

NORTHEAST UTILITIES



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

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 665-5000

August 7, 1985

Docket Nos. 50-245
50-336
B11637

Mr. Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Gentlemen:

Millstone Nuclear Power Station, Unit Nos. 1 and 2
Additional Information Regarding Appendix R
Exemption Requests

In accordance with the NRC Staff verbal requests of June 27, 1985, Northeast Nuclear Energy Company (NNECO) is providing the attached additional information regarding the Millstone Unit Nos. 1 and 2 Appendix R exemption requests. Additional information was requested for the following questions:

1. Your previous submittal⁽¹⁾ did not specify what protection will be used to eliminate the susceptibility to hot shorts for the Unit 1 main steam isolation valve (MSIV) control circuits during a control room fire. Please specify.
2. Your previous submittal⁽²⁾ did not specify what protection will be used to eliminate the susceptibility to hot shorts for the Unit 2 pressurizer and reactor head vent control circuits during a control room fire. Please specify.
3. Your previous submittal⁽¹⁾ did not specify what disconnect device will be installed in the Unit 1 Automatic Depressurization System (ADS) valve control circuitry to assure the valves remain closed during a control room fire. Please specify and provide a control wire diagram.

(1) W. G. Council letter to D. G. Eisenhower, dated December 4, 1984, Subject: Millstone Nuclear Power Station, Unit No. 1, Information Supporting 10CFR50 Appendix R Reviews.

(2) W. G. Council letter to D. G. Eisenhower, dated January 31, 1985, Subject: Millstone Nuclear Power Station, Unit No. 2, Information Supporting 10CFR50 Appendix R Review.

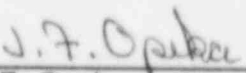
1006
1/1

4. Your previous submittal⁽¹⁾ did not specify what disconnect device will be installed in the Unit 1 AC breaker cubicles to ensure local operation of the hot shutdown breakers during a control room fire. Please specify and provide a control wire diagram.
5. What changes have you made from previous submittals^(1,2) regarding the safe shutdown capability for Units 1 and 2?

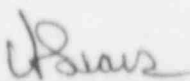
This additional information should resolve the items discussed above and result in the issuance of a favorable SER from the Auxiliary Systems Branch. To the extent the NRC Staff proposes to take action denying the control room or any of the remaining unresolved exemption requests, NNECO reaffirms its previous request^(3,4) for an appeal meeting with appropriate NRC management prior to issuance of the final fire protection SER for Millstone Unit Nos. 1 and 2.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



J. F. Opeka
Senior Vice President



By: C. F. Sears
Vice President

Attachment

cc: R. H. Vollmer
W. V. Johnston

-
- (3) W. G. Counsil letter to D. G. Eisenhower, dated April 15, 1983, Subject: Millstone Nuclear Power Station, Unit Nos. 1 and 2, Information Supporting 10CFR50 Appendix R Review.
 - (4) W. G. Counsil letter to D. G. Eisenhower, dated April 15, 1983, Subject: Millstone Nuclear Power Station, Unit Nos. 1 and 2, Control Room Fire Review Supporting Exemptions from 10CFR50, Appendix R.

Docket Nos. 50-245
50-336

Attachment

Millstone Nuclear Power Station
Unit Nos. 1 and 2

Additional Information Regarding Appendix R
Exemption Requests

August, 1985

Millstone Nuclear Power Station, Unit Nos. 1 and 2

Additional Information Regarding Appendix R Exemption Requests

NNECO's additional information is provided in response to the questions received informally by the NRC Staff on June 27, 1985.

Question

1. Reference (1) did not specify what protection will be used to eliminate the susceptibility to hot shorts for the Unit 1 MSIV control circuits during a control room fire. Please specify.

Response

This proposed modification will not enter the detailed design stage until NRC approval is received for the Appendix R control room exemption request. At this time we are able to provide the following information.

A measure of protection shall be used to insure the switchboard wire associated with the MSIV solenoid valves shall not be susceptible to hot shorts. This may be done by any of the following modifications:

- 1) Special fire rated wire.
- 2) Existing wire protected from hot shorts by running individual conductor in conduit.
- 3) Fire rated wrapping material.
- 4) Mineral insulated cable/wire.

Question

2. Reference (2) did not specify what protection will be used to eliminate the susceptibility to hot shorts for the Unit 2 pressurizer and reactor head vent control circuits during a control room fire. Please specify.

