YANKEE ATOMIC ELECTRIC COMPANY

Telephone (508) 779-6711
TWX 710-380-7619

580 Main Street, Bolton, Massachusetts 01740-1398

January 5, 1990
BYR 90-004

PC 231

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

References: (a) License No. DPR-3 (Docket No. 50-29)
(b) USNRC Letter to Yankee, dated May 13, 1987

Subject: Proposed Change to Technical Specifications to Allow Utilization and Increased Testing at Power of a New Neutron Flux Instrumentation System (Proposed Change 231)

Dear Sir:

Pursuant to Section 50.90 of the Commission's Rules and Regulations, Yankee Atomic Electric Company (YAEC) hereby proposes the following amendment to Appendix A of the facility license.

Proposed Change

Reference is made to the Technical Specifications of Yankee Nuclear Power Station (YNPS), License No. DPR-3. We propose to modify the Technical Specifications as described below:

1. Technical Specification Pages 3/4 3-2, 3-4, 3-5, 3-6, and 3-8.

   Modify pages to allow the testing of the low setpoint channel trip at power, and/or to clarify Specifications.

2. Technical Specification Pages 3/4 3-3, 3-7, 3-9, 3-10, 3-12A, 3-13, 3-13A, 3-15A, and 3-16.

   Modify pages to allow the bypass and the testing of the neutron flux instrumentation trip logic at power, and/or to clarify Specifications.

3. Technical Specification Pages 3/4 3-4, 7-1, 10-3, and 10-4.

   Modify pages to take advantage of new adjustability in the upgraded system, and/or to clarify Specifications.

A001
1/1

4. Technical Specification Page 3/4 3-28.

Modify page to show new fire detector for the new instrumentation panel.

A detailed explanation of these modifications is contained in Attachment 1. The modified Technical Specification pages are contained in Attachment 2.

Description of Change

This proposed change incorporates into the Technical Specifications modifications to allow Yankee to utilize a new Neutron Flux Instrumentation System, including its ability for enhanced testing at power, and modifications to clarify Specifications.

Reason and Basis for Change

The present Neutron Flux Instrumentation System at YNPS was installed during the initial plant construction. The instrumentation's past and present performance has been excellent. However, due to advances in the capabilities of more modern systems and the difficulty to procure replacement parts, Yankee has decided to upgrade YNPS's system.

The upgraded system will be installed in the Control Room directly across from the existing system in a new panel. This panel accommodates new instrumentation drawers as well as relays, status lights, switches, and other devices needed to interface with the Reactor Protection System. Changes to the front of the Main Control Board (MCB) are minimal. The source range, intermediate range, and start-up rate meters are reused. The six power level meters and associated gain adjustment potentiometers are replaced with new digital bargraph meters and gain adjustment push buttons. New alarms are provided on the MCB in addition to those presently used to complement the new neutron flux equipment.

Utilization of the upgraded system will require an allowance for bypassing, one train at a time, the new system trip logic during quarterly testing currently required for the Main Steam Isolation Trip Logic. This is due to the interface of the trip logic circuit(s) in the upgraded system with the existing Reactor Protection System trip logic circuits via a common reactor trip circuit(s).

The NRC in Amendment Number 105 to YNPS's Technical Specifications, Reference (b), noted that:

> The current YNPS practice is to perform all elements of a nuclear instrument calibration during the monthly channel functional test, except for the calibration or test of the low trip setpoint which cannot be done at power. This current practice by the licensee is more conservative than the current monthly channel functional test required by the Technical Specifications in that, it incorporates

all elements of the functional test to verify channel operability and in addition, performs a channel calibration. Except for the low trip setpoint, the monthly test exceeds the current Technical Specification requirement to perform a quarterly channel calibration. During Inspection 50-29/87-02, the staff reviewed test procedures and test data, and verified that the channel functional test and the channel calibration as currently performed at YNPS provide assurance of channel operability that is equivalent in scope to channel functional test and calibrations specified by Westinghouse Standard Technical Specifications (STS) except for testing the low trip setpoint.

