New Hampshire
Yankee

NYN-92081

June 19, 1992

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

References: (a) Facility Operating License No. NPF-86, Docket No. 50-443

(b) NHY Letter NYN-92035 dated March 20, 1992, "License Amendment Request 92-01; RTD Bypass System Elimination," T. C. Feigenbaum to NRC

Subject: Supplement 1 to License Amendment Request 92-01, RTD Bypass System Elimination

Gentlemen:

New Hampshire Yankee (NHY) submitted License Amendment Request 92-01, RTD Bypass System Elimination, to the NRC on March 20, 1992 [Reference(b)]. The NRC Staff subsequently requested additional information consisting of 17 questions; 13 from the Instrumentation and Controls System Branch and 4 from the Reactor Systems Branch. New Hampshire Yankee, NRC and Westinghouse personnel discussed NHY's responses to these requests in conference calls on June 9 and June 12, 1992. The New Hampshire Yankee responses to the NRC requests for additional information are provided herein in Enclosure 1.

During the June 12, 1992 conference call, the Reactor Systems Branch personnel stated that NHY's proposed change to Technical Specification Limiting Condition for Operation (LCO) 3.2.5 represented a line item improvement to Standard Technical Specifications and therefore could not be reviewed on an individual plant basis, however NHY could propose the change on a lead plant basis. New Hampshire Yankee had proposed to change the Reactor Coolant System flow rate requirement of LCO 3.2.5 by specifying the thermal design flow analysis value instead of the currently stated flow value which includes measurement uncertainty. This change was proposed to provide consistency in LCO 3.2.5 which currently specifies the analysis value for RCS average temperature and pressurizer pressure. The proposed change was also intended to enhance operator flexibility in the selection of the instrumentation used for RCS flow measurement.

In light of the NRC position on the proposed change to LCO 3.2.5, NHY has proposed alternative changes to LCO 3.2.5 and its BASES which specify RCS flow inclusive of measurement uncertainty. A markup of the alternative changes to LCO 3.2.5 and its BASES and a retype of the proposed changes are provided in Enclosure 2, Section II and III respectively. The proposed RCS flow rate value is 392,000 gpm (thermal design flow of

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382,800 gpm plus a flow measurement uncertainty of 2.4% flow). The basis for the 2.4% uncertainty value is discussed in the response to Reactor Systems Branch question number 2 see Enclosure 1. Additionally, NHY notes that it is hereby withdrawing the proposed clarifying changes to Technical Specification BASES page B 2-5 which were submitted with LAR 92-01. These proposed changes to page B 2-5 are being withdrawn to ensure conformance with Standard Technical Specifications.

To facilitate NRC review of Supplement 1 to License Amendment Request 92-01, NHY has enclosed as Enclosure 2 a stand alone document which is to be used in its entirety in place of the original License Amendment Request 92-01. Supplement 1 to License Amendment Request 92-01 has been reviewed and approved by the NHY Station Operation Review Committee and the Nuclear Safety Audit Review Committee. A copy of this letter and the enclosed Supplement 1 to License Amendment Request 92-01 have been submitted to the State of New Hampshire Liaison Officer pursuant to 10CFR50.91(b).

New Hampshire Yankee requests NRC review of Supplement 1 to License Amendment Request 92-01 and issuance of a license amendment by August 15, 1992. This schedule is proposed in support of NHY's plans to implement the RTD Bypass System Elimination design change during the second refueling outage which is scheduled to begin on September 7, 1992. Should you require further additional information regarding Supplement 1 to License Amendment Request 92-01, please contact Mr. Terry L. Harpster, Director of Licensing Services, at (603) 474-9521, extension 2765.

Very truly yours,

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TCF:ALL/ss/act
Enclosure

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New Hampshire Yankee
June 19, 1992

ENCLOSURE 1 TO NYN-92081

Response to NRC Instrumentation and Controls Systems Branch requests for additional information regarding NHY License Amendment Request 92-01; RTD Bypass Elimination.

NRC Question 1

Is the response time testing methodology in 2.1 (WCAP-13181) Loop Current Step Response (LCSR) testing?

NHY Response

RTDs have been tested at the manufacturer's facilities for time response. The test was a plunge test which assured compliance to procurement specifications.

The in-situ testing referred to in WCAP-13181 section 2.1 is Loop Current Step Response (LCSR) testing. This testing will assure that the RTD performance is in accordance with the safety analysis assumptions.

NRC Question 2

Seabrook does not use a median signal selector arrangement for T_{avg} and ΔT inputs to the control system. Are the requirements for control system/protection system interaction satisfied with the present input arrangement?

NHY Response

All requirements for control system/protection system interaction are satisfied with the design described in WCAP-13181. The Median Signal Selector is designed for a three loop plant to provide control signals and to meet control/protection interaction requirements. Seabrook's two out of four channel logic configuration precludes the need for a median selector.

NRC Question 3

Is the plant computer used for data collection to calculate daily heat balance or control board instrumentation?

