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 O'REILLY, J.R.                    Region 2, Atlanta, Office of the Director

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SUBJECT: Second interim deficiency rept, originally reported on 800923  
 re raised buttonheads on rock anchor tendons. Insp revealed  
 some wire in Group I tendons overstressed & buttonheads in  
 Group II oversized. Next rept will be submitted by 810428.

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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

December 29, 1980

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GENERAL SERVICES  
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U.S. NUCLEAR REGULATORY COMMISSION

Mr. James R. 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 - BUTTONHEADS ON ROCK  
ANCHOR TENDONS - NCR 1257 - SECOND INTERIM REPORT

The subject nonconformance was initially reported to NRC-OIE  
Inspector R. W. Wright on September 23, 1980, in accordance with  
10 CFR 50.55(e). This was followed by our first interim report  
dated October 23, 1980. Enclosed is our second interim report.  
We expect to submit our next written report by April 28, 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  
BUTTONHEADS ON ROCK ANCHOR TENDONS  
NCR 1257  
10CFR50.55(e)  
SECOND INTERIM REPORT

Description of Deficiency

Inspection of the rock anchor tendon anchorheads in unit 1 indicates some of the tendon wire buttonheads may not be properly seated on the anchorhead. Buttonheads have been found raised approximately 1/8 inch higher than they should be. Raised buttonheads can be an indication of a broken or overstressed wire, double buttonheading caused by a slip of the buttonheading machine, or buttonheads that are bearing on adjacent buttonheads.

Interim Progress

The 185 unit 1 rock anchor tendons have been inspected, and the inspection reveals 33 tendons had one or more raised buttonheads as follows:

- |     |  |   |          |
|-----|--|---|----------|
| (A) | 19 tendons had one raised buttonhead   | ) |          |
| (B) | 6 tendons had two raised buttonheads   | ) | Group I  |
| (C) | 4 tendons had three raised buttonheads | ) |          |
| (D) | 2 tendons had four raised buttonheads  | ) |          |
| (E) | 1 tendon had six raised buttonheads    | ) | Group II |
| (F) | 1 tendon had nine raised buttonheads   | ) |          |

For purposes of clarity, it is convenient to group the 29 tendons referenced in items A through C as group I, and those in items D through F group II.

Double buttonheads are permitted and were inspected for diameter but were not inspected for buttonhead height. It is not possible to grip the raised buttonheads to see if the wire is loose. A review of the buttonheading cards indicated there is no direct correlation between double buttonheads and raised buttonheads for each affected tendon. On items E and F (the tendons that had six and nine raised buttonheads), there were four and six double buttonheads, respectively.

The group I tendons (that have three or less raised buttonheads) will not be reinspected. Each wire of group I will be conservatively considered to have failed and the tendon stresses will be reduced according to the percentage of raised buttonheads to prevent any possible overstress.

The group II tendons (all having greater than three raised buttonheads) were reinspected to determine if the buttonheads were seated or unseated. Item F (the tendon having nine raised buttonheads) was reinspected and found to have only seven raised buttonheads. These seven buttonheads had an oversized diameter and were resting on adjacent buttonheads. The buttonheads were not loose and were determined to be bearing on adjacent buttonheads by the use of a feeler gauge.

For the other three tendons in group II (items D and E), the reinspections determined the following:

1. Tendon having six raised buttonheads (item E) - All raised buttonheads had an oversized diameter and were seated on adjacent buttonheads.
2. Tendons having four raised buttonheads (item D) - One tendon has four oversized diameter buttonheads bearing on adjacent buttonheads. The other had two oversized diameter buttonheads bearing on adjacent buttonheads and two double buttonheads seated on the anchorhead.

The raised buttonheads that are bearing on adjacent buttonheads are not properly seated on the anchorhead. For the raised buttonheads for these group II tendons, the wires are considered acceptable because the buttonheads of these wires had an oversized diameter and were effectively seated on adjacent buttonheads as indicated by the feeler gauge testing. The tendon stresses in these vertical tendons coupled to the rock anchor tendons need not be adjusted during the containment prestressing because the four group II tendons (tendons with the greatest number of raised buttonheads) were reinspected and no wire failure was found.

The inspection of unit 2 tendons will be performed concurrent with the contractor's installation of unit 2 vertical tendons.