The upgraded system will allow Yankee to perform testing of its low trip setpoint during the channel functional and calibration tests. Additionally, Yankee will also be able to perform a quarterly testing of relays in the new system trip logic circuits. This enhanced testing capability will give further assurance that this vital equipment will perform its safety function.

Safety Considerations

This change is requested to allow Yankee to utilize a new Neutron Flux Instrumentation System, including its abilities for enhanced testing at power, and to clarify Specifications. As such, this proposed change would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed Specification modifications compliment and take advantage of the broader adjustment and testing capability of the upgraded Neutron Flux Instrumentation System. This will further assure that the Neutron Flux Instrumentation System will be configured conservatively, perform as designed, and support the functions assumed in the accident analysis. Therefore, these proposed Specification modifications do not involve a significant increase in the probability or consequences of an accident.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed Specification modifications do not change Specification requirements for operation or surveillance of any piping systems, electrical power systems, or mechanical structures. The proposed Specification modifications compliment and take advantage of the broader adjustment and testing capability of the upgraded Neutron Flux Instrumentation System. This will further assure that the Neutron Flux Instrumentation System will be configured conservatively, perform as designed, and support the functions assumed in the accident analysis. Therefore, the proposed Specification modifications do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Involve a significant reduction in a margin of safety. The proposed Specification modifications do not change any Specification safety

limits, except to reduce setpoints not presently reduced (LCO 3.7.1.1 Action Statement, LCO 3.10.3, and LCO 3.10.4) and provide further conservatism. Therefore, the margin of safety is not reduced.

Based on the discussion above, it is concluded that there is reasonable assurance that operation of the Yankee plant, consistent with the proposed Technical Specifications, will not endanger the health and safety of the public. This proposed change has been reviewed by the Nuclear Safety Audit and Review Committee.

Schedule

The installation of the new Neutron Flux Instrumentation System is planned to be completed during the Core XX-XXI refueling, scheduled to begin the middle of June 1990. It is requested that these proposed changes be approved prior to the refueling outage with an implementation date consistent with the Core XXI startup.

We trust that you will find this submittal satisfactory; however, should you desire additional information, please contact us.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

J. DeVincentis
Vice President

JDV/b11/0444v

cc: USNRC Region I
USNRC Resident Inspector, YNPS

Attachments

COMMONWEALTH OF MASSACHUSETTS)
)ss
MIDDLESEX COUNTY)

Then personally appeared before me, J. DeVincentis, who, being duly sworn, did state that he is a Vice President of Yankee Atomic Electric Company, that he is duly authorized to execute and file the foregoing document in the name and on the behalf of Yankee Atomic Electric Company and that the statements therein are true to the best of his knowledge and belief.

Robert H. Groce Notary Public
My Commission Expires August 29, 1991

ATTACHMENT A

Proposed Change Synopsis

SUMMARY

This proposed change incorporates into the Technical Specifications modifications to allow Yankee to utilize a new Neutron Flux Instrumentation System, including its ability for enhanced testing at power, and modifications to clarify Specifications.

DISCUSSION

The present Neutron Flux Instrumentation System at YNPS was installed during the initial plant construction. The instrumentation's past and present performance has been excellent. However, due to advances in the capabilities of more modern systems and the difficulty to procure replacement parts, Yankee has decided to upgrade YNPS's system.

The upgraded system will be installed in the Control Room directly across from the existing system in a new panel. This panel accommodates new instrumentation drawers as well as relays, status lights, switches, and other devices needed to interface with the Reactor Protection System. Changes to the front of the Main Control Board (MCB) are minimal. The source range, intermediate range, and start-up rate meters are reused. The six power level meters and associated gain adjustment potentiometers are replaced with new digital bargraph meters and gain adjustment push buttons. New alarms are provided on the MCB in addition to those presently used to complement the new neutron flux equipment.

Utilization of the upgraded system will require an allowance for bypassing, one train at a time, the new system trip logic during quarterly testing currently required for the Main Steam Isolation Trip Logic. This is due to the interface of the trip logic circuit(s) in the upgraded system with the existing Reactor Protection System trip logic circuits via a common reactor trip circuit(s).

