



CONNECTICUT YANKEE ATOMIC POWER COMPANY

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September 3, 1982

Docket No. 50-213
B10550

Director of Nuclear Regulation
Attn: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

- References:
- (1) W. G. Council letter to D. L. Ziemann dated, March 25, 1980.
 - (2) D. M. Crutchfield letter to W. G. Council, dated February 26, 1981.
 - (3) W. G. Council letter to D. M. Crutchfield, dated August 6, 1981.
 - (4) D. M. Crutchfield letter to W. G. Council, dated October 5, 1981.

Gentlemen:

Haddam Neck Plant
Reactor Coolant Pump Inspection Program

In Reference (1) Connecticut Yankee Atomic Power Company (CYPACO) requested that the NRC grant relief, on a temporary basis, from the ASME Boiler and Pressure Vessel Code, Section XI, Summer, 1975 Addendum for certain volumetric and visual examinations of a reactor coolant pump casing. Via Reference (2), the Staff granted relief which deferred the examinations until the 1981 refueling outage.

In Reference (3), CYAPCO requested that the subject inspection program be further deferred to the spring 1983 refueling. CYAPCO stated that a pump inspection program during the 1981 outage would result in significant hardships. The staff provided relief to this inspection via Reference (4).

At the present time, CYAPCO wishes to request permanent relief from the requirements of Table IWB-2500 of the ASME Code, Section XI, examination categories B-L-1 and B-L-2. These requirements are:

Category B-L-1: The volumetric examinations performed during each inspection interval (10 years) shall include 100% of the pressure-retaining welds in at least

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one pump in each group of pumps performing similar functions in a system. The examinations may be performed at or near the end of the inspection interval.

Category B-L-1: The volumetric examinations performed during each group of pumps performing similar functions in the system shall be visually examined during each inspection interval. This examination may be performed on the same pump selected for the Category B-L-1 examination. The visual examination may be performed at or near the end of the inspection interval.

An ongoing commitment of the ASME Boiler and Pressure Vessel Code, Section XI (Inservice Inspection) has been to review required examinations. A program to re-evaluate code requirements is now in place and the emphasis will be on establishing new rules for examination of stainless steel piping, reactor vessels, reactor coolant pumps, and bolting. The inspections completed are building an information base which is intended to serve as a basis for future code revision. The NRC Staff has expressed interest in this re-evaluation of code examination requirements as it would alleviate the burden of dispositioning individual annual code exemption requests. If these code revisions are implemented as currently envisioned, this exemption would be unnecessary. Since the code requirements have not as yet been amended, CYAPCO is requesting relief as described below.

CYAPCO evaluation has determined that the hardships that must be endured to perform this inspection are not justified on a technical basis for the following reasons:

- o The reactor coolant pump casing consists of four Type 316 stainless steel cast rings with minimum thickness of approximately eight inches. Considering the stainless steel Type 316 characteristics and the water chemistry limitations for the reactor coolant system, the potential for any stress corrosion mechanism is considered to be negligible.
- o Thermal embrittlement is a function of ferrite content in duplex cast stainless steels. Connecticut Yankee's casing material is made of CF-8M (316 S. S.) with a maximum ferrite content on the order of 15-25 percent, based on industry standards. Using EPRI data for cast austenitic stainless CF-8 (304 S. S.) and a maximum ferrite level of 25 percent for the specific CY CF-8M RCP casing, the minimum time required for thermal embrittlement to lower the Charpy-V-Notch toughness below 50 joules (37 ft.-lbs.) is 36 years. Therefore, adequate fracture toughness will be retained over the lifetime of the plant, thereby eliminating potential nonductile fracture concerns.
- o Service induced flaws would more likely be generated from a cyclical loading mechanism such as fatigue. However, the pump bowl geometry as well as endurance limit of the given material make this a negligible concern.