NHY Response

The Main Plant Computer System (MPCS) is used for data collection and calculation of the daily heat balance. The heat balance calculation is performed every 30 seconds. In the event that the MPCS is unavailable main control board instrumentation is used for the heat balance data collection.

Additional information with regard to the precision calorimetric is provided in the response to questions 9 and 13.

NRC Question 4

Are there any control board modification being performed besides the removal of bypass flow alarms?

NHY Response

There are no other physical Main Control Board (MCB) modifications to be performed as a result of the RTD Bypass Elimination project. New analog inputs have been added to the plant computer for each individual RTD. These are available to the operator on computer display's on the MCB.

NRC Question 5

Will the plant use cross calibration techniques for calibration of the thermowell mounted RTDs? Is the plant intending to perform the calibration with an RTD reference installed at each calibration?

NHY Response

Cross calibration techniques for calibration of the thermowell mounted RTDs will be performed during startup after each refueling.

Westinghouse does not require the replacement of any RTDs for cross calibration. The Westinghouse position is that the drift exhibited by the multiple RTDs is random without a systematic component being noted. This position has been supported by NUREG CR 5560 "Aging of Nuclear Plant Resistance Temperature Detectors" which concludes on page 144, "Cross calibration is an effective method for verifying the consistency of a group of RTDs. This method does not account for common mode drift or any other systematic calibration problem unless one or more newly calibrated RTDs are included in the test. However, the fact that the drift of RTDs is usually random justifies the use of cross calibration as a viable method even without including reference RTDs".

NRC Question 6

Is the total response time of 6 seconds a safety analysis limit as well as the TS value?

NHY Response

The total response time used in the safety analysis is six seconds. The NHY Technical Requirements Manual lists the response time values for Overpower and Overtemperature Delta T temperature sensors as four seconds for Technical Specification surveillance testing. This agrees with the value in the Technical Specifications Bases. This four second value does not include the two additional seconds allocated in the safety analysis for electronics delay (please see Table 2.1-1 on page 13 of WCAP 13181).

NRC Question 7

Has the uncertainty for T_{avg} been revised to $\pm$ 5°F due to RTD replacement? The value for T_{avg} remain the same?

NHY Response

Revision of T_{avg} uncertainty to $\pm$ 5°F is due to incorporation of a T_c worst case streaming of an additional 1°F. The nominal value for T_{avg} at 100% power remains the same.

NRC Question 8

Table 3.1-1 (WCAP-13181) lists a rack bias of 1. What is this bias?

NHY Response

The bias is included due to cold leg streaming described in the response to question 7.

NRC Question 9

Table 3.1-2 (WCAP-13181): Is the M&TE term listed in both the RMTE and SMTE combination?

NHY Response

The M&TE term listed on Table 3.1-2 is the uncertainty of the M&TE utilized in calibration of the sensors for the applicable function, SMTE.

During the performance of the precision calorimetric, data is taken at various locations per plant procedures with attention given to the sensitivities of the calorimetric calculation, risk of spurious trips, and ease of data collection for acceptable results. The RDOT uncertainty identified in Table 3.1-2 is a combination of the uncertainties associated with the data collection for the specific fu[illegible] and adjusted according to the data collection process.

For Feedwater temperature the readings are taken locally with M&TE, therefore the RDOT term incorporates uncertainties due to temperature effects and test equipment.

For Feedwater pressure the Main Control Board meter is utilized. In this instance the RDOT term represents the calibration of the racks, RMTE, rack temperature effects, isolator accuracy, and the Main Control Board meter accuracy.

For Feedwater DP indication, two channels are read with M&TE at test points within the process racks. The RDOT represents those portions of the racks which have been calibrated, the RMTE for the M&TE utilized for the calibration and data collection, rack temperature effect, and reduced by the square root of the number of channels averaged.

For Steamline pressure three channels are read with M&TE at test points within the process racks. The RDOT represents those portions of the racks which have been calibrated, the RMTE utilized for the calibration and data collection, rack

temperature effect, and reduced by the square root of the number of channels averaged.

The T_h and T_c RDOT term includes M&TE uncertainties associated with local readings, therefore rack terms are not applicable.

Pressurizer pressure data is taken from the process racks and the RDOT term represents those portions of the racks which are utilized and the calibrated accuracy, the RMTE utilized for the calibration and data collection, and the rack temperature effect.

<u>NRC Question 10</u>

Why are no rack terms listed in Table 3.1-2 (WCAP-13181)?

<u>NHY Response</u>

The applicable portion of the rack terms are included in the RDOT term. For specific information see response to question 9.

<u>NRC Question 11</u>

Sensor drift RTDs is equal to zero in Table 3.1-2 (WCAP-13181). Is this correct?

<u>NHY Response</u>

Drift values identified in WCAP-13181 are based on an 18 month calibration cycle. The RTD cross calibration is performed on the heatup following a refueling outage. The readings for the calorimetric are typically taken after refueling during startup. No allowance for RTD drift is considered necessary over the relatively short time frame from the cross calibration to the calorimetric. See the response to question 5 for additional information on RTD drift.

