



CONNECTICUT YANKEE ATOMIC POWER COMPANY

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June 30, 1987

Docket No. 50-213

B12565

Re: 10CFR50.34

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

Gentlemen:

Haddam Neck Plant
Informational Letter on the Mechanical Design
of Rod Cluster Control Assemblies (RCCAs)

During a telephone discussion with the NRC regarding licensing requirements for startup from the upcoming refueling outage, an informational letter was requested on the mechanical design of the new rod cluster control assemblies. These assemblies will be placed into the core during the end-of-cycle 14 refueling outage. The purpose of this letter is to provide the NRC with this information.

After anomalies were discovered at several other plants, the RCCAs at the Haddam Neck Plant were inspected during the end-of-cycle 13 refueling outage for wear and clad cracking as recommended by Westinghouse. Forty-seven (47) control rods, a full set plus two spares, were examined by utilizing eddy current profilometry. Significant wear and cracking was identified leading to the decision to replace the entire core of RCCAs during the end-of-cycle 14 refueling outage. Five rodlets, one in each of five RCCAs, were shown to have flow induced vibration wear which exceeded the clad wall thickness. Another RCCA was found to have longitudinal cracks near the tips of 13 of the 20 rodlets.

In order to achieve extended RCCA lifetimes, several mechanical design changes were incorporated. These include:

- o a welded and brazed spider replaced by a cast spider,
- o absorber material diameter reduced to .005 inches over the lower 12 inches of the rod
- o stainless steel 304 clad material replaced with the low silicon and phosphorus Inconel 625 and
- o rodlet prepressurization to 465 psig with helium.

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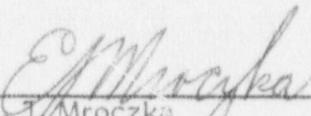
U.S. Nuclear Regulatory Commission
B12565/Page 2
June 30, 1987

It is intended that each change should minimize or curb the effects of the established life limiting phenomenon. The cast spider will provide a more stable configuration to alleviate joint failure between the vane and hub. The reduced diameter Ag-In-Cd absorber in conjunction with rodlet prepressurization will provide a larger gap to accommodate higher silver swelling and reduce clad stresses. Low impurity (silicon and phosphorous) concentration in the Inconel is designed to improve the susceptibility of the clad to intergranular stress corrosion cracking. In addition, the higher hardness exhibited by the Inconel is intended to reduce flow induced vibration wear.

The remainder of the Inconel RCCA design can be classified as equivalent to the original steel design. The mechanical aspects are comparable. As a result, the design changes do not alter or modify the current Haddam Neck Plant basis or require any changes to the Technical Specifications.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY



E. J. Mroczka
Senior Vice President

cc: W. T. Russell, Region I Administrator
F. M. Akstulewicz, NRC Project Manager, Haddam Neck Plant
P. D. Swetland, Resident Inspector, Haddam Neck Plant