Consumers Power Company

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COPY

May 19, 1981

Director, Nuclear Reactor Regulation
Att Mr Dennis M Crutchfield, Chief
Operating Reactors Branch No 5
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-155 - LICENSE DPR-6 -
BIG ROCK POINT PLANT - FIRE
PROTECTION MODIFICATIONS

NRC Generic Letter 81-12, dated February 20, 1981 requested information pertaining to proposed modifications for compliance with the Fire Protection Rule (45 FR 76602, November 19, 1980).

Consumers Power Company letter dated March 19, 1981 provided plans for achieving compliance with those requirements including a design description. The design of the Big Rock Point Plant which utilizes an emergency condenser for plant shutdown in the event of loss of AC power provides an uncomplicated solution for providing the required alternate shutdown capability. The previously submitted design description provides the specifics of how the emergency condenser and alternate shutdown capability interface. Attachments 1 and 2 provided herein respond to the detailed information requests of Enclosures 1 and 2 to Generic Letter 81-12.

Gregory C Withrow (Signed)

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CC Director, Region III, USNRC
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Attachments - 8 pages

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Attachment 1

Big Rock Point Plant Fire Protection Modifications

Response to Enclosure 1, Paragraph 8, Information Requirements of Generic Letter 81-12 dated February 20, 1981

8. (a) Description of the systems or portions thereof used to provide the shutdown capability and modifications required to achieve the alternate shutdown capability if required.

Response: The description of the modifications for the assurance of safe shutdown - required by 10CFR50, Paragraph 50.48 - was submitted by Consumers Power Company letter dated March 19, 1981. Subsequent to the submittal of thi description, a change in the planned modification has been made which affects the normal power supply to Control Rod Drive (CRD) Pump #1. This pump will be supplied from its present source via a feeder cable routed through the equipment lock. On the outside of containment and the lock at or near the electrical penetration, a dual, interlocked, nonautomatic circuit breaker will be installed. The breaker will switch the motor to either its normal source or an alternate source. Attached Figure #1 illustrates this concept. See also response to 8(1).

8. (b) System design by drawings which show normal and alternate shutdown control and power circuits, location of components, and that wiring which is in the area and the wiring which is out of the area that required the alternate system.

Response: The information provided by 8(a) above and in our letter dated March 19, 1981 describe the modification design and by either description or illustration provide the requested information.

8. (c) Demonstrate that changes to safety systems will not degrade safety systems. (eg., new isolation switches and control switches should meet design criteria and standards in FSAR for electrical equipment inthe system that the switch is to be installed; cabinets that the switches are to be mounted in should also meet the same criteria (FSAR) as other safety related cabinets and panels; to avoid inadvertent isolation from the control room, the isolation switches should be keylocked, or alarmed in the control room if in the "local" or "isolated" position; periodic checks should be made to verify switch is in the proper position for normal operations; and a single transfer switch or other new device should not be a source for a single failure to cause loss of redundant safety systems).

Response:

1 Equipment and equipment housings procured for and utilized in the modifications for the assurance of the ability to take the plant to safe shutdown have been specified to be qualified for earthquakes in accordance with IEEE 344-1975 and IEEE 323-1974 when placed within or interfacing with safety systems.

2 Switches which transfer control or instrument functions from the control room to the auxiliary shutdown control station alarm in the control room when the devices in the auxiliary shutdown control station are enabled. See also response to 8(a).

3 The control functions transferred to the auxiliary shutdown control station are those for the emergency condenser outlet valves MO 7052 and MO 7062, the main steam isolation valve MO 7050, and the fire water make-up to the emergency condenser SV 4947. The control system of each valve will be individually transferred. The two heat exchanger tube bundles of the emergency condenser are redundant. In the event of a failure of the transfer switch in the outlet valve control, only the operation of the valve associated with that transfer switch will be affected. Were the transfer switch for the main steam isolation valve to fail in transferring control to the auxiliary shutdown control station, it is possible the valve could not be closed and a consequence of this failure could result in the need to provide make-up to the reactor coolant system sooner if the valves downstream from the main steam isolation valve did not close tightly. If the transfer switch for the fire water make-up to the emergency condenser were to fail and the valve could not be operated electrically from either control location, then the valve can be opened manually at the valve.

