

August 26, 1982

Docket No. 50-213
LS05-82-08-054

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

Dear Mr. Council:

SUBJECT: SEP TOPIC III-3.A, EFFECTS OF HIGH WATER LEVEL ON STRUCTURES
HADDAM NECK PLANT

Enclosed is our final evaluation of SEP Topic III-3.A, Effects of High Water Level on Structures. This evaluation was developed using the Safety Evaluation Report provided by you on August 31, 1981, and other information available from other SEP topics and on Docket No. 50-213.

The evaluation is dependent on water levels developed in SEP Topic II-3.B. Should those water levels change, this topic may have to be revised.

This evaluation will be a basic input to the Integrated Safety Assessment for your facility.

Sincerely,

ORIGINAL SIGNED BY

Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing

SE04

5 DSU USE(02)

ADD:

G. Staley

Enclosure:
As stated

cc w/enclosure:
See next page

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OFFICE	SEP B <i>JP</i>	SEP B <i>SB</i>	SEP B <i>RH</i>	SEP B <i>WR</i>	ORB#5	ORB#5	AD:SA:DL
SURNAME	DPersinko:b	SBrown	RHermann	WRussell	CTropf <i>CT</i>	DCrutchfield	Tippoyito
DATE	8/10/82	8/15/82	8/20/82	8/21/82	8/21/82	8/25/82	8/25/82

OFFICIAL RECORD COPY

Mr. W. G. Council

cc
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ENCLOSURE

HADDAM NECK NUCLEAR POWER PLANT

SEP TOPIC III-3.A

ASSESSMENT OF THE EFFECTS OF HIGH WATER LEVEL
ON STRUCTURES

I. INTRODUCTION AND PURPOSE

The effect of the loadings due to groundwater, high water and waves on seismic Category I structures was reviewed. The purpose of this investigation was to assure that such effects will not jeopardize the structural integrity of any seismic Category I structures, and thus, that equipment located within these structures will be protected.

II. REVIEW CRITERIA

References:

1. 10 CFR to, Appendix A, GDC2.
2. Standard Review Plan, Sections 3.4 and 3.8.
3. Regulatory Guide 1.102.
4. Safety Assessment Report on SEP Topic III-3.A as transmitted to NRC by Connecticut Yankee Atomic Power Company (CYAPCO) letter dated August 31, 1981.
5. Addendum to Safety Assessment Report for SEP Topic III-3.A as transmitted to NRC by CYAPCO letter dated Nov. 23, 1981.
6. Draft TER - C5257-425 for SEP Topics II-3 A, B, B.1, C and III-3B, Haddam Neck NPP, with staff comments dated 6/2/82.

III. RELATED TOPICS AND INTERFACES

SEP Topic II-3.B describes flooding potential and flood protection requirements for the Haddam Neck site.

IV. REVIEW GUIDELINES

The flood effects on structures, as described in references 4 and 5 were compared to current NRC criteria as described in references 1, 2, and 3. The FSAR was reviewed in order to attempt to determine the original design basis. The effects of the flood levels postulated in reference 6 were also considered and are addressed below.

V. EVALUATION

The plant grade at the Haddam Neck site is at an elevation of 21 feet above mean sea level (MSL). The original design basis flood level (DBFL) for the plant is 19.5 feet above MSL. The plant was designed as a "dry site", that is, hydrodynamic loads would not have been considered, except perhaps for intake structures. It is concluded from an examination of the FSAR and references 4 and 5 that all structures were designed to resist hydrostatic loads to the original DBFL. Accordingly, for the original DBFL, of 19.5 feet above MSL the structures would be considered adequate. It is also considered reasonable to assume that plant structures can resist flood loads up to plant grade at 21.0 feet above MSL.

In reference 6, the DBFL is postulated up to 39.5 feet above MSL.

According to the conclusions of reference 6, the following structures should be required to have the ability to resist hydrostatic and hydrodynamic loads, in combination with other loads, up to 39.5 feet above MSL:

- Intake Structure
- Primary Auxiliary Building
- Reactor Containment
- Diesel Building
- Fuel Oil Tank

Of course, any other safety related structures should be required to withstand the higher DBFL also.

There is insufficient structural information presented in references 4, 5, or the FSAR to evaluate the adequacy of plant structures to resist the loads which would be imposed by the flood levels postulated in reference 6. Most nuclear power plant structures can resist sizeable additional loads above original design, and emergency procedures such as intentional flooding can be sometimes used to mitigate the effect of hydrostatic and hydrodynamic loads. However, such an increase in flood levels as postulated in reference 6 dictates that all safety related structures must be re-analyzed in detail to determine their capability to resist the additional loads. Also, it will probably be determined that at least portions of several of these structures will be inadequate and thus modifications will be required.

VI. CONCLUSION

The structural consequences of increasing the DBFL to 39.5 feet above MSL from the original DBFL of 19.5 feet are considered to be significant. From the information available at this time it cannot be determined what the extent of the potential damage from the postulated event could be or what actions would be required to mitigate them.

The licensee should: (1) evaluate all safety related structures to ascertain what their capacities are and propose corrective actions where required, and/or (2) revise emergency procedures to alleviate the structural problems (e.g., internal flooding) and/or (3) demonstrate that the design bases flood should be lower.