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September 27, 1982

Docket No. 50-213
B10541

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

Gentlemen:

Haddam Neck Plant
SEP Topic III-6, Seismic Design Considerations

On June 22 and 23, 1982, meetings were held between Connecticut Yankee Atomic Power Company (CYAPCO) representatives, NRC Staff, NRC consultants (EG&G), and CYAPCO consultants (Westinghouse, Stevenson and Associates), to discuss the status of the Haddam Neck seismic reevaluation program. At the conclusion of these meetings, the NRC provided CYAPCO with a handwritten summary of comments and open items concerning the reevaluation program. The purpose of this submittal is to respond to the open items identified by the NRC and their consultants.

The NRC concluded that seismic reanalysis efforts for equipment were deficient in three areas:

- a) All equipment required for safe shutdown and ECCS has not been included
- b) Instrument and control reevaluation to assure that adequate parameters are available to the plant operator are not included
- c) Air systems and air operators necessary to insure that necessary safety functions are met are not included

CYAPCO Response

a) Scope of Seismic Reanalysis

The scope of the seismic reanalysis effort for mechanical and electrical equipment presently involves detailed analyses of 18 major mechanical components and 13 major electrical components. This is reflected in Table 2-1 of Attachment I, "Interim Report - Mechanical and Electrical Equipment - Seismic Reevaluation Program - Haddam Neck Nuclear Generating Station". The selection of components for detailed evaluation was performed following an in-situ inspection and compilation and categorization of all safe-shutdown and ECCS equipment. Equipment was grouped into the following categories:

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- (a) Tanks and vessels.
- (b) Heat exchangers.
- (c) Pumps.
- (d) Electrical Equipment Racks.
- (e) Electrical Cabinets.
- (f) HVAC equipment.
- (g) HVAC duct.

At least one component from each category will be evaluated in detail as part of the program. Results of the detailed evaluations of these components will be submitted to NRC by January 1, 1983. CYAPCO will assess the seismic adequacy of the remainder of the critical mechanical and electrical components using the following approaches.

1. Sound Engineering Judgement

Seismic analysis performed by or reviewed by consultants to CYAPCO have identified classes or types of components which possess inherent seismic capabilities well beyond the design basis of the Haddam Neck Plant and east coast seismic potentials. Assessments of these type of components using engineering judgement and/or limited evaluations will be performed where technically justified.

2. Similarity Methods

The results of the detailed analyses performed will be used where justified to assess the adequacy of similar components. An example of an area where this is expected to be used is to evaluate the anchorage and structural integrity of motor control centers (MCC's). A detailed finite element analysis of one MCC coupled with in-situ testing of all vital MCC's will be used to assess the adequacy of the remaining safety-related MCC's.

3. Detailed Seismic Analyses

In cases where approaches 1 or 2 are not considered technically justifiable, CYAPCO will perform detailed evaluations of additional components to assess their seismic adequacy. Engineering judgement and/or similarity assessments may be used to limit the scope of the assessment to the aspects considered critical (e.g., anchorage of a component). These evaluations are scheduled for completion by July 30, 1983.

b) Instrumentation and Controls

An assessment will be made of the seismic adequacy of critical instrumentation and control equipment necessary to provide sufficient parameters to the plant operators during safe shutdown conditions or ECCS operation. This evaluation will address structural integrity and stability only. Consideration will be given to addressing the operability of this equipment within the SEP Owners Group program on seismic qualification of Class IE electrical equipment.

c) Air Systems

An evaluation of the need for air supply systems during safe shutdown and ECCS operation will be performed. Necessary air supply systems will be evaluated for seismic effects by July 30, 1983. Air operated valves will be evaluated to determine their safety function. Safety functions will be categorized into three areas:

1. Needed only for pressure boundary retention.
2. Fail safe via spring actuation upon loss of air.
3. Require air supply to move to safe position.

Assessments will be made of the seismic adequacy of these valves by July 30, 1983.

Resolution of Open Items

Five open items were identified by the NRC. CYAPCO's intended resolution of these items are detailed below.