- o The examinations completed on four Westinghouse model 93 pump casings have shown that no detectable interior service-induced flaws have occurred. The CYAPCO pumps are Westinghouse Model 63 pumps, which is a smaller and similar version of the model 93.
- o Disassembly of the pump for inspection could result in significant damage as the pumps were designed prior to ISI requirements and ease of disassembly in the field was not part of the design basis.
- o Radiation levels will be very high, estimated at 60-80 rem/hr. at the pump impeller prior to decontamination.

Actual man-rem for removal, decontamination, storage, radiography, replacement, insulation, and general support at the three plants that have completed their pump examination are as follows:

Ginna- 93.071

Turkey Point- 43.67

Point Beach- 36.5

- o At the Haddam Neck Plant total exposures for this RCP examination effort of 50-100 man-rem are considered probable. The radiation exposure at the Haddam Neck Plant for ISI work in 1980 was 48.908 man-rem and in 1981 was 41.582 man-rem. The RCP casing examination, if conducted, would cause this figure to more than double.
- o The reactor coolant pumps have performed satisfactorily at Haddam Neck Plant. No operational problems have been encountered which have required disassembly of a reactor coolant pump.
- o The pump inspection is not justified from a cost/benefit perspective. The pump disassembly, inspection, and reassembly is estimated to cost \$500,000. The dollar value associated with the radiation exposure required to perform this work is \$105,000 (50 man rem valued at \$2100 per man rem). The dollar per man-rem value is based upon guidelines presented in NU Corporate ALARA Manual. The total examination cost is therefore in excess of \$600,000. This cost is not justified in light of the lack of improvement in safety provided by this examination. These costs exclude the expenditures associated with any unique decontamination process, if a feasible process is found to be available.

The imposition of this requirement will result in technical and financial hardships and unusual difficulties without a compensating increase in the level of quality or safety associated with the reactor coolant pumps. A vibration monitoring system has been installed on the reactor coolant pumps, and is providing on-line monitoring of the pump's mechanical condition. In addition, more comprehensive vibration data are taken on all four reactor coolant pumps prior to shutdown for refueling. We are, therefore, confident that a progressing mechanical malfunction will be detected before failure.

In summary, confidence in the safe condition of the existing pumps, the significant radiation exposure, the potential of damaging pump components during disassembly and reassembly, the lack of benefit to plant integrity and the significant expense in both dollars and time have led CYAPCO to conclude that pump casing examinations as required by the ASME Code using existing techniques are not justifiable.

Therefore, pursuant to 10CFR50.55a(g) (6) (i) and 50.12(a), CYAPCO requests that the Commission grant relief from the B-L-1 and B-L-2 examinations (volumetric and interior surface). CYAPCO has concluded that such relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon CYAPCO that would result if the inspection requirements were imposed.

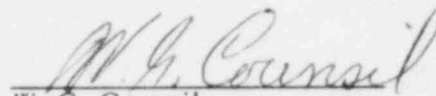
If problems are encountered with reactor coolant pumps which necessitate a pump disassembly and casing examination, CYAPCO will perform a visual inspection of the pump interior and re-evaluate the need for the radiographic examination of the pump casing welds. As an alternate to the B-L-1 and B-L-2 examinations, CYAPCO will continue to visually inspect the pump casings in accordance with IWA-5000 and IWB-5000 during the performance of system pressure tests during the upcoming outage, and perform a surface examination of the exterior surface of the welds as required by Section XI (Winter 80 Addendum).

CYAPCO has reviewed the above referenced request pursuant to the requirements of 10CFR170, and has determined that the request constitutes a Class III exemption. Accordingly, enclosed herewith is payment in the amount of \$4,000 (four thousand dollars). The basis for this determination is that the requested exemption involves a single safety issue, and does not involve a significant hazards consideration.

In that the Haddam Neck Plant is scheduled to begin its refueling outage on January 22, 1983, CYAPCO requests that the Staff give this matter prompt consideration. A formal response is requested by November 3, 1982.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY



W. G. Council
Senior Vice President

cc: V. Stello, Jr.