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 AUTH. NAME AUTHOR AFFILIATION
 MILLS, L.M. Tennessee Valley Authority
 RECIP. NAME RECIPIENT AFFILIATION
 O'REILLY, J.P. Region 2, Atlanta, Office of the Director m/1

SUBJECT: Fourth interim deficiency rept re water found in rock anchor tendon head protective grease cans. Ground water pumped from 23 holes in Unit 1 tendon gallery. Floor pumps will be installed permanently in Units 1 & 2 galleries.

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 TITLE: Construction Deficiency Report (10CFR50.55E)

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TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

September 24, 1980

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - WATER FOUND IN ROCK ANCHOR TENDON
HEAD PROTECTIVE GREASE CANS - NCR 1005 - FOURTH INTERIM REPORT

On May 23, 1979, R. W. Wright, NRC-OIE Region II, was informed that the subject nonconformance was determined to be reportable in accordance with 10 CFR 50.55(e). This was followed by our interim reports dated June 22 and November 23, 1979, and March 21, 1980. Enclosed is our fourth interim report. Because over one year of actual testing will be required to obtain realistic results from the corrosion tests, we expect to submit our next interim report on August 22, 1981.

If you have any questions concerning this matter, please get in touch with D. L. Lambert at FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure

cc: Mr. Victor Stello, Jr., Director (Enclosure) ✓
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
WATER FOUND IN ROCK ANCHOR TENDON HEAD PROTECTIVE GREASE CANS
NCR 1005
10 CFR 50.55(e)
FOURTH INTERIM REPORT

Description of Deficiency

Inspection of approximately 20 (10 randomly chosen on each unit) rock anchor tendon head protective grease cans indicates ground water is infiltrating up along the grouted tendon through the group hole in the shim stack and into the grease cans. The grease cans are filled with grease to protect the tendons and anchorheads from corrosion. Any water entering the grease cans has the potential for causing corrosion problems. No other TVA plants have a prestressed tendon system.

Interim Progress

To decrease the amount of ground water infiltrating into the grease can, TVA began pumping ground water from 23 holes located in the unit 1 tendon gallery floor in an effort to lower the ground water level in the area of the tendons. These holes are approximately 52-feet deep and were drilled through the floor of the tendon gallery into the rock below. Based on a program set up to monitor the ground water level in the grease cans, it has been determined that pumping of water from the holes will keep most ground water out of the grease cans. Because of the success in unit 1, pumps will be installed permanently in both the unit 1 and unit 2 tendon galleries. Drilling in the unit 2 tendon gallery for pumping of ground water is scheduled to begin after the unit 2 vertical tendons are installed and stressed.

Because pumping of the dewatering holes does not completely eliminate all infiltrating ground water, TVA will place rubber membranes around each rock anchor tendon anchorhead in both the unit 1 and unit 2 tendon galleries. The membranes will confine the infiltrating ground water to a small area where it can be monitored after the grease can is installed.

TVA will perform the following tests to establish that adequate protection of the tendons and anchorheads is provided.

1. Determine the effects of the grease on the pH of the ground water
2. Establish the degree of protection that the grease coating provides to the anchorheads and buttonheads in a ground water environment
3. Establish the degree of corrosion to be expected on the tendons, anchorheads, and the buttonheads when exposed to a ground water environment having a pH of 8 to 10

TVA will implement surveillance programs to ensure that any possible corrosion of the tendons and anchorheads will not go undetected. These programs will include:

1. Inspection of the dewatering holes in the tendon gallery of both units to determine if ground water has reached the top of the holes indicating possible pump malfunction.
2. Inspection of the membranes to determine the amount of ground water, if any, that is infiltrating into the area beneath the membranes. This program will begin after greasing operations on the vertical tendons is completed and will continue for a period of 90 days at which time the results will be reviewed.
3. Inservice inspections of the tendons and anchorheads as required by the Nuclear Regulatory Commission's Regulatory Guide 1.35. Samples selected for this inspection will include those tendons having the greatest potential for corrosion from ground water based on results obtained from monitoring the rubber membranes. Before coupling the tendons, TVA will perform a final visual inspection of the anchorhead and buttonheads for each tendon to verify that no detrimental corrosion is present. The actual condition of each anchorhead and its associated buttonheads will be documented.

The tests outlined above have not been started at this time; however, TVA is establishing requirements for the testing program.