Regulatory File Cy.

50-237

Commonwealth Edison Company

ONE FIRST NATIONAL PLAZA ★ CHICAGO, ILLINOIS

Address Reply to:

POST OFFICE BOX 767 ★ CHICAGO, ILLINOIS 60690

May 21, 1971

Dr. Peter A. Morris, Director
Division of Reactor Licensing
U.S. Atomic Energy Commission
Washington, D.C. 20545

Subject: Additional Information Concerning the Operation of Dresden Unit 2

Dear Dr. Morris:

On April 24, 1971, we submitted to you Dresden Special Reports Numbers 10 through 13. Report Number 12 of that series discussed the torus paint problem and the status of that problem as of April 21, 1971.

Attached hereto is a Report entitled, Supplemental Information to Special Report #12 - Torus Paint Problems, Dresden - Unit 2. This Report discusses all of the torus paint problems which have been found and the solution which has been taken to solve these problems. In addition, the Report indicates that during the next refueling outage of Dresden Unit 2, the Dresden 2 torus will be drained and an inspection made of the torus paint.

In addition to three signed originals, 19 copies of this submittal are also being transmitted.

Very truly yours,

Byron Lee Jr

Byron Lee, Jr.
Assistant to the President

SUBSCRIBED and SWORN to before me this 21st day of May, 1971.

Patricia A. Nelson
Notary Public

2447

237-280.1 DL

Supplemental Information
to
Special Report #12

Regulatory File Cy.

Received w/Ltr Dated 5-21-71

Torus Paint Problems
Dresden - Unit 2

The submittal "Special Reports" dated April 21, 1971, included Report No. 12, Torus Paint. This report stated that an inspection of the torus paint above water level revealed three types of coating distress: pinpoint rust to metal substrate, blisters ranging in size from 1/8 inch to 1½ inch in diameter, and small areas of delamination between the finish coat and the prime coat. On April 29, 1971 these paint problems were explained further to the ACRS Subcommittee and the AEC Staff.

Subsequent to the date of the report and the presentation in Washington and immediately after the reactor core was reconstituted, the torus was emptied of water and a thorough inspection made of the paint below the water level. This inspection revealed additional paint problems.

Considerable delamination, separation of the paint between the two primer coats, on the inboard torus wall in an area around the torus between 4 and 5 o'clock, representing a wall width of approximately 8 feet, was found. Approximately 10% of the painted surface in this area, or about .5% of the total coated surfaces, was affected. Major delamination occurred in 6 of the 16 bays. Minor delaminations in two or three areas per bay, each area affected representing less than 1 sq.ft. were found in 4 bays. The paint in the remaining 6 bays was found to be in excellent condition.

The delaminated areas were discolored and a thin, continuous film of water was found behind the coating. All areas of delamination showed the delaminated coating was intact and evidenced a very tough surface. Only with considerable effort with sharp knives was it possible to cut through the coating to initiate removal of the delaminated material.

Small delaminated areas between 7 and 8 o'clock on the outboard torus walls were found in 2 bays. Each delamination was less than 1 ft.sq. and represent only a few isolated cases. The remainder of the coating in this area is in excellent condition. There are no delaminations of this type on internal surfaces such as baffles, the 4-foot diameter vent header, downcomers, grating, etc.

After the bottom of the torus had dried, four small cracks in the paint were found at 6 o'clock. The cracks involved the finish coat and second primer coat, the first primer coat, on the metal, showed no crack indications. The cracks ranged in length from 6 inches to 18 inches.

280.2

Small blisters, generally varying in size from 1/8 inch to 1/2 inch, were found over much of the lower half of the torus. A few blisters up to 1½ inch size were also found. These blisters are the same type found in the upper half of the torus in which the separation occurred by shearing or pulling apart of the prime coats. These blisters are firm and tight with a small amount of liquid underneath each blister. In no instance was any coating missing from a blister.