8. (d) Demonstrate that wiring, including power sources for the control circuit and equipment operation for the alternate shutdown method, is independent of equipment wiring in the area to be avoided.

Response: The power supply, actuating devices, controls and other supporting equipment for achieving hot shutdown are located in the core spray equipment room (which is below the fuel cask unloading dock) or the stairwell outside the core spray equipment room. These two areas are below grade and completely separated from the fire areas of concern. See attached Drawing M100 - Equipment Location - plan above grade.

8. (e) Demonstrate that alternate shutdown power sources, including all breakers, have isolation devices on control circuits that are routed through the area to be avoided, even if the breaker is to be operated manually.

Response: The information provided by 8(a) and 8(d) above provide the requested information.

8. (f) Demonstrate that licensee procedure(s) have been developed which describe the tasks to be performed to effect the shutdown method. A summary of these procedures should be submitted.

Response: Procedures will be prepared for taking the plant to hot shutdown via the auxiliary shutdown control station in the event a fire prevents the use of the main feedwater condenser system and the use of the emergency condenser from the normal control location - the control room. These procedures will be finalized when the detailed design documents are completed and will be implemented, including appropriate training, prior to operation of the facility with the completed fire protection modifications declared operable.

8. (g) Demonstrate that spare fuses are available for control circuits where these fuses may be required in supplying power to control circuits used for the shutdown method and may be blown by the effects of a cable spreading room fire. The spare fuses should be located convenient to the existing fuses. The shutdown procedure should inform the operator to check these fuses.

Response: Spare fuses will be provided for equipment operable from the auxiliary shutdown control station.

8. (h) Demonstrate that the manpower required to perform the shutdown functions using the procedures of (f) as well as to provide fire brigade members to fight the fire is available as required by the fire brigade technical specifications.

Response: By Technical Specifications, two members of the minimum shift crew that are excluded from the fire brigade are required to be on site at all times. These two members provide adequate manpower to safely shut the plant down from either the control room or the safe shutdown area.

8. (i) Demonstrate that adequate acceptance tests are performed. These should verify that: equipment operates from the local control station when the transfer or isolation switch is placed in the "local" position and that the equipment cannot be operated from the control room; and that equipment operates from the control room but cannot be operated at the local control station when the transfer or isolation switch is in the "remote" position.

Response: Preoperational tests (acceptance tests) are required for all modifications. The required tests will incorporate the above criteria.

8. (j) Technical Specifications of the surveillance requirements and limiting conditions for operation for that equipment not already covered by existing Technical Specifications. For example, if new isolation and control switches are added to a service water system, the existing Technical Specifications surveillance requirements on the service water system should add a statement similar to the following:

"Every third pump test should also verify that the pump starts from the alternate shutdown station after moving all service water system isolation switches to the local control position."

Response: Technical Specifications will be submitted which require the demonstration of the operability of the emergency condenser outlet, the main steam isolation and the emergency condenser fire water make-up valves independently both from the control room and the auxiliary shutdown control station each refueling outage.

8. (k) Demonstrate that the systems available are adequate to perform the necessary shutdown functions. The functions required should be based on previous analyses, if possible (eg., in the FSAR), such as a loss of normal ac power or shutdown on a Group I isolation (BWR). The equipment required for the alternate capability should be the same or equivalent to that relied on in the above analysis.

Response: The systems and equipment described in response to 8(a) for performing the shutdown functions when a fire is postulated in the specified areas of the plant are the same systems and equipment that are normally used for reactor coolant inventory control when in the hot standby operation and for the cold shutdown operation. The emergency condenser is the ultimate heat sink on loss of offsite power.

8. (l) Demonstrate that repair procedures for cold shutdown systems are developed and material for repairs is maintained on site.