The NRC in Amendment Number 105 to YNPS's Technical Specifications, Reference (b), noted that:

> The current YNPS practice is to perform all elements of a nuclear instrument calibration during the monthly channel functional test, except for the calibration or test of the low trip setpoint which cannot be done at power. This current practice by the licensee is more conservative than the current monthly channel functional test required by the Technical Specification in that, it incorporates all elements of the functional test to verify channel operability and in addition, performs a channel calibration. Except for the low trip

setpoint, the monthly test exceeds the current Technical Specification requirement to perform a quarterly channel calibration. During Inspection 50-29/87-02, the staff reviewed test procedures and test data, and verified that the channel functional test and the channel calibration as currently performed at YNPS provide assurance of channel operability that is equivalent in scope to channel functional test and calibrations specified by Westinghouse Standard Technical Specifications (STS) except for testing the low trip setpoint.

The upgraded system will allow Yankee to perform testing of its low trip setpoint during the channel functional and calibration tests. Additionally, Yankee will also be able to perform a quarterly testing of relays in the new system trip logic circuits. This enhanced testing capability will give further assurance that this vital equipment will perform its safety function.

CONCLUSION

This proposed change incorporates into the Technical Specifications modifications to allow Yankee to utilize a new Neutron Flux Instrumentation System including its ability for enhanced testing at power, and modifications to clarify Specifications. Based on the considerations contained herein, it is concluded that there is reasonable assurance that operation of YNPS, consistent with this proposed Technical Specification, will not endanger the health and safety of the public. Therefore, this proposed change should be approved.

Technical Specification Changes

Item	Proposed Change	Reason and Basis for Change
1) Table 3.3-1, Functional Unit 2	Modify Table 3.3-1, Functional Unit 2 and Notation (1) to locate Notation (1) with the mode in which it is applicable and to clarify that the low setpoint trips are associated only with the three Power Range channels. Refer to Pages 3/4 3-2 and 3/4 3-4 for the specific changes proposed.	The modification to Table 3.3-1, Functional Unit 2 and Notation (1) are clarifications only. Table Notation (1) applies to Mode 1 only. Its relocation in the table is made to reflect this. The high neutron flux - low setpoint trip is associated only with the Power Range Channels.
2) Table 3.3-1, Functional Units 14 and 15	Modify Table 3.3-1, Functional Units 14 and 15, Action Statements to provide an allowance for bypassing one train at a time for surveillance testing of relays in the trip logic circuits. Refer to Pages 3/4 3-3, 3/4 3-7, and 3/4 3-7A for the specific changes proposed.	Proposed Action Statement 24 clarifies the current Action Statement for Table 3.3-1, Functional Unit 14 (Action Statement 9) to provide for the bypassing of one trip logic train at a time for surveillance testing. This clarification is needed since portions of Functional Unit 14 must be bypassed during quarterly functional testing currently required for Functional Unit 15, otherwise a reactor trip would occur as a result of testing. The affected portions of Functional Unit 14 are derived from Functional Units 5, 7, 8 and 10 and exclude the nuclear instrumentation. Proposed Action Statement 25 clarifies the current Action Statement for Table 3.3-1, Functional Unit 15 (Action Statement 8) to provide for the bypassing of one trip logic train at a time for surveillance testing. This clarification is needed since Functional Unit 15 must be bypassed during its (currently) required quarterly testing to prevent a reactor trip as a result of testing. The new functional testing for Functional Unit 16 proposed for addition to Table 3.3-1 will also require the bypass of Functional Unit 14 (portions) and of Functional Unit 15.

Technical Specification Changes
(Continued)

