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October 31, 1996
Docket No. 50-213
B15953

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Haddam Neck Plant
Request for Information Concerning Porous Concrete Sub-Foundation

The purpose of this letter is for Connecticut Yankee Atomic Power Company (CYAPCO) to respond to a request for information transmitted by letter dated October 18, 1996.⁽¹⁾ The NRC Staff requested a response to five questions related to cement erosion under containment foundations. It is our understanding this information is needed to evaluate the potential generic implications of the erosion of cement from under the containment foundation basemat which has been found at Millstone Unit 3.

CYAPCO has concluded that there has been no evidence of cement erosion from under the containment basemat. The responses to the five questions are provided in Attachment 1. In addition to the information provided in Attachment 1, a review of the Fuel Storage Building (FSB) was performed. The FSB is located on the east side of the Reactor Containment Building and has two foundation structures. The new fuel storage area uses a spread footing type foundation, while the spent fuel storage pit has a six foot thick foundation mat. Unlike the Reactor Containment Building, the foundation of the FSB was placed directly on the bedrock. Porous concrete was not used under the FSB.

(1) Stephen Dembek letter to Ted C. Feigenbaum, "Request for Information Concerning Porous Concrete Sub-Foundation," dated October 18, 1996.

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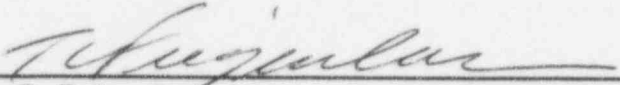
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If you should have any questions on the information contained herein, please contact Mr. G. P. van Noordennen at (860) 267-3938.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY



T. C. Feigenbaum
Executive Vice President and
Chief Nuclear Officer

cc: H. J. Miller, Region I Administrator
S. Dombek, NRC Project Manager, Haddam Neck Plant
W. J. Raymond, Senior Resident Inspector, Haddam Neck Plant

Attachment 1

Haddam Neck Plant

Response to Request for Information

Cement Erosion under Containment Foundation

October 1996

Response to Request for Information
Cement Erosion Under Containment Foundation

Question (1): Have you found slurry in the drainage from the porous concrete layer below the containment basemat?

Response (1): The water leaching out from the External Containment Sump has been surveyed at least monthly for radiological concerns for the past ten years. During those inspections, there was no indication of slurry found or reported in the drainage. There are two pumps installed at this sump which automatically pump water out when water level reaches a certain elevation. A recent inspection found no slurry in the drainage area. The water being pumped out was observed to be clear.

Question (2): Has there been any settlement of the containment basemat?

Response (2): The Haddam Neck Plant has not systematically monitored the settlement of the Reactor Containment Building. To date, there have been no reports or findings of any settlement of the Reactor Containment Building. Since the External Containment Sump effluent has not shown evidence of concrete leaching, a settlement monitoring program was not developed. Recent inspections performed inside the Reactor Containment as part of procedure ENG 1.7-147, "Condition Monitoring of Maintenance Rule In Scope Structures," found no evidence regarding concrete settlement, nor any indications of degradation of the concrete slab.

Question (3): Have you noticed any unusual conditions which may be related to the porous concrete sub-foundation layer?

Response (3): There were no unusual conditions reported to date which may be related to porous concrete. As stated in Response (1), there has been no indication of slurry found or reported in the drainage. Also, there has been no indications of containment settlement.

Question (4): Are you monitoring anything related to the drainage from the porous concrete sub-foundation layer(s) below the containment basemat?

Response (4): The only monitoring of the water leaching from the External Containment Sump is the radiological survey performed at least monthly. There is no other monitoring related to the drainage from the porous concrete sub-foundation layer below the containment basemat.

Question (5): Is calcium aluminate (high alumina) cement used as a constituent in the porous concrete mix?

Response (5): CYAPCO specification number CYS-614, "Specification For Placing Concrete and Reinforced Concrete For Connecticut Yankee Atomic Power Plant," contains Table A which tabulates the materials and mix proportioning for concrete used at the HNP. Similar to all cement mix at the HNP, Portland Cement, Type II (low alkali) was used in the porous concrete. Calcium aluminate (high alumina) cement was not used as a constituent in the porous concrete mix. Table A from CYS-614 is attached.

TABLE A
APPROXIMATE PROPORTIONS FOR TRIAL PURPOSES TO ESTABLISH MIXES

<u>Items</u>	<u>Standard Concrete for Structures</u>				<u>Popcorn</u>	<u>Filler</u>
28 day design strength, psi	3,000	3,000	3,000	3,000	1,500	2,000
Maximum size aggregate, in.	3/4	3/4	1 1/2	1 1/2	3/4	3/4
Portland cement, Type II low alkali, lb	494	400	474	376	447	256
Fly ash, lb	-	140		120	-	85
Sand, lb	1,514	1,530	1,090	1,149	-	1,535
Trap rock	1,750	1,750	2,110	2,066	2,480	1,800
Water, gal	30	30	27	25	18	27
Maximum slump, in.	3	3	3	3	3	3
Water-cement ratio	.50	.46	.48	.42	.35	.66
Pozzolith 8AA improved, lb*	1.2	1.4	1.2	1.3	-	.91
Air entrainment agent, oz	4.0	4.0	4.0	-	4.4	
Air required, per cent	4-5	3-5	3-5	-	3-5	

*Pozzolith 8AA is basis for approximate amounts listed. Other approved equal materials such as P.D.A. and Protex by Autolene Lubricants Co., WRDA by Dewey and Almy Chemical Division of W. R. Grace Co., Frioplast by Sika Chemical Corp., and Placewell by Johns-Manville may be used in quantities recommended by manufacturer.