Response

This proposed modification will not enter the detailed design stage until NRC approval is received for the Appendix R control room exemption request. At this time we are able to provide the following information.

The pressurizer and head vent control circuits will be modified to protect against hot shorts from control room fires. The modification as detailed in Sketch Q1-1 shall consist of removing the fuses to the pressurizer and head vent control circuits during plant operation. The indication portion of the circuit shall be separately fused such that valve indication will not be lost when the fuses associated with the solenoid valves are removed. The second measure of protection shall be to insure the switchboard wire associated with the solenoid valves shall not be susceptible to hot shorts. This may be done by any of the following modifications:

- 1) Special fire rated wire.
- 2) Existing wire protected from hot shorts by running individual conductor in conduit.

- 3) Fire rated wrapping material.
- 4) Mineral insulated cable/wire.

Question 3

3. Reference (1) did not specify what disconnect device will be installed in the Unit 1 ADS valve control circuitry to assure the valves remain closed during a control room fire. Please specify and provide a control wire diagram.

Response

This proposed modification will not enter the detailed design stage until NRC approval is received for the Appendix R control room exemption request. At this time we are able to provide the following information.

The proposed manual disconnection device (e.g. a knife switch) depicted on Sketch Q2-1 will assure the control room operator that the ADS valves remain closed for a postulated control room fire in Zone A which disables main control board panel 903. The manual disconnect devices will be located in auxiliary control board panel 932 in Zone D. A description of operator actions required for a fire in auxiliary control board panel 932 is described in Table 1 of Reference (1).

Question 4

4. Reference (1) did not specify what disconnect device will be installed in the Unit 1 AC breaker cubicles to ensure local operation of the hot shutdown breakers during a control room fire. Please specify and provide a control wire diagram.

Response

This proposed modification has been eliminated. Modifications required for a Turbine Building Fire will allow for emergency operation of the CRD pump. This will allow the control room operator to take actions outside the control room as well as the turbine building (see Response to Question 5).

Question

5. What changes have you made from References (1) and (2) regarding the safe shutdown capability for Units 1 and 2?

Response

There have been no changes made for Unit 2 regarding safe shutdown capability from the information supplied in Reference (2). For Unit 1 NNECO is now taking credit for the shutdown cooling system to achieve cold shutdown. Damage repair procedures will be used to protect and repair the required cold shutdown equipment and cabling.

The following is a summary description of the Appendix R safe shutdown process at Millstone Unit No. 1. Plant modifications will be made and operating procedures revised to ensure that the actions described can be carried out. For cases where repairs to cold shutdown equipment are required, repair procedures will be prepared and repair material procured and stored on-site.

I. Appendix R Safe Shutdown Concept

Millstone Unit No. 1 safe shutdown concepts were developed with the following goals:

1. To minimize the number of systems and operator actions required to bring the plant to safe shutdown for a fire in any given fire area.
2. To minimize the number of different shutdown methods required by combining fire area safe shutdown actions to the greatest degree possible.
3. To minimize the extent of repairs required for cold shutdown.

Application of the above goals led us to identify three basic fire areas for post-fire shutdown. The method to be used will depend on the location of the fire. The three fire areas considered for safe shutdown purposes are:

1. Control Room
2. Turbine Building/Intake Structure
3. Reactor Building

II. Control Room Fires

The shutdown method to be used for a control room fire was described in Reference (1). There has been no change in our position for safe shutdown following a control room fire.

III. Turbine Building/Intake Structure Fires

A serious fire in the turbine building could result in damage to numerous control and power cables. For this scenario, NNECO conservatively assumed that all cooling water systems would be lost and that a station blackout situation exists.

Corrective action would consist of scrambling the reactor and initiating isolation condenser operation. In order to actuate the isolation condenser, an operator will be dispatched to the reactor building to manually open motor operated valve 1-IC-3 once the decision has been made. Walkdowns indicate that this action can be accomplished in less than six minutes. Makeup to the shell side of the isolation condenser will be supplied in the normal manner from the fire water system, which does not depend on normal or emergency station power.

