



Northeast  
Utilities System

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May 31, 1994

Docket No. 50-213  
E14844

Re: 10CFR50.90

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

Haddam Neck Plant  
Additional Information to Support  
Proposed Revision to Technical Specifications  
Emergency Core Cooling Systems

In a letter dated November 2, 1993,<sup>(1)</sup> Connecticut Yankee Atomic Power Company (CYAPCO) submitted to the NRC Staff a proposed change to the Technical Specifications of the Haddam Neck Plant.

The proposed change would increase the allowed outage time for a charging pump from 72 hours to seven days. Seven days is judged to be sufficient to repair an inoperable charging pump and would avoid an unnecessary plant shutdown should a charging pump require extensive repairs.

Discussions between CYAPCO and the NRC Staff have been ongoing and culminated with a request that CYAPCO respond to two specific NRC questions. Information obtained from the responses would support Staff review of this proposed license amendment.

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(1) J. F. Opeka letter to the U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, Proposed Revision to Technical Specifications, Emergency Core Cooling Systems," dated November 2, 1993.

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CYAPCO hereby includes, as Attachment 1, the information requested by the Staff in a question and response format. If you have any further questions, please contact Mr. E. P. Perkins, Jr. at (203) 665-3110.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

FOR: J. F. Opeka  
Executive Vice President

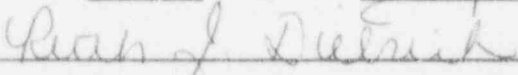
BY:   
E. A. DeBarba  
Vice President

cc: T. T. Martin, Region I Administrator  
A. B. Wang, NRC Project Manager, Haddam Neck Plant  
W. J. Raymond, Senior Resident Inspector, Haddam Neck Plant

Mr. Kevin T.A. McCarthy, Director  
Monitoring and Radiation Division  
Department of Environmental Protection  
79 Elm Street  
P.O. Box 5066  
Hartford, CT 06102-5066

Subscribed and sworn to before me

this 31st day of May, 1994



Date Commission Expires: 3/31/95

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Attachment 1

Haddam Neck Plant

Additional Information to Support  
Proposed Revision to Technical Specifications  
Emergency Core Cooling Systems

May 1994

Haddam Neck Plant  
Additional Information to Support  
Proposed Revision to Technical Specifications  
Emergency Core Cooling Systems

**Question 1:**

How did CYAPCO determine the average unavailability of the charging pump to be  $1.03E-02$ ? (See page 2 of the November 2, 1993 submittal.)

**Response 1:**

The average unavailability of the charging pump is based on 15.5 years of plant-specific data collected from 1974 to 1989. The pump unavailability is defined as the number of charging pump outage hours/the number of hours the plant is at power operation. The actual evaluation of plant-specific data and unavailability quantification is provided in Section 5.11 of Reference 1.

**Question 2:**

How did you determine the increase in core melt frequency (CMF) due to internal events to be  $3.0E-07$ /yr? (See page 3 of the November 2, 1993 submittal.)

**Response 2:**

Based on historical data, most maintenance/repair situations where the ACTION statement is entered result in using less than the full 72 hours allowed. Increasing the allowed outage time (AOT) from 72 hours to 7 days would not necessarily result in an increase in the average duration of maintenance and repair. However, to quantify the potential increase in CMF, it was assumed that the unavailability of the charging pump increased proportionally with the increase in allowable outage time or by  $7/3$  (from  $1.03E-02$  to  $2.40E-02$ ). In Reference 2, the global impact of changing the charging pump unavailability on the estimated CMF was evaluated. The charging system is modeled for both the injection and recirculation phases following a postulated loss of coolant accident (LOCA) and for reactor coolant pump (RCP) seal cooling (refer to page 2 and 3 of the November 2, 1993, submittal for system unavailability increase). When the charging pump unavailability was increased to  $2.40E-2$ , and therefore the charging system unavailability increased as indicated, the CMF due to internal events increased from  $1.800E-4$ /yr to  $1.803E-4$ /yr, or by  $3.0E-7$ /yr. The dominant

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accident sequence which contributed to this increase is as follows:

- General plant transient with loss of one emergency AC Bus (Charging Pump A and metering pump), Charging Pump B unavailable due to maintenance and loss of service water cooling (no component cooling water) — results in a consequential RCP Seal LOCA with no recirculation.

The CMF increase of  $3.0E-07$  is a theoretical maximum which is much less than one percent of the current value. It is a theoretical maximum because the value assumes that all charging pump outages increased by a factor of  $7/3$ , which is very conservative. This increase has an insignificant impact.

References:

- 1) NUSCO Calculation File C2-517-599-RE, "CY Reliability Database"
- 2) NUSCO Calculation File C2-517-1051-RE, "Connecticut Yankee Core Melt Frequency Impact of Charging Pump Allowed Outage Increase"