NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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September 13, 1983

Docket No. 50-423

B10876

Director of Nuclear Reactor Regulation
Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

References: (1) B. J. Youngblood to W. G. Counsil, Request for Additional Information for Millstone Nuclear Power Station, Unit No. 3 dated, May 31, 1983.

Dear Mr. Youngblood:

Millstone Nuclear Power Station, Unit No. 3
NRC Instrumentation and Control Systems Branch (ICSB)
Review Meeting - Summary of Discussion

A meeting was held with the NRC-ICSB, Westinghouse, and Stone & Webster in Boston on July 26-28, 1983 to discuss the sixty (60) Agenda items which were forwarded by Reference (1). It was agreed that a letter will be transmitted to the NRC providing a summary of discussion on each agenda item by September 15, 1983. The attached responses (Attachment I) to the agenda items simply formalize the above commitment given orally at the meeting. At the end of each attached response, the status of each item is noted as defined by one of the following three categories:

Closed - No further input or action is needed to resolve the NRC concern.

Confirmatory - The information will be provided in a formal letter or a future FSAR amendment.

Open - No resolution is possible at this time, this issue will be addressed at a later date.

Northeast Nuclear Energy Company (NNECO) will provide all additional information as committed to in confirmatory and open item responses as that information becomes available. This information will be submitted by a formal letter or by a future FSAR amendment.

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1/42

During the meeting, the NRC Staff indicated additional concerns that were not originally included in the agenda items and requested NNECO to provide a formal response to each concern. Attachment II lists these new items. A response to each new item will be provided to the NRC by December 15, 1983.

If you have any concerns related to the information contained herein or any questions related to our responses, please contact our Licensing representatives directly.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL

By NORTHEAST NUCLEAR ENERGY COMPANY, Their Agent

W. G. Counsil
Senior Vice President

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me W. G. Counsil, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, Applicants herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Applicants herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Notary Public

My Commission Expires March 31, 1988

Attachment I

Responses to Sixty (60) Agenda items discussed during July 26-28, 1983 ICSB Meeting

Attachment II

Additional NRC Concerns on Millstone 3 I&C Design

Description of Concern

Control Building Isolation Reset - Whenever an automatic isolation signal is bypassed, all other control building isolation signals are blocked.

The Transfer Switch Problem - Whenever the control for the turbine-driven auxiliary feedwater pump is transfered from the main control room to the auxiliary shutdown panel, the turbine-driven auxiliary feedwater pump starts automatically.

Letdown Line Relief Valve - The relief valve located between the inside containment isolation valve and the containment will continue to bleed to the reactor drain tank in the event the inside containment isolation valve and the letdown orefice isolation valves are failed open during containment isolation phase.

Power lock-out feature for certain Motor Operated Valves - Certain valve operators can be power locked out during plant operation from the rear of the main control board. In this mode a spurious operation at the main control board (involving an operator action) will result in the erroneous indication of the valve position.

The steam supply valve to the Turbine of the Turbine-Driven Aux. Feed Pump - Isolation of the bypass valve (bypass to the turbine steam supply valve) can not be assured as the electric power supply is not from a class IE source.

Hot & Cold Leg Temperature indication as per 1.97 - The present Millstone 3 design provides a single point hot and cold temperature measurement for each RCS loop. Further, all cold leg temperature measurements are dependent on one power source and all hot leg temperature measurements are dependent on another power source. Thus the loss of a single power source could result in the loss of all hot leg or cold leg temperature indication.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

1. (7.1) Identify any plant safety related system or portion thereof, for which the design is incomplete at this time.

Response: (7/83)

The following is a list of plant safety related systems, or portions thereof, for which the design is presently incomplete or undergoing major safety-related changes:

1. NUREG-0737, Supplement 1 (SPDS, Technical Support Center, Control Room Design Review)
2. Containment Hydrogen Monitor
3. Inadequate Core Cooling Monitor (core exit thermocouple display, reactor vessel level measuring system and saturation monitor)
4. Reactor Protection System (deletion of P-17 interlock)
5. PORV Schematics
6. Fire Protection System
7. Feedwater System (Feedwater Isolation Valve Schematics)

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

2. (7.1) As called for in Section 7.1 of the Standard Review Plan, provide information as to how your design conforms with the following TMI Action Plan Items as described in NUREG-0737:

(a) II.D.3 - Relief and safety valve position indication

(b) II.E.1.2 -Auxiliary feedwater system automatic initiation and flow indication

(c) II.E.4.2 - Containment isolation dependability (Positions 4,5, and 7)

(d) II.F.1 - Accident monitoring instrumentation (Positions 4,5, and 6)

(e) II.K.3.1 - Auto PORV isolation

(f) II.K.3.9 - PID controller

(g) II.K.3.12 - Anticipatory reactor trip

Response: (7/83)

A discussion of Millstone 3 compliance with NUREG-0737 Items II.D.3, II.E.1.2, II.E.4.2, II.F.1, II.K.3.1, II.K.3.9, and II.K.3.12 was provided in the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

3. (7.1) Provide a brief overview of the plant electrical distribution system, with emphasis on vital buses and separation divisions, as background for addressing various Chapter 7 concerns.

