



Northeast
Utilities System

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(203) 665-5000

April 7, 1994

Docket No. 50-213
B14779

Re: 10CFR50.90

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

Haddam Neck Plant
Proposed Revision to Technical Specifications
Pressure Temperature Limits

Pursuant to 10CFR50.90, Connecticut Yankee Atomic Power Company (CYAPCO) hereby proposes to amend its Operating License No. DPR-61 by incorporating the attached proposed changes into the technical specifications of the Haddam Neck Plant.

Description of the Proposed Changes

The proposed changes will modify Technical Specification 3/4.4.9, "Pressure/Temperature Limits, Reactor Coolant System," Figures 3.4-3, 4, and 5 and the accompanying bases. These changes are proposed to address three issues: (1) modified heatup and cooldown curves to include the pressure drop across the core; (2) use of the narrow range pressure transmitters to monitor the Reactor Coolant System (RCS) pressure during heatup and cooldown for temperatures less than 315° F; and (3) increase the minimum vessel head tensioning temperatures from 60° F to 78° F.

Discussion

NRC Information Notice 93-58⁽¹⁾ alerted licensees of potential nonconservatisms associated with the Low Temperature Overpressurization Protection (LTOP) System resulting from the pressure drop across the core. The potential non-conservatism arose from the fact that the RCS pressure is measured in the RCS hot leg while the downcomer region of the vessel is the region which is most susceptible to non-ductile failure.

(1) U.S. Nuclear Regulatory Commission Information Notice 93-58, "Nonconservatism in Low-Temperature Overpressure Protection for Pressurized Water Reactors," dated July 26, 1993.

Ado

The information notice reiterated corrective action that was previously transmitted by Westinghouse. The corrective action involved one of the following methods to compensate for this pressure increase: 1) reduce the maximum allowable relief valve setpoint by an amount equivalent to the plant-specific calculated difference in pressure; 2) maintain RCS pressure below the heatup/cooldown curves by a value equal to the plant specific difference in pressure from both flow loss and elevation difference when the reactor coolant pumps are in operation; 3) restrict the number of reactor coolant pumps and, therefore, the flow loss error, that can be operated below a defined RCS temperature without drawing a steam bubble in the pressurizer; or 4) demonstrate that the available margin in the LTOP calculation, taking into account instrumentation uncertainty, is sufficient to offset the plant-specific pressure difference.

Upon review of this information, the Haddam Neck Plant adopted a conservative set of modified curves until the new curves proposed herein are approved by the NRC Staff.

For the Haddam Neck Plant, it was determined that there is a pressure drop of 27.24 psi when all four reactor coolant pumps are in operation. In order to ensure that the 10CFR50, Appendix G pressure/temperature limits are not exceeded at the vessel beltline region, the pressure/temperature curves, as recommended in the information notice, will be modified as shown in Attachment 2.

In addition, during the review of Information Notice 93-58 a discrepancy was identified in the instrument uncertainty margin included in the technical specifications. In the past, a margin of $+10^{\circ}$ F and -60 psi was included in the pressure/temperature limit curves to accommodate the instrument uncertainty and the difference in system static head. However, in reviewing this uncertainty it was determined that the 60 psi margin was insufficient to account for the system uncertainty whenever the wide range pressure transmitters were used to monitor the RCS pressure. Based on CYAPCO calculations, the pressure uncertainty is 15.3 psi when the pressure is obtained from the narrow range pressure transmitters and 73.2 psi for the wide range pressure transmitters. In order to minimize the required instrument margin uncertainty, the narrow range instrumentation will be used as the primary means of monitoring the RCS conditions whenever the pressure is required to be less than 600 psi. Since the LTOP valve setpoint is 380 psig and the enabling temperature is 315° F, the narrow range pressure transmitters will be used whenever the LTOP system is required to be operable. This change results in an instrument pressure shift of 42.54 psi for heatup and cooldown operation below 315° F which is less than the current margin of 60 psi included in the P/T curves. In addition, the CYAPCO calculations have determined that the previously used value of 10° F for temperature uncertainty should be changed to 16.1° F.

The final change has been prompted by the fact that ASME Section XI, Appendix G recommends that when the flange and adjacent shell region are stressed by the full intended bolt preload and by pressure not exceeding 20 percent of the preoperational system hydrostatic test pressure, the minimum metal temperature in the stressed region should be at least the initial RT_{NDT} temperature for the material in the stressed regions plus any effects of irradiation at the stressed regions. For the Haddam Neck Plant vessel, the most limiting RT_{NDT} of the flange region is the head peel segment, plate number W-9803-1, with an RT_{NDT} of 78° F. The current minimum tensioning temperature was obtained based on the most limiting flange RT_{NDT} without consideration of other regions adjacent to the flange. Therefore, the new minimum head tensioning temperature will be increased to 78° F since this is the most limiting RT_{NDT} of the peel section of the vessel head.

Safety Assessment

These changes have been evaluated against the brittle fracture requirements of 10CFR50, Appendix G and the ASME Section XI Code. The purpose of these requirements is to ensure that the desired margins of safety against non-ductile failure of the reactor vessel are maintained through all modes of operation, especially when the RCS is at low temperatures. The LTOP system and the pressure/temperature limit curves are two methods which ensure compliance with the required margins of safety.

