deflectors are approximately 1-1/2" thick and provide no structural requirement. Deflectors will rust approximately 1 mil per year. If painting would have been needed, blasting of these surfaces would have been required. During this time the deflectors were partially submerged in the water. It was not feasible to paint them during this refueling outage since the

blasting would have presented a potential airborne contaminants concern and may have required cleanup of the suppression pool water.

The suppression chamber air space will be inerted during plant operation. Therefore, any additional corrosion to the above areas is expected to be minimal. DECo will inspect and repair as needed those areas not repaired, as noted above, at the Second Refueling Outage.

If you should have any questions regarding this information, please contact Terry L. Riley, Supervisor of Compliance and Special Projects, Nuclear Licensing, at (313) 586-4041 (or x-1684).

TR:jr

Sincerely,

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