Response: Emergency power for CRD Pump #1 will be supplied from the diesel generator. Because other contingency operations will require operation of a CRD pump within a short time of their onset, a length of suitable sized cable will be stored for connecting the diesel generator to the CRD pump motor feeder transfer switch near the equipment lock.

In the event fire damage precludes use of a reactor cooling water pump or a shutdown pump in its normal fashion, then one motor of each type of pump will be disconnected from its damaged feeder and connected to circuit breaker connected to a power feed cable permanently connected through containment via the equipment lock. See document referenced in 8(a) above. The exterior end of the feeder cable would then be connected to the emergency generator or to a 480V source connected to present 2400V station power source in the substation.

The emergency condenser is capable of supporting the hot shutdown operation indefinetely, provided make-up water from the fire system to the shell of the condenser is available. However, shutdown cooling can be provided within two days considering the common availability of electrical cable and transformers (from within Consumers Power Company and/or from commercial electrical equipment and materials suppliers) as needed to install a temporary 480V power source connected to the power feeder through containment for the shutdown cooling system. Since there are many options for providing this emergency power source, the most suitable and most expeditious would be selected at the time of this contingency, if it ever occurs. Because of their ready availability, materials and equipment will not be obtained and stored in advance.

Attachment 2

Big Rock Point Plant Fire Protection Modifications

Response to Enclosure 2 Information Requirements of
Generic Letter 81-12 dated February 20, 1981

1. (a) Provide a table that lists all equipment including instrumentation and support system equipment that are required by the alternative or dedicated method of achieving and maintaining hot shutdown.

Response: 1. Systems controlled from the auxiliary shutdown control station:

a. Emergency Condenser

2. Equipment controlled from the auxiliary shutdown control station:

a. Emergency condenser outlet valves M07052 & M07062.
b. Main steam isolation valve M07050.
c. Fire water make-up to emergency condenser SV4947.

3. Instrumentation systems displayed at the auxiliary shutdown control station:

a. Steam drum level.
b. Steam drum pressure.
c. Emergency condenser low-level alarm.
d. Battery and battery charger off-normal alarm.

1. (b) For each alternative shutdown equipment listed in 1a above, provide a table that lists the essential cables (instrumentation, control and power) that are located in the fire area.

Response: The control circuits of the equipment listed under 1a2 above from the transfer switches located in the auxiliary shutdown control station to the control switches located in the control room are routed through the fire area.

1. (c) Provide a table that lists safety related and non-safety related cables associated with the equipment and cables constituting the alternative or dedicated method of shutdown that are located in the fire area.

Response: The power source, the controls and the electrical circuitry of the emergency condenser inlet valves are located in one or more of the fire areas.

1. (d) Show that fire-induced failure of the cables listed in b and c above will not prevent operation or cause maloperation of the alternative or dedicated shutdown method.

Response: Fire damaged control circuity of the equipment described in 1b above will be disconnected by operation of the transfer switch which, at the same time, enables the auxiliary shutdown control station control switches.

Fire damage and consequential closing of the emergency condenser inlet valves will be prevented by removing operating power from the valves,

after checking the valves open prior to reactor operation. This will be implemented by an addition to the operating procedures similar to the requirement for removing the operating power from the shutdown cooling system valves MO7056, 7057, 7058 and 7059.

Additional information describing system interactions is provided by Attachment 1 which responds to Enclosure 1 of Generic Letter 81-12.

1. (e) For each cable listed in 1b above, provide detailed electrical schematic drawings that show how each cable is isolated from the fire area.

Response: The requested information is provided by 1d above and Figure 1 of Consumers Power Company submittal dated March 19, 1981.

2. (a) Identify each high-low pressure interface that uses redundant electrically controlled devices (such as two series motor operated valves) to isolate or preclude rupture of any primary coolant boundary.