Response: (7/83)

The 120 V ac vital bus system is a safety related, regulated, 120 V ac, two-wire, ungrounded bus system. It supplies control and instrumentation power to the plant protection system divided into four separate channels as required by NSSS system control and logic. In addition, using FSAR Figure 8.3-3, a discussion on vital buses and separation related to the plant electrical distribution system was provided in the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

4. (7.1) Describe the cable separation inside NSSS cabinets. Section 1.8 of the FSAR implies that there is no separation between Class 1E and non-Class 1E cables. Also redundant cables routed to different compartments of a single cabinet would not be separated by the required 6 inches. Provide the analysis that demonstrates the adequacy of separation in NSSS supplied cabinets.

Response: (7/83)

A discussion of the cable separation inside NSSS cabinets was provided in the ICSB meeting. As a result of the discussion, Millstone 3 FSAR Section 7.2 will be revised to include a reference to WCAP-8892A and provide a verification that the balance of the plant control system complies with the NSSS criteria.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

5. (7.1) Describe design criteria and tests performed on the isolation devices in the balance of Plant Systems. Address results of analysis or tests performed to demonstrate proper isolation between separation groups and between safety and non-safety systems.

Response: (7/83)

The design criteria and tests performed on the isolation devices in the balance of plant systems were discussed in detail at the ICSB meeting. A test report on the isolator was provided which demonstrates that proper isolation between safety and nonsafety systems exists.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

6. (7.1) Describe features of the Millstone environmental control system which insure that instrumentation sensing and sampling lines for systems important to safety are protected from freezing during extremely cold weather. Discuss the use of environmental monitoring and alarm systems to prevent loss of, or damage to systems important to safety upon failure of the environmental control system. Discuss electrical independence of the environmental control and monitoring system circuits.

Response: (7/83)

The Millstone 3 environment control system was discussed at the ICSB meeting. The discussion included system redundance and the use of environmental monitoring and alarm systems to prevent loss of or damage to safety related systems upon failure of the environmental control system. FSAR Section 7.6 will be revised to include a description of the Millstone 3 environmental control system.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

7. (7.1) Provide a list of any non-Class 1E control signals that provide input to class 1E control circuits.

Response: (7/83)

Non-Class 1E control circuits that provide input to Class 1E control circuits were discussed with the staff during the ICSB meeting. An informational list detailing electrical schematics (ESK) references was provided to the staff.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

8. (7.1) Identify where microprocessors, multiplexers, or computer systems are used in or interface with safety related systems. Also identify any first-of-a-kind instruments used for safety related systems.

Response: (7/83)

Millstone 3 utilizes multiplexers for information processing. Portions of the radiation monitoring system are safety-related. These radiation monitors employ safety-related microprocessors. The safety-related microprocessors interface with the non-safety-related radiation monitoring computer via qualified isolators. A list of Class IE radiation monitors is provided in FSAR Section 11.5. We anticipate the hydrogen monitor and inadequate core cooling system will employ microprocessors and may possibly be considered first-of-a-kind safety-related instruments. Any safety-related instruments which interface with the plant computer are connected to it via qualified isolators. When microprocessors or computer devices are used in the safety-related systems, there will be designed and qualified in accordance with the applicable NRC guidance and regulations.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

9. (7.1) We request that the setpoint methodology for each Reactor Protection System (RPS) and Engineered Safeguards Features (ESF) trip setpoint values be provided for both NSSS and BOP scope of supply at the time the Technical Specifications are submitted for review.

Response: (7/83)

For Millstone 3, the setpoint methodology for each Reactor Protection System (RPS) and Engineered Safeguards Features (ESF) trip setpoint for NSSS scope of supply will be similar to the Virgil Summer and D.C. Cook plant. The determination of the Millstone 3 setpoints within the scope of NSSS will be consistent with the method used for the Summer plant. The setpoint methodology for BOP scope of supply is presently under review. When finalized, the setpoint methodology will be submitted to the NRC for review. This information is expected to be submitted by January 1985.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

10. (7.1) The FSAR information which discusses conformance to Regulatory Guide 1.22 is incomplete. Section 7.1.2.5 has not provided the justification for not testing at power the main feedwater isolation valves, feedwater control valves, reactor coolant pump cooling water isolation valves, and reactor coolant pump breakers. Provide the justification for not testing for these items at power. Also discuss the capability to perform 10 percent partial stroke of main steam isolation valves and main feedwater isolation valves.