<u>NRC Question 12</u>

Table 3.1-8 (WCAP-13181): Why is the overpower ΔT Cold Leg streaming bias of a different value than that shown for overtemperature ΔT.

<u>NHY Response</u>

Overtemperature ΔT cold leg streaming bias is based on a 1°F T_c streaming uncertainty. This uncertainty is affected by the K_2 value in the overtemperature ΔT equation of the Technical Specifications and converted to percent ΔT span for inclusion in the channel statistical allowance. The overpower ΔT cold leg streaming bias is based on the same 1°F T_c streaming uncertainty and is affected by the K_6 value in the overpower ΔT equation of the Technical Specifications and converted to percent ΔT span for inclusion in the channel statistical allowance. The difference in K_2 and K_6 account for the difference in the streaming bias values.

<u>NRC Question 13</u>

The DNB parameters now list RCS flow as an analytical value of 382,800 gpm. Explain what a change to an analytical value for RCS flow (DNB parameters) provides for versatility in the selection of instrumentation for measurement of

RCS flow? Reference page 4 of amendment request. Is the RCS flow value reference the thermal design limit? How will measurement uncertainties for RCS flow be accounted for in the TS/operating procedures?

NHY Response

An alternative change to Technical Specification Limiting Condition for Operation (LCO) 3.2.5 has been proposed in License Amendment Request 92-01 Supplement 1.

The RCS flow LCO in Technical Specification 3.2.5(c) has been changed from the current 391,000 gpm [thermal design flow of 382,800 gpm plus the cold leg elbow tap flow uncertainty of 2.1% flow] to 392,000 gpm [thermal design flow of 382,800 gpm plus the cold leg elbow tap flow uncertainty of 2.4% flow].

The footnote at the bottom of Page 3/4 2-10 has been revised to reflect the increase of the cold leg elbow tap flow uncertainty from 2.1% to 2.4%. The revised cold leg elbow tap flow uncertainty includes the 2.3% cold leg elbow tap flow uncertainty documented in WCAP-13181 plus an additional penalty of 0.1% specified by the Bases for Technical Specification 3/4.2.5 to account for undetected feedwater venturi fouling.

The Bases for Technical Specification 3/4.2.5 has been changed to reflect the revised cold leg elbow tap flow uncertainty.

Response to NRC Reactor Systems Branch requests for additional information regarding NHY License Amendment Request 92-01; RTD Bypass Elimination.

NRC Question 1.

Discuss how you calibrate the RTDs to determine their accuracy. What is the reference temperature and how do you account for the drift between calibrations?

NHY Response

The RCS RTDs were calibrated by the manufacturer using a reference temperature bath prior to shipment to the site. After the RTDs are installed, a cross calibration, or comparison, will be done to verify that the calibration has not changed due to installation affects. The average of the RTDs will be the reference temperature for the cross calibration. An uncertainty for drift has been incorporated into the Over Power and Over Temperature Delta T Reactor Trip Setpoint calculations.

NRC Question 2.

We require a flow measurement uncertainty value in the Technical Specifications that is based on an uncertainty analysis using plant specific instrumentation. If you use various instruments, a bounding analysis can be used. If you are using various combinations of instrumentation, then the uncertainty for each combination will be needed. It is noted that a 0.1% fouling is to be added to the flow measurement uncertainty as you have discussed in the basis.

NHY Response

An alternative change to Technical Specification Limiting Condition for Operation (LCO) 3.2.5 has been proposed in License Amendment Request 92-01 Supplement 1.

The RCS flow LCO in Technical Specification 3.2.5(c) has been changed from the current 391,000 gpm [thermal design flow of 382,800 gpm plus the cold leg elbow tap flow uncertainty of 2.1% flow] to 392,000 gpm [thermal design flow of 382,800 gpm plus the cold leg elbow tap flow uncertainty of 2.4% flow].

The footnote at the bottom of Page 3/4 2-10 has been revised to reflect the increase of the cold leg elbow tap flow uncertainty from 2.1% to 2.4%. The revised cold leg elbow tap flow uncertainty includes the 2.3% cold leg elbow tap flow uncertainty documented in WCAP-13181 plus an additional penalty of 0.1% specified by the Bases for Technical Specification 3/4.2.5 to account for undetected feedwater venturi fouling.

The Bases for Technical Specification 3/ .5 has been changed to reflect the revised cold leg elbow tap flow uncertainty.

NRC Question 3.

What method do you use to obtain the RTD response time at each refueling.

NHY Response

RTD time response was measured by the manufacturer prior to shipment to the site by the performance of a plunge test. NHY plans to measure RTD time response following installation in situ by the use of the loop current step response method. It is anticipated that the loop current step response method will be used for future in situ time response testing of the RTDs.

NRC Question 4.

Do you periodically perform surveillances to confirm that gradually failed RTDs (though unlikely) can be detected?

NHY Response

Cross calibration, or comparison, of the thermowell mounted RTDs will be performed during startup after each refueling. The Technical Specifications also require a channel check of the RCS temperature channels every 12 hours. These tests should detect the gradual failure of an RTD.