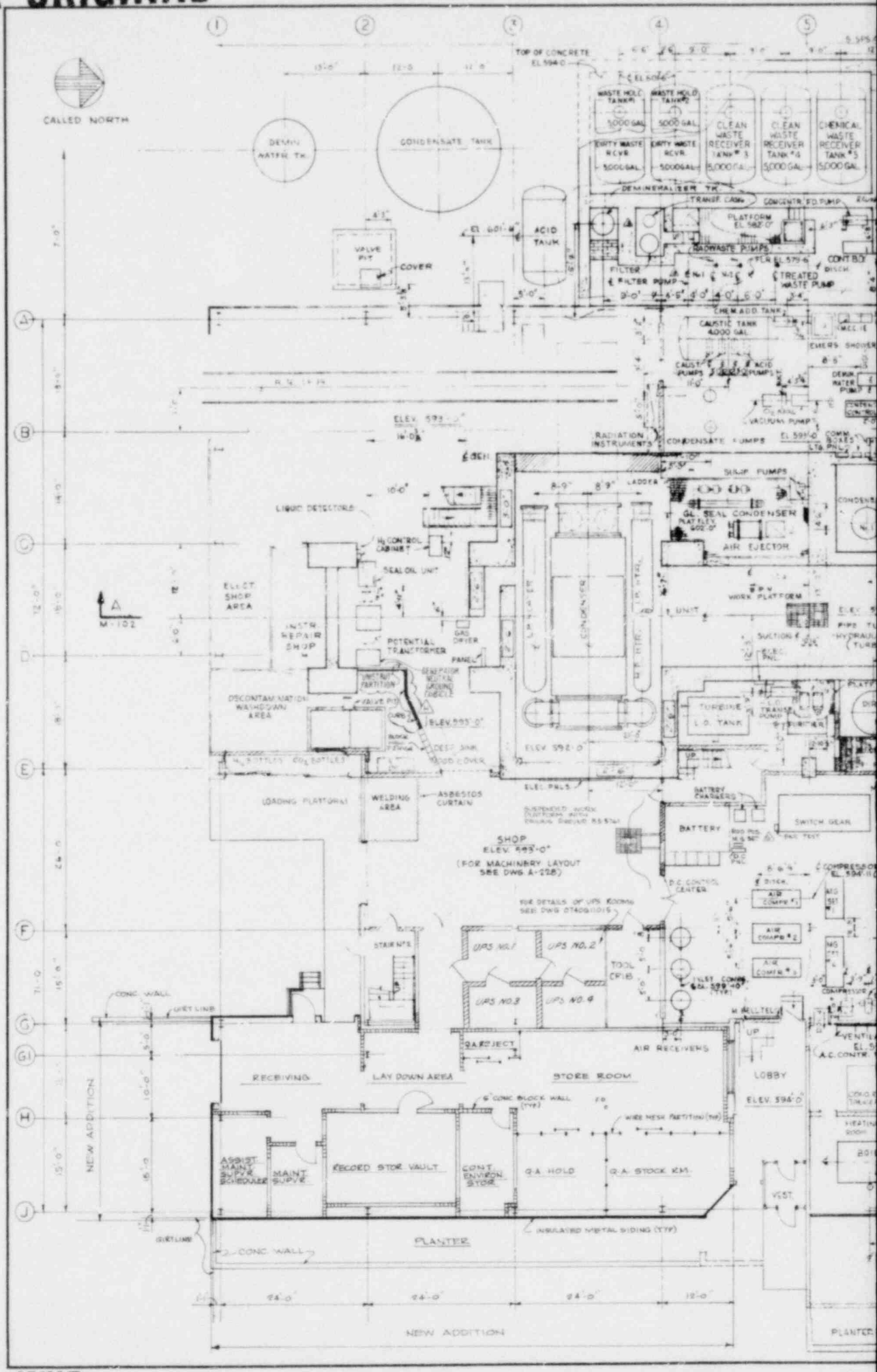
(b) Identify the device's essential cabling (power and control) and describe the cable routing (by fire area) from source to termination.