Response: (7/83)

During initial submittal of the Millstone 3 FSAR, a discussion on the justification for not testing the main feedwater isolation valves, feedwater control valves, reactor coolant pump cooling water isolation valves at power was inadvertently omitted from FSAR Section 7.1.2.5. The Millstone 3 FSAR Section 7.1.2.5 will be revised to include the above justification. During the ICSB meeting the justification for not testing the reactor coolant pump breaker at power was provided to the staff. Refer to the response to Agenda Item 32 for discussion on the capability to perform 10-percent partial stroke of the main steam isolation valves and main feedwater isolation valves.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

11. (7.1) Identify any balance of plant scope safety related equipment that cannot be tested during reactor operation. Include auxiliary relays or other components in the safety related systems.

Response: (7/83)

An informational list of balance of plant scope safety related equipment that cannot be tested during reactor operation was provided to the staff during the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

12. (7.1) The FSAR Table 1.8N-1, Conformance to Regulatory Guide 1.53, you state that Failure Mode and Effect Analysis (FMEA) results from WCAP-8584 are equally applicable to actuation and actuated equipment. Provide information to demonstrate that the interface criteria in Appendix B & C of WCAP-8584 has been incorporated in BOP design.

Response: (7/83)

A response will be provided at a later date.

Status: (7/83)

This item is open.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

13. (7.1) In FSAR Table 1.8 1, Conformance to Regulatory Guide 1.62, you take exceptions to some of the regulatory positions. Besides the items discussed in Section 7.3.2.2.7, please identify any other safety related systems which are not in conformance with Regulatory Guide 1.62.

Response: (7/83)

Other than those listed in the Millstone 3 FSAR Section 7.3.2.2.7, there are no additional safety related system components that do not meet the requirement of Regulatory Guide 1.62.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

14. (7.1) The FSAR information which discusses conformance to Regulatory Guide 1.118 and IEEE 338 is insufficent. Further discussion required. As a minimum, provide the following information:

a. Discuss response time testing of BOP and NSSS protection systems using the design criteria described in Position C.12 of R.G. 1.118 and Section 6.3.4 of IEEE 338

b. Identify any temporary jumper wires or temporary test instrumentation will be used. Provide further discussion to describe how the test procedures for the protection systems conform to Regulatory Guide 1.118 Position C.14 guidelines

c. Describe typical response time test methods for pressure, and temperature sensors

Response: (7/83)

Response time testing of protection systems was discussed in the ICSB meeting, using the design criteria described in Position C.12 of Regulatory Guide 1.118 and Section 6.3.4 of IEEE 338. A copy of the specific test procedure which requires the use of temporary jumpers was provided to the staff during the meeting. Typical response time test methods were also discussed.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

15. (7.2) Discuss the rationale for using the reactor pump low speed trip and low-low speed trip to replace undervoltage trip and under frequency trip signals in the reactor trip system.

Response: (7/83)

At the ICSB meeting a discussion of the rationale for using the Reactor Coolant Pump (RCP) low speed trip to replace undervoltage trip and underfrequency trip signals was provided. It was stated that the RCP underspeed trip provides a more direct measurement of the parameters of interest, and will permit the plant to ride through many postulated voltage dip transients without reactor trip if safety limits are not violated. The underspeed trip setpoint and time response provide for the timely initiation of reactor trip during the complete loss of flow accident and the limiting frequency decay event, consistent with the analyses results reported in Chapter 15. Millstone 3 FSAR Table 7.2-2 and Figure 7.2-1 sheet 5 will be revised to reflect the deletion of P-17 interlock.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

16. (7.2) Using detailed plant design drawings, discuss the reactor trip breaker and undervoltage relay testing procedures, and the capability of independent verification of the operability of reactor trip breaker shunt and undervoltage coils.

Response: (7/83)

A discussion of the diverse features of the undervoltage and shunt trip of the reactor trip breakers (present design) and testability of both was provided in the ICSB meeting. The present Millstone 3 reactor trip breaker design does not have the design provision for the shunt trip to be independently tested. The Westinghouse Owners Group (WOG) generic solution for the modification of the Westinghouse-design reactor protection system to accommodate the addition of an automatic reactor trip via the reactor trip switchgear shunt coil trip attachment will be evaluated.

Status: (7/83)

This item is open.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

17. Identify any other safety equipment with undervoltage trip devices.

Response: (7/83)

Other than the reactor trip breaker, there is no other safety equipment with undervoltage trip devices.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

18. Discussed the rationale of the new interlock, P-17, which blocks a reactor trip on reactor coolant pump under speed in more than one loop.