After a decay heat removal path has been established via the isolation condenser, the operators will initiate manual actions to align Millstone Unit No. 2 emergency power to a Unit 1 CRD pump. The proposed modifications required to accomplish this were described in Reference (1). The CRD pump will be used to compensate for any decrease in reactor vessel water level due to

leakage and shrinkage during cooldown. Our calculations indicate that if the isolation condenser is actuated within six minutes following a scram, and technical specification leakage of 25 gpm is conservatively assumed, makeup from the CRD pump is not required for at least six hours if the RCS remains pressurized. If the RCS is depressurized and nominal RCS leakage is assumed, it is estimated the CRD pump is required within 1 hour following a scram to account for decreased reactor vessel water level due to shrinkage during cooldown. The CRD pump(s) will be modified so that they will operate without an external source of cooling water.

After the fire has been extinguished and the CRD pump realigned for primary makeup, steps will be taken to cool the plant to cold shutdown. Fire water will be supplied to the shutdown cooling pump motors and the secondary side of the shutdown cooling heat exchangers for cooling. Power for the shutdown cooling pump and the shutdown cooling isolation valve inside the drywell (I-SD-1) will be supplied from a Millstone Unit No. 2 emergency bus. Plant modifications and procedures will be prepared and repair materials provided to ensure that the plant can be put into cold shutdown within 72 hours of a turbine building/intake structure fire.

IV. Reactor Building Fires

For purposes of safe shutdown after a reactor building fire, the reactor building has been divided into two zones:

1. The shutdown cooling pump cubicle; and
2. The balance of the reactor building.

Fires in the drywell are not possible since the drywell is inerted with nitrogen as required by Technical Specifications.

A fire in the shutdown cooling pump cubicle leaves other plant equipment unaffected. Hot shutdown will be achieved using existing equipment and station procedures for loss of off-site power. The plant will be brought to a cold shutdown condition by circulating reactor coolant to the torus via the ADS valves and then reinjecting torus water into the reactor vessel via the LPCI pumps and heat exchangers.

For a fire in the balance of the reactor building, decay heat removal will initially be via discharge of steam to the torus through the safety/relief valves. Reactor vessel makeup will be provided via the FWCI system. After the fire has been extinguished, steps will be undertaken to restore isolation condenser operability. The isolation valves outside the drywell will be manually opened. The isolation valves inside the drywell will require repairs to their power cables at the drywell penetrations to allow them to be opened. The cable penetrations will be protected with fire wrap to allow these repairs to be accomplished.

To achieve cold shutdown, the shutdown cooling system will be utilized. Fire water will be used to cool the pump motors and the shutdown cooling heat exchangers, in the same way as for a turbine building/intake structure fire.

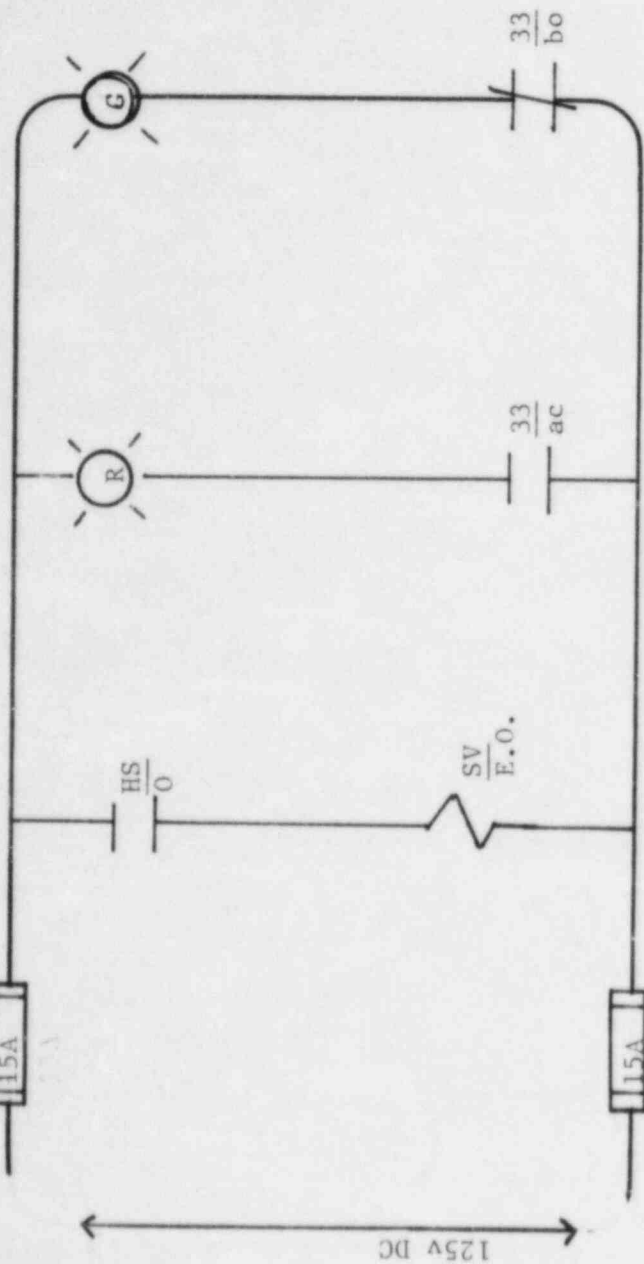
The shutdown cooling system isolation valves outside the drywell will be manually opened. The shutdown cooling valve inside containment will require

