CONNECTICUT YANKEE ATOMIC POWER COMPANY

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December 14, 1981

Docket No. 50-213
B10268

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

References: (1) Letter, D. G. Eisenhut to all SEP Licensees, dated July 7, 1981.
(2) Letter, W. G. Counsil to D. G. Eisenhut, dated July 29, 1981

Gentlemen:

Haddam Neck Plant
SEP Topic II-3.A, Hydrologic Description

Reference (1) requested the SEP Licensees to commit additional resources devoted to completion of the SEP. In Reference (2), Connecticut Yankee Atomic Power Company (CYAPCO) committed to develop Safety Assessment Reports (SARs) for certain SEP Topics which would be submitted for Staff review. In accordance with this commitment, CYAPCO hereby provides the Safety Assessment Report for SEP Topic II-3.A, Hydrologic Description, which is included as Attachment 1.

We trust the Staff will appropriately use this information to develop a Safety Evaluation Report for this SEP Topic.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

W. G. Counsil
Senior Vice President

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Docket No. 50-213

Attachment 1

Safety Assessment Report

SEP Topic II-3.A, Hydrologic Description

December, 1981

Haddam Neck Plant

TOPIC II-3A, HYDROLOGIC DESCRIPTION

1.0 INTRODUCTION

The objective of this topic is to assure the designs of structures, systems, and components required for safe shutdown reflect consideration of appropriate hydrologic conditions and identify deficiencies in designs and/or operations that could contribute to accidental radioactive releases.

2.0 CRITERIA

Standard Review Plan Section 2.4.1 states:

> "The descriptions and elevations of safety-related structures, facilities, and accesses thereto should be sufficiently complete to allow evaluation of the impact of flood design bases. Site topographic maps must be of good quality and of sufficient scale to allow independent analysis of pre- and post-construction drainage patterns. All external plant structures and components should be identified on site maps. Data on surface water users, location with respect to the site, type of use, and quantity of surface water used are required."

3.0 DISCUSSION

The Haddam Neck site grade is at elevation 21 MSL. At the back or east side of the plant, wooded hillsides rise steeply above the near vertical rock cut while the Connecticut River acts as a barrier on the west side as well as at the southern end of the peninsula, approximately one mile from the plant.

No public drinking water supplies are taken from the Connecticut River in this area. Industrial water use is limited to cooling purposes. All drinking water is obtained from wells or reservoirs on tributary streams. There are many private wells in the region which draw primarily upon groundwater rather than on springs or other surface sources. The closest well, other than the plant wells mentioned below, is approximately three miles from the plant.

The groundwater table general gradient slopes downward toward the river. Water in the saturated zone under the flood plain occurs as free groundwater or in a leaky aquifier between alluvium on top and bedrock below, or both. Groundwater on the hillsides occurs under a mixture of perched conditions and in minor quantities in cracks in the rocks. The unsaturated zone on the hillsides is relatively thin. Groundwater loading conditions developed at or near grade could conservatively be used for design purposes, i.e., SEP Topic III-3.A.

For the containment building, a layer of porous concrete was placed under the foundation mat to collect groundwater and carry it to an external sump. This drainage system is designed to maintain the groundwater level below the mat, thus minimizing uplift pressures. The containment was designed such that failure of the pumps would not overstress the structure during a simultaneous flood and earthquake (see Topic III-3B).

Approximately six areas were investigated by deep drilling for permanent pumps to supply plant makeup and sanitary service. All except one were "dry," that is, no aquifer was found which would support pumping. One location about 2,400 feet south of the plant site permitted the installation of two permanent pumps. It is believed that the aquifer is supplied primarily from the hillside.

Rains or spills on the ground surface eventually arrive at the river rapidly by overland flow or as groundwater movement at velocities from a few to several hundred feet per day. By pitching all areas to the river or discharge canal, the need for an extensive storm drainage system was precluded. No changes since construction have occurred to alter the drainage system in such a way to create local flooding.

Roof drainage of safety-related structures occurs as follows:

Roof	High Point or Top of Parapet	No. of Drains	Approx. Area ($ft.^2$)	Drain Size	Low Point
Screenwell (Intake)	36' 10"	2	2,260	4"	36' 2"
Service Building	42' 0"	1	2,700	4"	40' 8"
Auxiliary Bay	59'9 3/4"	3	4,455	4"	59' 6"
Control Room	77'8 3/8"	3	5,700	4"	76' 10"
Warehouse	42'	4	11,040	4"	41'4 1/2"
Turbine Building	129'8"	10	27,560	4"	115'2"
New & Spent-Fuel Bldg.	(N/A; direct runoff)				
Primary Aux. Bldg.	(N/A; direct runoff)				
Containment	(N/A; direct runoff)				

The plant roof design live load is 40 psf. Should all the roof drains clog and water be permitted to accumulate, the service building roof (worst case for loading conditions) would have an approximate loading of 42 psf. Based on the above, CYAPCO concludes that the plant has been adequately designed for PMP effects.

3.1 ASSOCIATED SEP TOPICS

- o II-3.B Flooding Potential and Protection Requirements
- o II-3.B.1 Capability of Operating Plant to Cope with DBF Conditions

3.1 ASSOCIATED SEP TOPICS (Continued)

- o II-3.C Safety-Related Water Supply (UHS)
- o III-3.A Effects of High Water Level on Structures
- o III-3.B Structural and Other Consequences of Failure of Underdrain Systems

4.0 CONCLUSIONS

CYAPCO concludes that sufficient information has been compiled on hydrologic considerations to assure that the designs of structures, systems, and components required for safe shutdown reflect consideration of appropriate hydrologic conditions. This information shall be used as the basis for the review of the associated SEP topics listed above. No significant physical changes since the original licensing stage have resulted to impact the original design bases and as such no further work on this topic is required.

5.0 REFERENCES

- o Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants"
- o Standard Review Plan Section 2.4.1, Hydrologic Description
- o 10 CFR, Parts 20, 50, and 100