Response: (7/83)

Interlock, P-17, which blocks a reactor trip on reactor coolant pump shaft low speed, will be deleted. The Millstone 3 FSAR Table 7.2-2 and Figure 7.2-1 (Sheet 5 of 19) will be revised in a future amendment to reflect the change.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

19. (7.2) (7.6) Using detailed plant design drawings, discuss the reactor coolant loop isolation design and valve interlocks.

Response: (7/83)

A discussion of the reactor coolant loop isolation design and valve interlocks was provided using P&IDs and schematics during the ICSB meeting. The option of N-1 loop operation for Millstone 3 is being evaluated. When the evaluation is completed, additional information on N-1 loop operation will be submitted to the NRC for review.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

20. (7.2) Discuss the rationale of elimating steam flow/FW flow mismatch trip logic in the reactor trip system, and using mismatch signal for alarm only.

Response: (7/83)

The elimination of the steam flow/fw flow mismatch trip logic was discussed using FSAR Figure 7.2-1, Sheet 7 at the ICSB meeting. This trip logic was deleted when steam generators low low level logic was changed from 2/3 to 2/4.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

21. (7.2) (7.3) Table 7.2-4 provides reactor trip correlation for reactor trip signal, accident analysis, and technical specifications. Please provide similar table for safety interlocks and bypasses.

Respones: (7/83)

There is no correlation between the reactor trip interlocks and the Chapter 15 Accident Analysis. The reactor trip interlock setpoints will be included in the techincal specifications in a table similar to Table 2.2-1 of NUREG-0452, Rev. 4 (STD. Tech Spec.).

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

22. (7.2) (7.3) Describe the steam generator level instrumentation. Identify the instrument channel used for protection functions and the control functions. Address the control and protection interaction conformance to Section 4.7 of IEEE Std. 279.1971.

Response: (7/83)

A discussion of the steam generator level instrumentation using a logic diagram was presented at the ICSB meeting. The steam generator instrumentation logic for possible interaction between control and protection channels was the subject of the discussion.

Status: (7/83)

This item is open.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

23. (7.2) (7.6) Using detailed schematics, describe the design of pressuizer PORV control and the block valves control, and verify that no single failure will preclude the automatic actuation logic for all modes of operation.

Response: (7/83)

The design of pressurizer PORV control and the block valves control was discussed at the ICSB meeting. The discussion focused on the possibility that a single failure could preclude the automatic actuation logic for all modes of operation including low temperature operation. The updated versions of electrical schematics for pressurizer PORV control and the block valves control will be provided to the NRC for review.

Status: (7/83)

This item is open.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

24. (7.2) The information in Section 7.2.1.1.2.6, "Reactor Trip on Turbine Trip," is insufficient. Please provide further design bases discussion on this subject, in accordance with BTP ICSB 26 requirements. As a minimum, you should:

1. Using detailed drawings, describe the routing and separation for this trip circuitry from the sensor in the turbine building to the final actuation in the reactor trip system (RTS)

2. Discuss how the routing within the nonseismic Category I turbine building is such that the effects of credible faults or failures in this area on these circuits will not challenge the reactor trip system and thus degrade the RTS performance. This should include a discussion of isolation devices

3. Describe the power supply arrangement for the reactor trip on turbine trip circuitry

4. Discuss the testing planned for the reactor trip on turbine trip circuitry

Identify other sensors or circuits used to provide input signals to the other protection systems which are located or routed through nonseismically qualified structures. This should include sensors or circuits providing input for reactor trip, emergency safeguards equipment such as the auxiliary feedwater system, and safety grade interlocks. Verification should be provided that the sensors and circuits meet IEEE-279 and are seismically and environmentally qualified. Testing or analyses performed to insure that failures of nonseismic structures, mountings, etc. will not cause failures which could interfere with the operation of any other portion of the protection system should be discussed.

Response: (7/83)

A discussion of the Reactor Trip on Turbine Trip was provided at the ICSB meeting. Included in the discussion was a description of the routing and separation for this trip circuit including the routing within the turbine building (a non-seismic structure). Also discussed were the power supply arrangement for the reactor trip on turbine trip circuity and the testing of the circuit. Layout drawings showing the routing and separation for the reactor trip on turbine trip circuitry and the turbine inpulse chamber pressure transmitter will be provided to the NRC for review.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

25. (7.2) (7.3) Identify where instrument sensors or transmitters supplying information to more than one protection channel are located in a common instrument line or connected to a common instrument tap. The intent of this item is to verify that a single failure in a common instrument line or tap (such as break or blockage) cannot defeat required protection system redundancy.

