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TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

November 1, 1983

BLRD-50-438/82-35
BLRD-50-439/82-32

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - OPERATIONAL DEFECTS IN HIGH-PRESSURE INJECTION NOZZLES AND THERMAL SLEEVES - BLRD-50-438/82-35, BLRD-50-439/82-32 - FIFTH INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Don Quick on April 29, 1982 in accordance with 10 CFR 50.55(e) as NCR BLN NEB 8206. This was followed by our interim reports dated June 1 and July 28, 1982 and March 1 and April 11, 1983. Enclosed is our fifth interim report. We expect to submit our next report by May 18, 1984. We consider 10 CFR Part 21 applicable to this deficiency.

If you have any questions concerning this matter, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills
L. M. Mills, Manager
Nuclear Licensing

Enclosure

cc: Mr. Richard C. DeYoung, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center (Enclosure)
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

Mr. R. J. Ansell (Enclosure)
Bellefonte Project Services
Babcock & Wilcox Company
P.O. Box 1260
Lynchburg, Virginia 24505

ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
OPERATIONAL DEFECTS IN HIGH-PRESSURE INJECTION NOZZLES AND THERMAL SLEEVES
NCR BLN NEB 8206
BLRD-50-433/82-35, BLRD-50-439/82-32
10 CFR 50.55(e)
FIFTH INTERIM REPORT

Description of Deficiency

Recent inspections at several B&W operating plants revealed defects in the makeup/High Pressure Injection (HPI) nozzles and their thermal sleeves and in the makeup piping upstream of these nozzles. The nozzles are located on each reactor coolant cold leg between the reactor coolant pump and reactor vessel. The nozzles and sleeves are supplied by B&W under the Nuclear Steam Supply System (NSSS) contract. The defects include:

- . through-wall circumferential crack at the welded joint between the nozzle safe end and the first check valve upstream of the safe end
- . loose thermal sleeves
- . missing or worn thermal sleeve retaining buttons

The loose thermal sleeves and missing or worn retaining buttons remove the mechanical restraints which were designed to avoid exposing the nozzle and pipe to a thermal shock condition by preventing sleeve movement in the upstream direction.

Although the degraded components at the affected plants were the same, the resulting damage was not identical. Accordingly, B&W is investigating this concern to determine its cause and to determine if it has generic implications for other B&W plants, including Bellefonte. The Bellefonte nozzle configuration is similar to that at the affected plants except that it is a one-piece construction while the nozzles for the affected plants have a welded safe end. B&W has notified TVA of no similar potential deficiencies in the past for other Bellefonte NSSS nozzles. There are no implications for other TVA plants.

Interim Progress

The sleeve rerolling which was discussed in our fourth report has been completed per field change packages FCP-211 and FCP-212 for units 1 and 2, respectively. Interim report No. 4 outlined TVA's concerns about the adequacy of the fix for the life of the plant. These concerns and B&W's responses are documented in B&W letter D-4698 dated August 3, 1983. B&W's responses do not completely resolve TVA's concerns. To resolve the remaining concerns, we have requested B&W's response to the following questions:

1. Thermal sleeve/nozzle interface load should be maintained through the complete set of design life transients. Was this demonstrated by running the 177 FA plant mock-up test through several thermal cycles, or was the test run for only one cycle?
2. After rerolling the sleeve for Bellefonte nozzle 1-P1B1, gaps remained in two areas approximately 180 degrees circumferentially apart. B&W believes the gaps were caused by local depressions on the nozzle bore resulting from excessive grinding of weld buildup from the inboard end of the nozzle during shop fabrication. B&W considers the thermal sleeve collar configuration to be tight, and therefore, to be acceptable as is. Has B&W determined that these gaps will not result in sleeve bypass flow? If some bypass flow is expected to occur during thermal transients, should the effect of this flow on the exposed portion of the nozzle be evaluated?

TVA will submit a final report on this deficiency after B&W resolves the above concerns.