Item	Proposed Change	Reason and Basis for Change
3) Table 3.3-1, Functional Unit 16	Modify Table 3.3-1 adding Functional Unit 16 to account for two new trains of Nuclear Instrumentation Trip Logic. Action Statement 24 is added to accompany this new functional unit and provides an allowance for bypassing one train at a time for surveillance testing. Refer to Pages 3/4 3-3 and 3/4 3-7 for the specific changes proposed.	The addition of Functional Unit 16 to Table 3.3-1 accounts for the two new trains of trip logic which are provided in a design change to replace the Nuclear Instrumentation. The applicable modes are consistent with those of Functional Units 2 and 3 which are the associated instrument channels. Proposed Action Statement 24 includes the action requirement from Action Statement 9 as well as a provision to allow bypassing of one trip logic train at a time for surveillance testing. (Action Statement 9 is the current Action Statement used for Table 3.3-1, Functional Unit 14, which is applicable to the current Nuclear Instrumentation.) This allowance is needed for the proposed quarterly Functional Testing of the Nuclear Instrumentation Trip Logic. This allowance is also needed with the implementation of the new Nuclear Instrumentation System for quarterly Functional Testing currently required for Functional Unit 15.
4) Table 3.3-1, Table Notation "#"	Modify Table 3.3-1, Table Notation "#", to change the level below which the source range detector high voltage must be energized. Refer to Page 3/4 3-4 for the specific change proposed.	The modification to Table 3.3-1, Notation "#", changes the point below which the Intermediate Range Channel must energize the Source Range Channel detector high voltage. The Source Range detector high voltage must be removed on increasing power level prior to reaching the maximum flux level specified for its operation. High voltage is automatically

Technical Specification Changes
(Continued)

Item	Proposed Change	Reason and Basis for Change
4) Table 3.3-1, Table Notation "#" (Continued)		re-energized on decreasing power level. Protection (reactor trip) functions from the Source Range Channels are not assumed in the accident analysis or used in the Reactor Protection System. The proposed notation for clarity specifies when the detector high voltage is energized rather than when it is de-energized. That is, when the Source Range Channel is functional. The setpoint has been reduced from 5×10^{-9} to 5×10^{-10} amperes. The value of 5×10^{-10} amperes will provide for at least one and one half decades of Intermediate Range Channel operation above its bottom scale value of 1×10^{-11} amperes prior to source range cutoff.
5) Table 3.3-1 Action Statement 2d	Modify Table 3.3-1, Action Statement 2d, to specify that the period of two hours allowed for coincidence operation is "per channel." Refer to Page 3/4 3-5 for the specific change proposed.	The modification of Table 3.3-1, Action Statement 2d, specifies the two-hour period of coincidence operation to be on a per-channel basis. New instruments are provided in a design change for the replacement of the Nuclear Instrumentation. The replacement instruments for the Power Range and Intermediate Power Range Channels include an automatic calibration process which requires a minimum of approximately one hour to complete and is exclusive of functional testing. The two-hour period, specified on a per-channel basis, will allow the time needed for calibration.

Technical Specification Changes
(Continued)

Item	Proposed Change	Reason and Basis for Change
6) Table 3.3-1 Action Statement 3	Modify Table 3.3-1, Action Statement 3, for clarification to remove the requirement to "place the inoperable channel in the bypassed condition within 1 hour." Refer to Page 3/4 3-5 for the specific change proposed.	The modification of Table 3.3-1, Action Statement 3, removes the requirement to "place the inoperable channel in the bypassed condition within 1 hour." The present instrumentation does not incorporate a specific feature to bypass a channel. Placing a channel in the bypassed condition serves to remove its trip function from the reactor trip logic. Although the bypass of an inoperable channel may be desirable to minimize exposure to potential spurious trips, it does not result in a more conservative protection configuration. The requirement to "place the inoperable channel in the bypassed condition within 1 hour" unnecessarily complicates the action statement. This modification is, therefore, made as a clarification.
7) Table 3.3-1 Action Statement 5	Modify Table 3.3-1, Action Statement 5, for clarification to correct an error in referencing Specification 3.1.1.1. Refer to Page 3/4 3-6 for specific change proposed.	The modification of Table 3.3-1, Action Statement 5, corrects an error. The current Action Statement makes reference to Specification 3.1.1.1, which is applicable in Modes 1 and 2. Specification 3.1.1.1.2 is the appropriate reference and is applicable in Mode 3. (Functional Unit 4b is not applicable in Modes 1 and 2.)
8) Table 3.3-1 Action Statements 6 and 7	Modify Table 3.3-1, Action Statements 6 and 7 to make the paragraph identifiers follow a consistent format. Refer to Page 3/4 3-6 for specific changes proposed.	The modification of Table 3.3-1, Action Statements 6 and 7 is a change in paragraph identification only. It is made to provide a consistent number, letter, and number format. Action Statement, Paragraphs 6.1, 6.2, 7.6.a, and 7.b.b now become 6.a, 6.b, 7.b.1, and 7.b.2.