1. A report on the balance of plant piping results should be submitted to the NRC by the end of August 1982.

CYAPCO Response

CYAPCO will send a summary report on balance of plant piping analysis results to the NRC by October 29, 1982. As indicated during the meetings, piping analyses are not scheduled for completion until December 30, 1982. As such, the report to be submitted during October 1982 will focus on analytical methods and procedures and summarize the extent of anticipated modifications. The report will be based on preliminary analyses and will be followed with updates reflecting changes made during construction or as analyses are finalized.

Support modifications in accessible areas are scheduled to begin on or about October 15, 1982. Although modifications in these areas will be expedited, completion of this effort is not expected before June 1983.

For areas considered inaccessible during normal plant operation, support modifications are expected to be completed during the refueling outage scheduled for the first quarter of 1983.

2. A report on the five items presented by Stevenson and Associates on June 22, 1982, should be submitted to the NRC by the end of July 1982.

CYAPCO Response

This report is included as Attachment I. The report is organized in the format which will be used for the final report on seismic qualification of mechanical and electrical equipment. CYPACO requests NRC review and comments on the format and content of the interim report such that the final report can address any comments. Preliminary results to date indicate that provided proper anchorage and support are provided for these components, the installed configurations are adequate to assure safe shutdown capability in the event of an SSE.

3. The plan and schedule for reanalysis of the remaining equipment should be submitted to the NRC within thirty days.

CYAPCO Response

See items a), b), and c), above.

4. Within thirty days CYAPCO's intended action to ensure a water source is available for decay heat removal and primary system makeup following the postulated SSE should be submitted to the NRC.

CYAPCO Response

The reevaluations of the refueling water storage tank (RWST) and demineralized water storage tank (DWST) have indicated that the anchorages of these tanks are not capable of resisting SSE loadings based on current analysis methods. It should be noted that even in the event of failure of the tank anchorage during an SSE, loss of function of the tank may not occur. Tension forces leading to failure of the anchorage may be transmitted from the lower shell course to the tank bottom without a significant failure of the tank fluid retention capability. Demonstration of this process would require a detailed non-linear finite element analysis of the tanks. In lieu of this evaluation, CYAPCO intends to modify the tank anchorage systems to accommodate conservatively calculated SSE loadings. Installation of these modifications is scheduled for completion by June 30, 1983.

Even in the unlikely event of failure of either of the demineralized water storage tank or the refueling water storage tank during a postulated SSE, sufficient alternate shutdown methods exist. Normal shutdown methods using normal feedwater drawing from the hotwell can be used provided off-site power remains available. Alternatively, a feed and bleed method of core cooling could be utilized even in the event of failure of both tanks. This would involve the use of blended makeup to compensate for RCS shrinkage during cooldown using water from either the primary water storage tank, primary recycle water storage tank, or well water in conjunction with concentrated boric acid from the boric acid mix tank. This makeup would subsequently be recycled from the containment sump using normal ECCS procedures for the recirculation mode of core cooling.

5. Soil properties for the evaluation of the field erected tanks, buried tanks, and buried piping should be submitted to the NRC. Justify the modeling in conjunction with these soil properties.

CYAPCO Response

CYAPCO has recognized the uncertainties existing in the foundation properties of soil founded components. The potential impact of these uncertainties has been factored into the seismic reevaluations performed to date and will also be addressed in future evaluations where significant. An example of the treatment of soil related effects is given in analyses for the refueling water storage tank included in Attachment 1.

Questions Regarding Reactor Coolant System Analyses

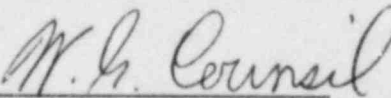
The NRC requested a meeting in early August between representatives from the NRC, Westinghouse, and CYAPCO at Westinghouse offices. The intent of the meeting was to discuss details of Westinghouse analytical methods used for the Haddam Neck RCS reanalyses and the results of the analyses performed to date. This meeting was held on August 12, 1982.

The NRC also requested CYAPCO to define the "intended actions regarding the identified overstresses in the pressurizer truss supports and the reactor coolant pump hanger." CYAPCO will utilize conceptual modifications developed by Westinghouse coupled with a field inspection at the next scheduled refueling outage (February 1983) to develop finalized modification details for the identified overstresses. These modifications would be installed at the following (1984) refueling outage.

We trust the Staff will find this information sufficient to resolve any concerns related to these portions of the seismic reevaluation program.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY


W. G. Council
Senior Vice President