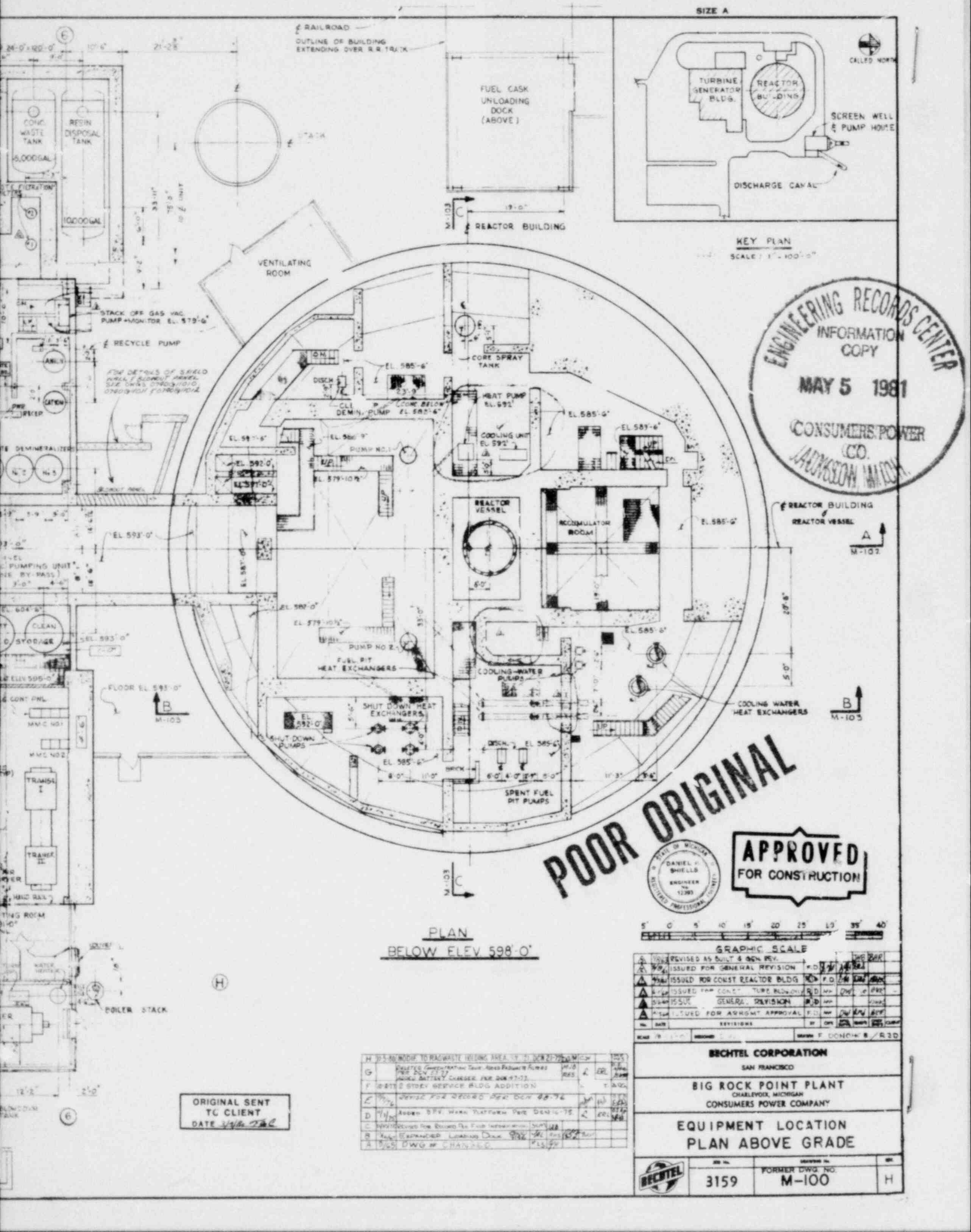
(c) Identify each location where the identified cables are separated by less than a wall having a three-hour fire rating from cables for the redundant device.

(d) For the areas identified in item 2c above (if any), provide the bases and justification as to the acceptability of the existing design or any proposed modifications.