Technical Specification Changes
(Continued)

Item	Proposed Change	Reason and Basis for Change
9) Table 4.3-1, Functional Unit 2	Modify Table 4.3-1, Functional Unit 2, to return to the specification which existed under amendments previous to Amendment 105. Refer to Pages 3/4 3-8 and 3/4 3-10 for the specific change proposed.	The modification of Table 4.3-1, Functional Unit 2, returns the specification to that which existed prior to Amendment 105. A design change for the replacement of the Nuclear Instrumentation includes provisions for calibration and testing at power of the low setpoint trip associated with each Power Range Channel. Amendment 105 was made to provide clarification since this feature was not provided for by the original design.
10) Table 4.3-1 Functional Unit 15	Modify Table 4.3-1, Functional Unit 15, to clarify that contacts or contact combinations in the logic circuit may be simulated to operate relays in the trip logic circuit. Refer to Pages 3/4 3-9 and 3/4 3-10 for the specific change proposed.	This modification is made to clarify that the testing of relays in the trip logic circuit at power requires in part that contacts or contact combinations in the logic circuit be simulated because the provision for more detailed testing (at power) is not provided in the circuit design. Testing of the manual initiation and high containment pressure functions of the logic circuit are specified to be performed at refueling intervals. (Refer to Table 4.3-2, Functional Units 3c and 3d). Note that the trip logic circuit represented by Table 4.3-1, Functional Unit 15, and Table 4.3-2, Functional Units 3b, 3c, and 3d is the same circuit.

Technical Specification Changes
(Continued)

Item	Proposed Change	Reason and Basis for Change
11) Table 4.3-1, Functional Unit 16	Modify Table 4.3-1 adding Functional Unit 16 to account for two new trains of Nuclear Instrumentation Trip Logic. Refer to Pages 3/4 3-9 and 3/4 3-10 for the specific change proposed.	The addition of Functional Unit 16 to Table 4.3-1 accounts for the two new trains of trip logic which are provided in a design change to replace the Nuclear Instrumentation. The modes listed are consistent with those of the associated instrument channels, Functional Units 2 and 3. The quarterly functional testing frequency specified is consistent with that presently specified for Functional Unit 15. The addition also specifies that contacts and contact combinations in the logic circuit may be simulated to operate relays in the trip logic circuit. This allowance will minimize the time required for the surveillance bypass of each train of trip logic. Simulation is also required for contact combinations including the permissive contacts for the start-up rate trip. The permissive contacts are normally open above 15 MWe to block the trip, and cannot be operated for testing at power.
12) Table 3.3-2 Functional Units 3b, 3c, and 3d	Modify Table 3.3-2, Functional Units 3b, 3c, and 3d, Action Statements to provide allowance for bypassing one train at a time for surveillance testing. Refer to Pages 3/4 3-12A, 3/4 3-13, and 3/4 3-13A for the specific change proposed.	Proposed Action Statement 26 clarifies the current Action Statement for these FUNCTIONAL UNITS (Action Statement 8) to provide for bypassing of one trip logic train at a time for surveillance testing. This clarification is needed since these Functional Units must be bypassed during the (currently) required quarterly testing of Functional Unit 3b to prevent tripping the Main Steam Isolation

Technical Specification Changes
(Continued)

