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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

September 26, 1980

Docket No. 50-213

Mr. W. G. Council, Vice President  
Nuclear Engineering and Operations  
Connecticut Yankee Atomic Power Company  
Post Office Box 270  
Hartford, Connecticut 06101

Dear Mr. Council:

RE: SEP TOPIC III-10.B REACTOR COOLANT PUMP FLYWHEEL INTEGRITY

Enclosed is a copy of our evaluation of Systematic Evaluation Program Topic III-10.B, Reactor Coolant Pump Flywheel Integrity. This assessment compares your facility, as described in Docket No. 50-213, with the criteria currently used by the regulatory staff for licensing new facilities. Please inform us if your as-built facility differs from the licensing basis assumed in our assessment within 60 days of receipt of this letter.

This evaluation will be a basic input to the integrated safety assessment for your facility unless you identify changes needed to reflect the as-built conditions at your facility. This topic assessment may be revised in the future if your facility design is changed or if NRC criteria relating to this topic is modified before the integrated assessment is completed.

Sincerely,

*Dennis M. Crutchfield*  
Dennis M. Crutchfield, Chief  
Operating Reactors Branch #5  
Division of Licensing

Enclosure:  
Completed SEP  
Topic III-10.B

cc w/enclosure:  
See next page

Mr. W. G. Council

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SYSTEMATIC EVALUATION PROGRAM  
PLANT SYSTEMS/MATERIALS  
HADDAM NEC. PLANT

TOPIC III-10.B PUMP FLYWHEEL INTEGRITY

The safety objective of this review is to assure that the integrity of the primary reactor coolant pump flywheel is maintained to prevent failure at normal operating speeds and speeds that might be reached under accident conditions and thus preclude the generation of missiles.

Information for this assessment was obtained from the Facility Description and Safety Analysis Report (FDSAR), Technical Specifications and Inservice Inspection Reports by Westinghouse Electric Company dated January 30, 1974, July 30, 1975, August 6, 1976, January 12, 1978, and March 18, 1979, for the Haddam Neck plant.

The basis for the review is to determine compliance with the recommendations of Regulatory Guide 1.14, "Reactor Coolant Pump Flywheel Integrity." This guide describes and recommends a method acceptable to the NRC staff for implementing General Design Criterion 4, "Environmental and Missile Design Bases" of Appendix A to 10CFR Part 50, with regard to minimizing the potential for failure of the flywheels of the reactor coolant pump motors.

There are two parts to the recommendations of Regulatory Guide 1.14. The first part is related to the evaluation of materials of construction, design, fabrication, proof testing, and pre-service inspection of the pump flywheels for construction permit submittals docketed on or after January 1, 1976. The second part is concerned with the evaluation of procedures used for the inservice inspection of pump flywheels for all plants after January 1, 1976.

The regulatory position for the inservice inspection of the reactor pump flywheels for the Haddam Neck plant is that the inservice inspection of each flywheel should be performed in compliance with the recommendation of Section D.2 of Regulatory Guide 1.14 as follows:

- a. In-place volumetric examination of areas of higher stress concentration at approximately three year intervals;
- b. Surface examination of all exposed surfaces and a complete volumetric examination at approximately ten year intervals;
- c. The examination procedures should comply with Subarticle IWA-2200 (ASME Section XI);
- d. Acceptance criteria should be that the lowest critical speed is calculated to be twice the normal operating speed, and

- e. Should the examination indicate an increase in flaw size greater than predicted for the service life, the results should be submitted to the regulatory staff for evaluation.

The design of the reactor pump is shown in Figure 5.1.4-4 of the FDSAR and the flywheel is described in Section 5.1.4.2 of the FDSAR as follows:

A flywheel, mounted above the motor rotor, provides the inertia necessary to maintain flow for a period sufficient to dissipate the stored and decay heat in the core upon loss of alternating current power. The inertia of the rotating assembly is approximately 45,000 lb-ft. The flywheel has six pawls mounted on its outer rim in such a way that when the flywheel stops, the pawls drop and engage ratchet teeth on a stationary ring. This prevents reverse rotation of the pump and limits backflow of reactor coolant through the pump.

The Inservice Inspection Program for the Haddam Neck plant is described in Table 4.10.1 of the Technical Specifications. Referring to Item No. 7.1 in the table, one different flywheel shall be examined visually and 100% volumetrically at every other refueling shutdown. Details of the procedures for examination are described in Section H (ISI-8 and ISI-41) of the Inservice Inspection Report (Westinghouse) dated March 18, 1979.

We conclude from our review that the Inservice Inspection Program for the reactor coolant pump flywheel for the Haddam Neck plant does not comply with the recommendation of Regulatory Guide 1.14, "Reactor Coolant Pump Flywheel Integrity." We recommend that in-place volumetric examination of areas of higher stress concentration be performed on all flywheels at approximately three-year intervals and that surface examination of all exposed surfaces and a complete volumetric examination be conducted on all flywheels at approximately ten-year intervals.