In conclusion, the changes proposed to the technical specifications affect the heatup, cooldown, and hydrostatic test, pressure/temperature limit curves. The actions being taken by this amendment request are intended to ensure compliance with the 10CFR50, Appendix G requirements during normal modes of operation and do not impact any previously evaluated accidents. Furthermore, the proposed changes will result in more restrictive and conservative operating pressure/temperature limits, and are considered safe.

Significant Hazards Consideration

In accordance with 10CFR50.92, CYAPCO has reviewed the attached proposed changes and has concluded that they do not involve a significant hazards consideration (SHC). The basis for this conclusion is that the three criteria of 10CFR50.92(c) are not compromised. The proposed changes do not involve an SHC because the changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed modification relates to the pressure temperature limit curves. These curves are intended to preclude non-ductile failure of the reactor vessel. These proposed modifications will result in more

restrictive operating conditions than previously allowed and will not affect the probability or consequence of an accident previously evaluated. These changes have been developed based in part on a recent NRC Information Notice dealing with a pressure drop across the core. Non-conservatism arose from the fact that the RCS pressure is measured in the RCS hot leg while the downcomer region of the vessel is the region most susceptible to non-ductile failure. The revised pressure/temperature curves include additional margin which will address this issue. The changes have also resulted in the decision to use the narrow range pressure transmitters as opposed to the wide range pressure transmitters. The narrow range pressure uncertainties are less than that of the wide range pressure indicators. In order to minimize the required instrument margin uncertainty, the narrow range will now be used below 315° F. This change will result in improved accuracy in monitoring of the RCS pressure. Finally a new minimum head tensioning temperature limit was established, taking into consideration the most limiting RT_{NDT} of the peel section of the vessel head. The increase in the minimum head tensioning temperature limit will result in the most limiting RT_{NDT} being used. These changes will increase operational margin and will not increase the probability or consequence of an accident.

2. Create the possibility of a new or different kind of accident from any previously analyzed.

The proposed changes will not impact the manner of operation or the operating parameters of any system or component. These changes will only result in increased administrative and operating restrictions and will not impact plant operation in any other way. Therefore, it is concluded that the proposed changes will not create the possibility of a new or different kind of accident from any previously analyzed.

3. Involve a significant reduction in a margin of safety.

The adherence to these revised curves will ensure that the plant is maintained in a safe condition. These curves have been developed so that the reactor coolant pressure boundary is maintained with sufficient margin to ensure that, when stressed under operating, maintenance, testing and postulated accident conditions the vessel operates outside the nonbrittle fracture region. Therefore, the probability of a rapidly propagating fracture is minimized.

The changes proposed will increase the restrictions for plant operation by increasing the allowance for instrument uncertainty for operation above 315° F, include additional margin to compensate for the pressure drop across the core and increase the minimum vessel head boltup temperature. All of these changes will minimize the vessel operating loads at low temperatures when the vessel is most susceptible to

non-ductile failure. Based on this, it is concluded that the proposed changes will increase the margins of safety against non-ductile failure of the vessel.

The Commission has provided guidance concerning the application of standards in 10CFR50.92 by providing certain examples (March 6, 1986, 51 FR 7751) of amendments that are considered not likely to involve an SHC. The changes proposed herein are not enveloped by a specific example. As described above, the proposed changes do not constitute an SHC in that the changes do not involve a significant increase in the probability of occurrence or consequence of an accident previously analyzed, do not create the possibility of a new or different kind of accident, nor involve a reduction in a margin of safety.

Environmental Impact Statement

CYAPCO has reviewed the proposed license amendment against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not increase the types and amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, CYAPCO concludes that the proposed changes meet the criteria delineated in 10CFR51.22(c)9 for a categorical exclusion from the requirements for an environmental impact statement.

RT_{PTS} Review

Pursuant to 10 CFR50.61(b)(1), CYAPCO is required to submit a projected value of the RT_{PTS} for the reactor vessel beltline material with the next update of the pressure-temperature limits. The calculated RT_{PTS} for end-of-life for the Haddam Neck Plant is 156.4°F.

The Haddam Neck Plant Nuclear Review Board has reviewed and approved the proposed license amendment and has concurred with the above determination.

Attachment 1 provides a markup of proposed changes, whereas Attachment 2 provides the retyped pages of the Haddam Neck Plant's Technical Specifications. The retype of the proposed changes to technical specifications in Attachment 2 reflects the currently issued version of technical specifications. Technical specification changes previously submitted are not reflected in these changes. Therefore, the revised pages should be reviewed for continuity with the current technical specifications prior to issuance.

Regarding our proposed schedule for this amendment, we request issuance no later than December 30, 1994, with the amendment effective as of the date of issuance, to be implemented within 30 days of issuance. This timing is necessary to support the planned shutdown of the Haddam Neck Plant for refueling.

U.S. Nuclear Regulatory Commission
B14779/Page 6
April 7, 1994

In accordance with 10CFR50.91(b), we are hereby providing the State of Connecticut with a copy of this proposed amendment.

If you should have any questions regarding this submittal, please contact T. G. Cleary at (203) 665-5700.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

FOR: J. F. Opeka
Executive Vice President

BY: *E. A. DeBarba*
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. D. 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 07 day of April, 1994

Ruth J. Dietsch

Date Commission Expires: 3/31/95

Docket No. 50-213
B14779

Attachment 1

Haddam Neck Plant

Proposed Revision to Technical Specifications

Pressure Temperature Limits - Marked up Pages

April 1994