repairs to its power cable to allow it to open. The cable for this valve will be protected at the penetration with fire wrap to allow this repair to be accomplished. Repairs will also be required for the power cable to the shutdown cooling pump motors. Plant modifications and procedures will be provided and the necessary repair materials stored on-site to allow repairs to be made and the plant to be brought to cold shutdown within 72 hours of a reactor building fire.

-
- References: (1) W. G. Council letter to D. G. Eisenhower, dated December 4, 1984, Subject: Millstone Nuclear Power Station, Unit No. 1, Information Supporting 10CFR 50 Appendix R Review.
- (2) W. G. Council letter to D. G. Eisenhower, dated January 31, 1985, Subject: Millstone Nuclear Power Station, Unit No. 2, Information Supporting 10CFR 50 Appendix R Review.

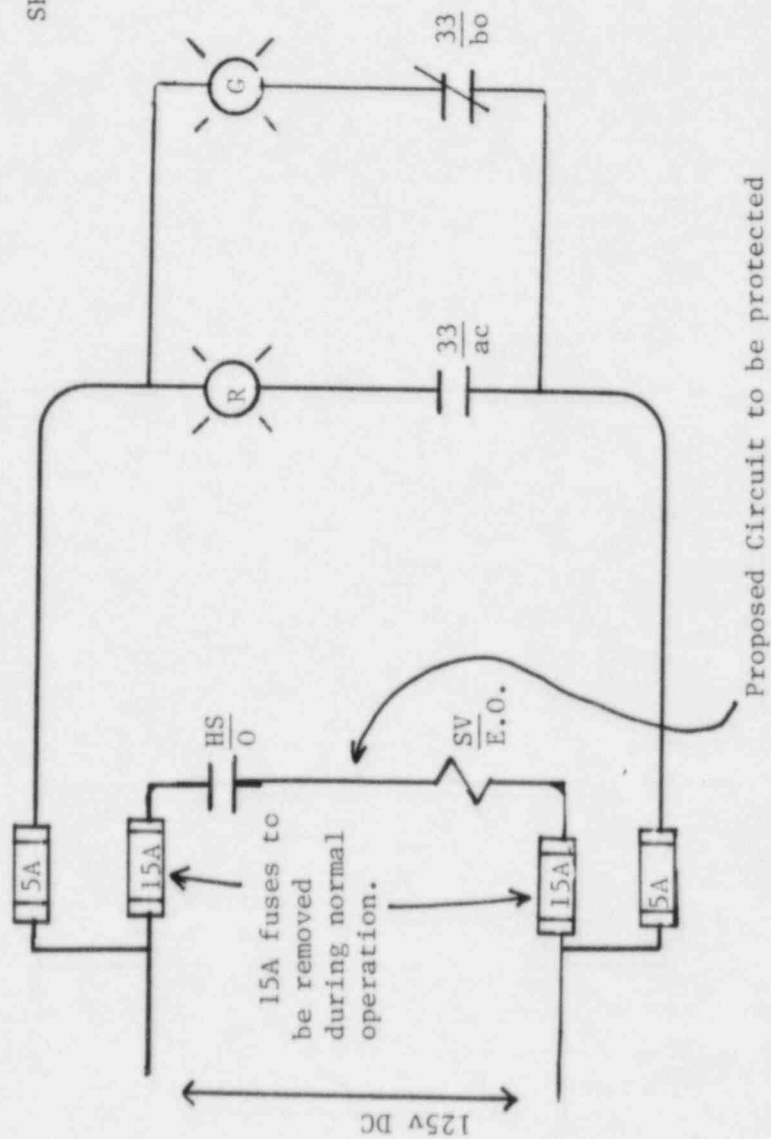
PROPOSED MODIFICATION #7 (MP-2) PRESSURIZER & HEAD VENT CIRCUITS