Response: (7/83)

A discussion of where instrument sensors or transmitters supplying information to more than one protection channel located in a common instrument line or connected to a common instrument tap was provided in the ICSB meeting. As a result of this discussion, the last paragraph of FSAR Section 7.2.2.3.3 will be revised to indicate that two out of four logic is used for pressurizer pressure trip. There are no shared taps for BOP sensors which input to more than one protection channel.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

26. (7.2) Discuss the method of redundantly tripping the turbine following receipt of reactor protection signals requiring turbine trip.

Response: (7/83)

A discussion of redundantly tripping the turbine following receipt of reactor protection signals requiring a turbine trip was provided in the ICSB meeting. The turbine trip logic diagram and electrical schematics were provided to the NRC staff. Also refer to the response to Agenda Item 24 for additional information.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

27. (7.3) Using detailed plant design drawings, discuss the control room isolation and pressurization system.

Response: (7/83)

A discussion of the control room isolation and pressurization system was provided using P&IDs and logic diagrams at the ICSB meeting.

Status: (7/83)

This item is closed

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

28. (7.3) Using detailed plant design drawings, discuss the containment automatic isolation system. No radiation signal was shown on the logic diagram. Please address the diversity requirements stated in Standard Review Plan Section 6.2.

Response: (7/83)

In the ICSB meeting a complete discussion of the containment automatic isolation system was presented, along with the diversity requirements of the generated signals. The containment purge supply and exhaust valves, which are normally closed during normal plant operation meet the requirements of NUREG-0737 Item E.4.2, Position 7 and BTP 6.4. These valves automatically close on a high radiation signal from containment area radiation monitors.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

29. (7.3) (7.4) Using detailed system schematics, describe the sequence for automatic initiation, operation, reset, and control of the auxiliary feedwater system. The following should be included in the discussion:

a. The effects of all switch positions on system operation

b. The effects of single power supply failures including the effect of a power supply failure on auxiliary feedwater control after automatic initiation circuits have been reset in a post accident sequence

c. Any bypasses within the system including the means by which it is insured that the bypasses are removed

d. Initiation and annunciation of any interlocks or automatic isolations that could degrade system capability

e. The safety classificaton and design criteria for any air systems required by the auxiliary feedwater system. This should include the design bases for the capacity of air reservoirs required for system operation

f. Design features provided to terminate auxiliary feedwater flow to a steam generator affected by either a steam line or feed line break

g. System features associated with shutdown from outside the control room.

Response: (7/83)

A detailed discussion of the Millstone 3 Auxiliary Feedwater System was presented using the P&IDs, logic and electrical schematic diagrams at the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

30. (7.3) (7.4) Using detailed plant design drawings, illustrate that the components in the auxiliary feedwater turbine-driven pump fluid paths are totally independent from ac power sources. Discuss the capability to control or terminate auxiliary feedwater flow under a loss of ac power event.

Response: (7/83)

As discussed at the ICSB meeting, the auxiliary feedwater turbine-driven pump fluid path was demonstrated to be totally independent from ac power sources.

FSAR Figure 6.2-47, Sheet 4 of 13, will be revised with regard to the steam supply to the turbine driven auxiliary feedwater pump.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

31. (7.3) (7.4) Discuss the water sources of the auxiliary feedwater system and the capability to transfer one source to the other. Why the condensate storage tank suction valve for the turbine-driven auxiliary feedwater pump can be operated from the main control board only, and why these valves are normally closed and fail closed in loss of control air or electric power.

Response: (7/83)

A discussion of the water sources of the auxiliary feedwater system was presented at the ICSB meeting. Control of the condensate storage tank suction valves are not provided on the auxiliary shutdown panel since the condensate storage tank suction valves are not required for cold shutdown of the plant. These normally closed valves provide isolation between safety and non-safety portions of the auxiliary feedwater system. In addition the valves fail closed on loss of control air.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

32. (7.3) Using detailed schematics and other drawings as necessary, describe the main steam and feedwater isolation valve hydraulic operators including the interfaces with the safety system electrical circuits and the periodic testing capability.

Response: (7/83)

The main steam and feedwater isolation valve hydraulic operators were described in detail at the ICSB meeting. This discussion included the capability to perform 10 percent partial stroke of the main steam isolation valves. The main feedwater valves do not have the capability to perform a partial stroke. The electrical schematics for the feedwater isolation and control valves will be provided to the NRC for review.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

33. (7.3) Using detailed schematics, describe the operation of the containment depressurization system initiating circuits, bypass, interlocks and functional testing. The FSAR states that the quench spray pumps are stopped automatically on receipt of RWST empty signal. Are they automatically restarted during the recirculation mode of operation?

Response: (7/83)

A discussion of the operation of the containment depressurization system with focus on initiating circuits, bypass, interlocks and functional testing was provided at the ICSB meeting. The quench spray pumps are not started during the recirculation mode of operation

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

34. (7.3) Discuss the redundancy of the chemical addition tank isolation valves which are closed on low addition tank level. Describe how the transmitters used to close these valves are monitored. Indicator periodic test requirements for instrumentation and controls used.