Item	Proposed Change	Reason and Basis for Change
12) Table 3.3-2 Functional Units 3b, 3c, and 3d (Continued)		(Non-return) valves as a result of testing. Note that the trip logic circuit represented by Table 3.3-1, Functional Unit 15 and Table 3.3-2, Functional Units 3b, 3c, and 3d is the same circuit. However, Functional Unit 15 in Table 3.3-1 is applicable as a Reactor Protective System Instrumentation Functional Unit since it also provides a Reactor Trip. Action Statement 8 is deleted from Page 3/4 3-13 since it is incorporated in Action Statement 26 and is not used elsewhere in Table 3.3-2.
13) Table 4.3-2 Functional Unit 3b	Modify Table 4.3-2, Functional Unit 3b, to clarify that contacts and contact combinations in the logic circuit may be simulated to operate relays in the trip logic circuit. Refer to Pages 3/4 3-15A and 3/4 3-16 for the specific change proposed.	The description provided above in Item 10 of this table is applicable. Note that the trip logic circuit represented by Table 4.3-1 Functional Unit 15 and Table 4.3-2, Functional Units 3b, 3c, and 3d is the same circuit.
14) Table 3.3-6	Modify Table 3.3-6 to account for a fire detector installed in the new Nuclear Instrumentation panel. Refer to Page 3/4 3-28 for the specific change proposed.	The modification to Table 3.3-6 accounts for the fire detector installed in the new Nuclear Instrumentation panel associated with the design change to replace the Nuclear Instrumentation.

Technical Specification Changes
(Continued)

Item	Proposed Change	Reason and Basis for Change
15) LCO 3.7.1.1 Action Statement	Modify LCO 3.7.1.1 Action Statement to require that both the Power Range and Intermediate Power Range Channel high setpoint trips be reduced. This modification also clarifies that the Power Range and Intermediate Power Range Scram Logic be set for single channel operation except as required for surveillance. Refer to Page 3/4 7-1 for the specific change proposed.	The modification to LCO 3.7.1.1 Action Statement requires that the high setpoint trip associated with both the Power Range and Intermediate Power Range Channels be reduced and that their respective scram logic be set for single channel operation. New instruments are provided in a design change to replace the Nuclear Instrumentation. This modification takes advantage of the ability to adjust the trip setpoint over the full range in the new instruments. This provides for additional conservatism beyond the present design. The "**" notation is modified to add the Intermediate Power Range Channels and to clarify that the scram logic must be reset for coincidence operation to provide for surveillance. This must be done to prevent a reactor trip during a single channel surveillance. The two-hour allowance for coincidence operation is made on a per channel basis as done for Item 5 of this table.

Technical Specification Changes
(Continued)

Item	Proposed Change	Reason and Basis for Change
16) LCO 3.10.3, Surveillance Requirement 4.10.3.3	Modify LCO 3.10.3 to require that the high setpoint trip associated with both the three Power Range Nuclear Channels and the three Intermediate Power Range Nuclear Channels be set at ≤25% of RATED THERMAL POWER. SURVEILLANCE REQUIREMENT 4.10.3.3 is also modified to extend the present requirement to include the Intermediate Power Range Channels. Refer to Page 3/4 10-3 for the specific change proposed.	New instruments are provided in a design change to replace the Nuclear Instrumentation. The modification of LCO 3.10.3 and SURVEILLANCE REQUIREMENT 4.10.3.3 takes advantage of the ability to adjust the trip setpoint over the full range in the new instruments. This provides for additional conservatism beyond the present design. The high setpoint trip is used (rather than the low and the high) for both sets of channels for consistency.
17) LCO 3.10.4, Surveillance Requirement 4.10.4.2	Modify LCO 3.10.4 to require that the high setpoint trip associated with both the three Power Range Nuclear Channels and the three Intermediate Power Range Nuclear Channels be set at ≤25% of RATED THERMAL POWER. SURVEILLANCE REQUIREMENT 4.10.4.2 is also modified to include the Intermediate Power Range Channels. Refer to Page 3/4 10-4 for the specific change proposed.	New instruments are provided in a design change to replace the Nuclear Instrumentation. The modification of LCO 3.10.4 and SURVEILLANCE REQUIREMENT 4.10.4.2 takes advantage of the ability to adjust the trip setpoint over the full range in the new instruments. This provides for additional conservatism beyond the present design. The high setpoint trip is used (rather than the low and high) for both sets of channels for consistency.

ATTACHMENT 2

Revised Technical Specification Pages

3/4 3-2
3/4 3-3
3/4 3-4
3/4 3-5
3/4 3-6
3/4 3-7
3/4 3-8
3/4 3-9
3/4 3-10
3/4 3-12A
3/4 3-13
3/4 3-13A
3/4 3-15A
3/4 3-16
3/4 3-28
3/4 7-1
3/4 10-3
3/4 10-4