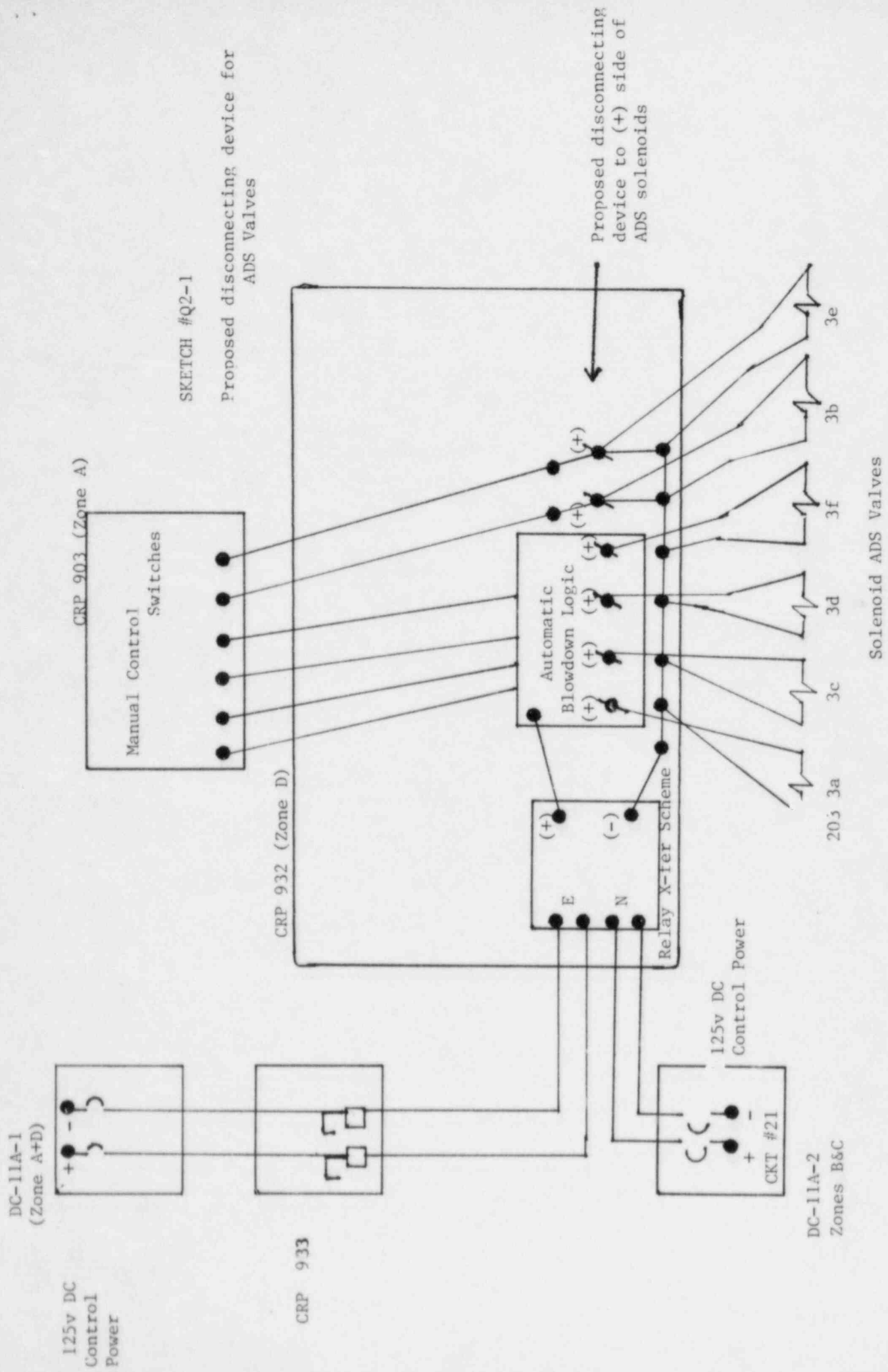
Existing Circuit



SKETCH # Q1-1

Modified Circuit





SKETCH #Q2-1

Proposed disconnecting device for
ADS Valves

Solenoid ADS Valves