Response: (7/83)

The Agenda Item was determined to be not applicable to Millstone 3.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

35. (7.3) Using logic and schematic diagrams, describe the safety injection system initiating circuits, bypass, interlocks and functional testing.

Response: (7/83)

The safety injection system initiating circuits, bypasses, interlocks and functional testing were described in the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

36. (7.3) Using logic and schematic diagrams, describe the ac emergency power system (diesel generators and sequencer), initiating circuits, bypass, interlocks and functional testing. Provide the status of the reference report NUSCo 25212-28723, "Emergency generator load sequence control logic description 24-9.4."

Response: (7/83)

The ac emergency power system (diesel generators and sequencers) initiating circuits, bypasses, interlocks and functional testing was described using emergency generator load sequencer control logic description 24-9.4 in the ICSB meeting. The above information was provided to the NRC staff.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

37. (7.3) Using detailed drawings, describe the ventilation systems used to support engineered safety features areas including areas containing systems required for safe shutdown. Discuss the design bases for these systems including redundancy, testability, etc.

Response: (7/83)

A discussion of the ventilation systems used to support engineered safety features areas including areas containing systems required for safe shutdown was provided in the ICSB meeting. The discussion focused on the design bases for these systems including redundancy and testability.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

38. (7.3) Using detailed electrical schematics and piping diagrams, discuss the automatic and manual operation and control of the the station service water system and the component cooling water system. Discuss the interlocks, automatic switchover, testability, single failure, channel independence, indication of operability, and the isolation functions.

Response: (7/83)

A discussion of the automatic and manual operation and control of the station service water and the component cooling water systems was provided in the ICSB meeting. This discussion covered the interlocks, automatic functions, testability, single failure, channel independence, indication of operability, and the isolation functions of each system.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

39. (7.3) Identify any pneumatically operated valves in the ESF system. Using detailed schematics, describe their operation on loss of instrument air system.

Response: (7/83)

A discussion of ESF system pneumatically operated valves, including their operation on loss of instrument air system, was presented in the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

40. (7.3) Use detailed plant design drawings/procedures to describe how redundancy in electrical power supply and control is obtained when the spare component water pump is used.

Response: (7/83)

The third or spare reactor plant component cooling water pump may be connected to either Class 1E bus 34C or 34D. The interlocks that preclude two reactor plant component cooling water pumps from being powered from the same Class 1E bus, and preclude redundant buses from being tied together were described using an electrical schematic in the ICSB meeting. The discussion included reference to the response to the NRC Question 430.31.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

41. Discuss the testing provision in the engineered safety feature (7.3) P-4 interlocks.

Response: (7/83)

A discussion of the testing provisions in the engineered safety feature P-4 interlocks was provided at the ICSB meeting. The discussion included implementing the Westinghouse recommendation into the test procedure. Specific testing provisions will be submitted to the NRC for review when finalized.

Status: (7/83)

This item is open.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

42. (7.3) Several safety system channels make use of lead, lag, or signal compensation to provide signal time response consistent with assumptions in the Chapter 15 analyses. The time constants for these signal compensations are adjustable setpoints within the analog portion of the safety system. The staff position is that the time constant setpoint be incorporated into the plant technical specifications. Provide a discussion on this matter.

Response: (7/83)

The lead, lags, or signal compensation used in the Chapter 15 analyses that will be included in the Millstone 3 Technical Specifications are listed below:

Overtemperature ΔT: (reactor trip)	T_{avg} compensation lead 33 sec. lag 4 sec.
Overpower ΔT: (reactor trip)	T_{avg} compensation rate-lag 10 sec.
Low Steamline Pressure: (SI)	Lead 50 sec. Lag 5 sec.
High Steamline Pressure Rate: (SI)	Rate-lag 50 sec.

These are the only lead lags used in the Chapter 15 analysis.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

43. (7.3) On May 21, 1981, Westinghouse notified the Commission of a potentially adverse control and protection system interaction whereby a single random failure in the volume control tank (VCT) level control system could lead to a loss of redundancy in the safety injection system for certain Westinghouse plants. Discuss the VCT level control system in Millstone design.

Response: (7/83)

An evaluation of a single random failure in the Millstone 3 volume control tank (VCT) level control system was provided to the NRC staff in the ICSB meeting. It was stated that Westinghouse recommendation for procedural changes will be incorporated in the operating procedure.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

44. (7.3) Discuss the fault tree analysis (FTA) technique and the interface with WCAP-8584, "Failure Mode and Effects Analysis of the Engineered Safety Features Actuation System."