Response: The single system containing redundant electrically controlled valves at the interface of high and low pressure systems is the shutdown system. Existing operating procedures require electrical power for these valves to be disconnected prior to raising the pressure of the reactor coolant system. (See CPCo letter DABixel to DLZiemann, dated March 26, 1979.) The cleanup system does present an additional interface of high and low pressure systems during resin sluicing from the cleanup demineralizer. This interface is not considered a significant problem because resin sluicing is an operator attended action and only occurs on the order of twice per year during reactor operation for a period of approximately four hours each. Therefore, the interface creating the potential problem occurs so infrequently that it is not considered necessary to address. It should be noted that one of the valves at each of the interfaces is pneumatically controlled and that the postulated electrical failure is associated with its closure signal which is received from an electrical pressure indicator in the cleanup demineralizer or the Containment Isolation System.

POOR ORIGINAL





SIZE A
℄ RAILROAD
OUTLINE OF BUILDING EXTENDING OVER R.R. TRACK
FUEL CASK UNLOADING DOCK (ABOVE)
STACK
CONC. WASTE TANK
RESIN DISPOSAL TANK
5,000 GAL
10,000 GAL
℄ REACTOR BUILDING
VENTILATING ROOM
STACK OFF GAS VAC. PUMP + MONITOR EL. 579'-6"
℄ RECYCLE PUMP
CORE SPRAY TANK
EL. 585'-6"
HEAT PUMP EL. 592'
COOLING UNIT EL. 592'
DEMIN. PUMP
PUMP NO. 1
REACTOR VESSEL
RECIRCULATOR ROOM
EL. 593'-0"
EL. 582'-0"
EL. 579'-10½"
PUMP NO. 2
FUEL PIT HEAT EXCHANGERS
COOLING-WATER PUMPS
SHUT DOWN HEAT EXCHANGERS
SHUT DOWN PUMPS
SPENT FUEL PIT PUMPS
COOLING WATER HEAT EXCHANGERS
℄ REACTOR BUILDING & REACTOR VESSEL
FLOOR EL. 593'-0"
MMC NO. 1
MMC NO. 2
TRANSF. I
TRANSF. II
BOILER STACK
TURBINE GENERATOR BLDG.
REACTOR BUILDING
SCREEN WELL & PUMP HOUSE
DISCHARGE CANAL
CALLED NORTH
KEY PLAN
SCALE: 1" = 100'-0"
PLAN
BELOW ELEV. 598'-0"
GRAPHIC SCALE
ENGINEERING RECORDS CENTER INFORMATION COPY MAY 5 1981 CONSUMERS POWER CO. JACKSON, MICH.
POOR ORIGINAL
APPROVED FOR CONSTRUCTION
STATE OF MICHIGAN DANIEL H. SHIELLS ENGINEER No. 12393 REGISTERED PROFESSIONAL ENGINEER
ORIGINAL SENT TO CLIENT DATE
H 11-5-80 MODIF. TO RADWASTE HOLDING AREA PER DCN 21-79
G DELETED CONCENTRATION TANK, ADDED RADWASTE PUMPS PER DCN 11-77; ADDED BATTERY CHARGER PER DCN 47-73
F 2 STORY SERVICE BLDG ADDITION
E REVISE FOR RECORD PER DCN 48-76
D ADDED SPV WORK PLATFORM PER DCN 16-75
C REVISED FOR RECORD PER FIELD INFORMATION
B EXPANDED LOADING DOCK
A DWG # CHANGED
REVISED AS BUILT & GEN. REV.
ISSUED FOR GENERAL REVISION
ISSUED FOR CONST REACTOR BLDG
ISSUED FOR CONST. TURB. BLDG. ONLY
ISSUED GENERAL REVISION
ISSUED FOR ARRGMT APPROVAL
REVISIONS
BECHTEL CORPORATION
SAN FRANCISCO
BIG ROCK POINT PLANT
CHARLEVOIX, MICHIGAN
CONSUMERS POWER COMPANY
EQUIPMENT LOCATION
PLAN ABOVE GRADE
3159
FORMER DWG. NO. M-100
H