In summary, the torus paint problems which have occurred both above and below the water are as follows:

1. Pinpoint rust to metal - These areas are small and isolated and were undoubtedly caused by holidays in the coating which for some reason were not detected during inspection of the completed coating work or were caused by too thin a coating over some sharp metal projections or over sand particles.

2. Blistering - Two types of blisters, all of which were 1½ inch or less in diameter, were found.

   a) Blisters caused by separation between the prime and finish coats. These blisters were few in number and probably caused by isolated cases of improperly prepared surface.

   b) Blisters caused by shearing or the pulling apart of the finish coat and the second prime coat from the first prime coat. The failure mode of this problem is, at present, unknown.

3. Large Delaminated Areas - These delaminations occurred on the inboard torus wall and the cause of failure is unknown. However, the paint experts who are trying to determine the cause of this mode of failure all agree that the coating materials and application, including preparation of the steel surfaces, are not probable causes of the delaminations.

4. Small Delaminated Areas - These delaminations occurred on the outboard torus wall and the cause of failure is unknown.

5. Cracking of coating at bottom of torus - The cause of this failure is unknown, however it has been determined that these small cracks did not open up until after the coating dried out.

After completion of the inspection, we reviewed the various paint problems and decided to make the following interim repairs:

1. The small isolated areas of pinpoint rusting have been ground down to bare metal, cleaned, and recoated with the originally specified Phenoline 368.

2. The blisters caused by separation of the coats have been ground down to bare metal, cleaned, and recoated with the originally specified Phenoline 368.

Blisters caused by shearing of the primer coats having a diameter greater than $\frac{1}{4}$ inch and above the water level were removed, the remaining portion of the primer coat cleaned, and recoated with the originally specified Phenoline 368. The remaining blisters, above water, are all very small, tight, and firm. These blisters were left undisturbed.

3. The delaminated areas and the blisters on the inboard torus wall have been shot blasted to remove the separated material. The surface was then gone over thoroughly to remove the small pieces of remaining delaminated material. The shot blasting did not disturb the first prime coat which in all cases is firmly adhered to the metal surface. The perimeters of the delaminated areas, where removal of the delaminated material exposed the edges of the coating still in place, were ground down, cleaned and sealed with a 4 inch to 6 inch wide strip of Phenoline 368 to prevent water seepage under the paint coats.

In addition to the interim repairs, the following listed tests are being conducted to establish the failure causes:

1. Tests, presently in process, are being carried out by the Carboline Company and the paint contractor to try to duplicate the failures and thereby establish the causes.

2. Numerous coating samples have been removed and are being analyzed.

3. Fifteen test coupons, each 2 inch by 4 inch, painted on both sides to a thickness of 15 mils with Phenoline 368 have been installed in various locations of the torus. This test is to determine if increased coating thickness (original coating about 10 mils) will retard the failures.

4. Small isolated areas on the torus walls were sandblasted to bare metal to determine corrosion rates below and above the water.

5. Instrumentation is being installed in the torus which will continually measure the torus air temperature and the suppression pool water temperature. Seven additional areas are being monitored, one above water and six below water at various levels and locations.

6. Facilities have been installed, through two unused drain flanges on the bottom of the torus, to periodically remove samples of the torus water to analyze for chemicals and cleanliness.

The repairs made to the torus paint are, in our opinion, those which give us the highest confidence level that the paint in the torus will remain intact during the next operating cycle.

We are convinced through numerous inspections of the blisters that the coating over the blisters will not deteriorate during the next operating cycle. Although the blisters might increase in size by a small amount, they will remain firm, tight, and intact.

The exposed prime coat remaining after removal of the separated material in the areas of large delaminations under water will gradually reduce in thickness. Leaving the primer exposed in this manner, and at this point in time, is considerably more reassuring than if these relatively large areas were recoated before the cause of the delaminations is determined. However, we are confident that the small patched areas will not separate because similar patching of small areas made previously remain in excellent condition.

During the next scheduled refueling outage we will drain the torus and make a thorough inspection of the paint. In the interim period, the AEC, both Staff and Compliance, will be kept informed of all developments regarding the torus paint.