Response: (7/83)

A discussion of the fault tree analysis (FTA) and the interface with WCAP-8584, "Failure Mode and Effects Analysis of the Engineered Safety Features Actuation System" was presented in the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

45. (7.4) Verify whether the systems required for safe shutdown can be periodically tested during normal operation. Provide a cross reference to the Technical Specificaton section for those components that will be tested during normal operation.

Response: (7/83)

The components required for safe shutdown which cannot be periodically tested during normal operation were identified at the ICSB meeting. (Refer to FSAR Section 7.1.2.5.) The technical specification for surveillance requirements of the RPS components will be the same as the standard technical specifications. The technical specification for surveillance requirements for other components required for safe shutdown is being reviewed, and the results of this review will be submitted to the NRC for review.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

46. (7.4) Use plant design drawings to discuss the main steam atmospheric relief valves control scheme. Is this a safety grade system?

Response: (7/83)

A discussion of the control scheme for the main steam atmospheric relief valves was presented in the ICSB meeting. It was indicated that the modulating control signal is not safety grade.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

47. (7.4) FSAR Section 7.4.1.5 states, "Loss of instrument air does not prevent the operation of the minimum systems necessary for hot standby or cold shutdown." Provide further discussion for valves operation in auxiliary feedwater system, steam generator PORV, RHR system, and other pneumatic operators used in the safe shutdown systems.

Response: (7/83)

A discussion of pneumatically operated valves in the auxiliary feedwater system, steam generator PORV, RHR system, and other pneumatically-operated valves in the safe shutdown system including their operation on loss of instrument air was presented at the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

48. (7.4) The information supplied for remote shutdown from outside the control room is insufficient. Therefore, provide further discussion to describe the capability of achieving hot and cold shutdown from outside the control room. As a minimum, provide the following information:

a. Location of transfer switches and remote control station include layout drawings, etc

b. Design criteria for the remote control station equipment including transfer switches

c. Description of distinct control features to both restrict and to assure access, when necessary, to the displays and controls located outside the control room

d. Discuss the testing to be performed during plant operation to verify the capability of maintaining the plant in a safe shutdown condition from outside the control room

e. Description of isolation, separation and transfer/override provisions. This should include the design basis for preventing electrical interaction between the control room and remote shutdown equipment

f. Description of any communication systems required to coordinate operator actions, inlcuding redundancy and separation

g. Description of control room annunciation of remote control or overridden status of devices under local control

h. Means for ensuring that cold shutdown can be accomplished

i. Discuss the separation arrangement between safety related and nonsafety related instrumentation on the auxiliary shutdown panel

Response: (7/83)

A detailed discussion of remote shutdown from outside the control room was provided at the ICSB meeting. Revised ESKs will be submitted to the NRC.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

49. (7.4) The nonseismic portion component cooling water heat exchangers are automatically isolated from service water system on a loss of offsite power, or a containment depressurization signal. The staff is concerned that if there is an earthquake without an accident, the nonseismic structure can be assumed to fail, and the nonseismic portion of the service water system may not receive an automatic signal to isolate as required. Provide an evaluation to resolve this concern.

Response: (7/83)

A low pressure signal automatically actuates a motor-operated valve(s) to isolate each service water train from the turbine plant component cooling water heat exchangers. These heat exchangers are also isolated on a LOP or CDA signal. The pressure switches and MOVs are nuclear safety related, Seismic Category I, and are powered from a Class IE bus. Therefore, turbine plant component cooling water heat exchangers can be isolated in the event of an earthquake.

FSAR Section 7.3.2.3.7 "Service Water System" will be revised to indicate these valves close automatically on LOP, CDA, and low header pressure.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

50. (7.4) Use detailed schematic to describe the control circuits of the pressurizer pressure control (PORV and heater control), including the interlock and bypass provision from the auxiliary control panel.

Response: (7/83)

A description of the control circuits of the pressurizer heater control including the interlock and bypass provision from the auxiliary control panel was provided in the ICSB meeting. Refer to the response to Agenda Item 23 for the description of the control circuit of the pressurizer PORV. The specific procedure for feed and bleed will be covered in the emergency procedures guidelines which will be submitted to the NRC for review.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

51. (7.4) Discuss the plant tests to verify the capability of maintaining the plant in a safe shutdown condition from outside the control room. Describe design compliance with Regulatory Guide 1.68.2.