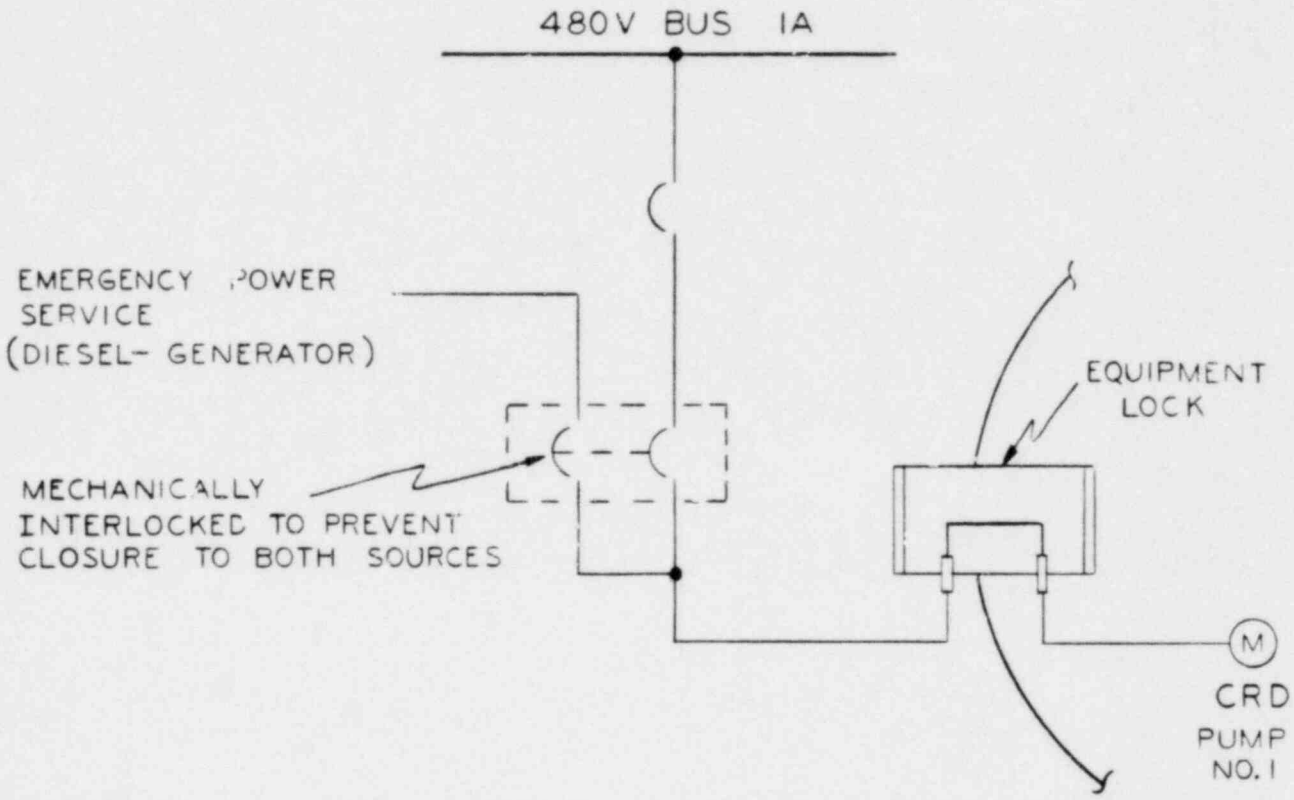


FIGURE 1

SECTION HEAD DATE APP DIVISION HEAD APP DEPARTMENT HEAD APP	DR NCM 5-4-81 CONSUMERS POWER CO. JACKSON, MICHIGAN	CK BIG ROCK POINT PLANT CONTROL ROD DRIVE PUMP NO. 1 OPERATING POWER SOURCE NO SHEET