Response: (7/83)

A discussion of plant tests to verify the capability of maintaining the plant in a safe shutdown condition from outside the control room was presented in the ICSB meeting. The discussion included a reference to the test summary in FSAR Table 14.2-2, Item 25.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

52. (7.5) Using detailed plant design drawings (schematics), discuss the Millstone design pertaining to bypassed and inoperable status indication. As a minimum, provide the information to describe:

1) Compliance with the recommendations of Regulatory Guide 1.47

2) The design philosophy used in the selection of equipment/systems to be monitored

3) How the design of the bypass and inoperable status indication systems comply with positions B1 through B6 of ICSB Branch Technical Position No. 21

4) The list of system automatic and manual bypasses within the BOP and NSSS scope of supply as it pertains to the recommendations of Regulatory Guide 1.47

The design philosophy should describe as a minimum the criteria to be employed in the display of inter-relationships and dependencies on equipment/systems and should insure that bypassing or deliberately induced inoperability of any auxiliary or support system will automatically indicate all safety systems affected.

Response: (7/83)

A detailed discussion of the bypass and inoperable status indication design was presented using schematics at the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

53. (7.5) Discuss your plant computer system which is used for the backup of the safety related display instrumentation.

Response: (7/83)

A discussion of the Millstone 3 plant computer system was presented at the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

54. (7.5) Use schematic and layout drawings to discuss the physical separation and wiring for redundant safety related instruments on the main control board.

Response: (7/83)

A description of the physical separation and wiring for redundant safety related instuments on the main control board was provided using schematics and layout drawing at the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

55. (7.6) Provide a discussion (using detailed drawings) on residual heat removal (RHR) system as it pertains to Branch Technical Positions ICSB 3 and RSB 5-1 requirements. Specifically, address the following as a minimum:

(a) Testing of the RHR isolation valves as required by branch Position E. of BTP RSB 5-1

(b) Capability of operating the RHR from the control room with either onsite or only offsite power available as required by Position A.3 of BTP RSB 5-1. This should include a discussion of how the RHR system can perform its function assuming a single failure.

(c) Describe any operator action required outside the control room after a single failure has occurred and justify

In addition, identify all other points of interface between the Reactor Coolant System (RCS) and other systems whose design pressure is less than that of the RCS. For each such interface, discuss the degree of conformance to the requirements of Branch Technical Position ICSB No. 3. Also discuss how the associated interlock circuitry conforms to the requirements of IEEE Standard 279. The discussion should include illustrations from applicable drawings.

Response: (7/83)

A discussion of the Residual Heat Removal (RHS) System, including isolation valve testing and operator actions following a single failure, was provided in the ICSB meeting.

The NRC staff disagreed with NU's position that BTP ICSB No. 3 is applicable only to the design of the RHS system. An identification of the interface points between RCS and other systems whose design pressure is less than that of the RCS and the isolation valve arrangement at these interface points was requested by the NRC.

Status: (7/83)

This item is open.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

56. (7.6) Using detailed system schematics, describe the power distribution for the accumulator valves and associated interlocks and controls including bypass indicator light arrangement. Describe how power is removed and how the system complies to Positions B.2, B.3, and B.4 of BTP ICSB 18 (PSB). Also, identify any other such areas of design and state your conformance to the positions of BTP ICSB 18.

Response: (7/83)

A description of the power distribution for the accumulator valves and associated interlocks and controls including the bypass indicator light arrangement was provided at the ICSB meeting.

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

57. (7.6) FSAR Section 7.6.13 has repeated information from Section 7.6.8. Please correct this error.

Response: (7/83)

Millstone 3 FSAR Section 7.6 was revised to correct the above error. (See Amendment 2 to FSAR dated April 1983.)

Status: (7/83)

This item is closed.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

58. (7.6) Discuss interlocks for RCS pressure control during low temperature operation.

Response: (7/83)

Refer to the response to Agenda Item 23.

Status: (7/83)

This item is open.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

59. (7.6) Discuss containment leakage monitoring system and fuel pool cooling and purification system. You only address to IEEE Std. 279 Paragraph 4.2, 4.9, and 4.13. Discuss other requirements in IEEE Std. 279; such as testability, manual initiation, etc.

Response: (7/83)

A discussion of the containment leakage monitoring system and fuel pool cooling and purification system was presented in the ICSB meeting. As a result of this discussion, FSAR Sections 7.6.6 and 7.6.7 will be revised to address the applicable requirements of IEEE 279-1971.

The discussion included a reference to the response to NRC Question 410.21.

Status: (7/83)

This item is confirmatory.

AGENDA ITEMS

INSTRUMENTATION AND CONTROL SYSTEMS BRANCH

60. (7.6) Describe the automatic and manual design features permitting switchover from the injection to the recirculation mode of emergency core cooling, including protection logic, component bypasses and overrides, parameter monitored and controlled, and test capabilities.

Response: (7/83)

A step-by-step description of the automatic and manual design features permitting switchover from the injection to the recirculation mode of emergency core cooling was discussed using P&IDs, logic and electrical schematics at the ICSB meeting. The discussion included the protection logic, component bypasses and overrides, parameters monitored and test capabilities for ECSS components.

Status: (7/83)

This item is closed.