Consumers Power

POWERING MICHIGAN'S PROGRESS

Big Rock Point Nuclear Plant, 10269 US-31 North, Charlevoix, MI 49720

William L Beckman
*Plant Manager*

December 30, 1992

Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

DOCKET 50-155 - LICENSE DPR-6 - BIG ROCK POINT PLANT -
REVISED RESPONSE TO GENERIC LETTER 91-11: RESOLUTION OF GENERIC ISSUES 48, "LCOs FOR CLASS 1E VITAL INSTRUMENT BUSES," AND 49 "INTERLOCKS AND LCOs FOR CLASS 1E TIE BREAKERS" PURSUANT TO 10 CFR 50.54(f)

Pursuant to Section 50.54(f) of Title 10 of the Code of Federal Regulations and Section 182 of the Atomic Energy Act, the original submittal dated January 29, 1992, provided the certification that appropriate procedures and administrative controls conforming to the guidance provided in Enclosure 1 to the Generic Letter had been implemented. However, after review, the Office of Nuclear Reactor Regulation (NRR) expressed a concern through the NRR Project Manager that there were no procedural time limitations (operability requirements) placed on the inverter or other onsite power sources that supply 120 V AC to the Reactor Protection System Bus No. 3. Per a conference call between NRR and Big Rock Point Staff on December 1, 1992, a revised response was agreed upon to provide the basis for this position.

William L Beckman
Plant Manager

CC: Administrator, Region III, USNRC
NRC Resident Inspector - Big Rock Point

ATTACHMENT

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CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT
Docket 50-155 - License DPR-06

At the request of the Commission and pursuant to the Atomic Energy Act of 1954 and the Energy Reorganization Act of 1974, as amended, and the Commission's Rules and Regulations thereunder, Consumers Power Company submits our revised response to NRC letter dated July 17, 1991, entitled, "Response to Generic Letter 91-11; Resolution of Generic Issues 48, LCOs for Class 1E Vital Instrument Buses, and 49, Interlocks and LCOs for Class 1E Tie Breakers, Pursuant to 10 CFR 50.54(f)". Consumers Power response is dated December 30, 1992.

CONSUMERS POWER COMPANY

To the best of my knowledge, information and belief, the contents of this submittal are truthful and complete.

BY _____
David P Hoffman, Vice President
Nuclear Operations

Sworn and subscribed to before me this 30th day of December 1992.

_____
Beverly A. Avery, Notary Public
Jackson County, Michigan

My commission expires December 3, 1996

( SEAL )

ATTACHMENT 1

Consumers Power Company
Big Rock Point Plant
Docket 50-155

# REVISED RESPONSE TO GENERIC LETTER 91-11

December 30, 1992

6 Pages

# ATTACHMENT 1
# REVISED RESPONSE TO GENERIC LETTER 91-11

## 1.0 SYSTEM DESCRIPTION

### Class 1E Buses

- 480 V Emergency Bus MCC-2B

### Vital Instrument Buses

- 115 V Reactor Protection System Bus 1
- 115 V Reactor Protection System Bus 2
- 120 V Reactor Protection System Bus 3

### Vital Instrument Panels

- Panel 1Y
- Panel 2Y
- Subpanel 2Y
- Panel 3Y

### Inverters

- Topaz Static Inverter; RPS Bus 3 normal supply
- Rod Position Indication Motor-Generator set

### Tie Breakers Connecting Redundant Class 1E Buses at Big Rock Point

- None

### Discussion

The Big Rock Point Station Power System has a single Class 1E Motor Control Center (MCC-2B) Bus. This 480 V Emergency Bus is normally powered by Motor Control Center 2A via the Bus 2A-2B tie through breaker 52-2A2B. MCC-2A draws its power from the 480 V Load Center Bus 2 via breaker 52-2A, and in turn is powered by the 2400 V Station Power Bus via Station Power Transformer (2400/480V) No. 22. An alternate power supply path for the MCC-2B Emergency Bus exists from the 2400 V Station Power Bus via the Station Power Transformer (2400/480V) No. 11, the 480 V Load Center Bus 1, breaker 52-1A, the Motor Control Center 1A, and along the Bus 1A-2B Tie via breaker 52-1A2B. Note that both Station Power Transformers are energized by the same 2400 V switchgear which is supplied by a voltage regulating transformer through Station Power Transformer No. 1 from the unit generator, the 138 kV grid or the 46 kV grid. In the event that the previously described paths are unavailable, the MCC-2B Emergency Bus can be fed from the Emergency Diesel Generator or the Standby Diesel Generator.

The 115 V Reactor Protection System (RPS) Buses 1 and 2 are powered by separate motor generator (MG) sets. The motor inputs are taken from MCC-1A and MCC-2A respectively. The MG sets are mechanically coupled to inertia flywheels, enabling them to ride out minor system voltage disturbances. A complete loss of supply for 10 seconds can be tolerated by the sets without causing reactor protection system operation due to

low voltage. The 120 V Reactor Protection System Bus 3 (Neutron Monitoring Bus) is normally powered by an inverter from the 125 V DC Distribution Panel No. 1.

An alternate 115 V supply can be switched to either of the two Reactor Protection System Buses or to the Neutron Monitoring Bus No. 3 via Panel 1Y. This alternate supply is interlocked so that only one of these three buses can be supplied at any one time by the alternate power supply.

Panels 1Y, 2Y, subpanel 2Y and 3Y are normally fed by MCC-1A. If MCC-1A is lost, an automatic throwover operates to supply power from the MCC-2B Bus. Refer to Attachment 4 for the loads carried by Panels 1Y, 2Y, subpanel 2Y and 3Y.

The Rod Position Indication System is normally powered by Panel 1Y, but can be backed-up by a motor-operated set (inverter) that starts automatically upon loss of power to Panel 1Y. This motor-generator set (inverter) is fed by the 125 V DC Distribution Panel No. 1.

The vital instrument buses and panels are unique to themselves; there is no redundancy in instrumentation between them.

Attachment 2 of this submittal is a simplified diagram of the Big Rock Point Station Power System. Attachment 3 represents the Reactor Protection System Buses.

2.0 GENERIC LETTER RECOMMENDED ACTION

A. Time Limitations and Surveillance Requirements for Vital Instrument Buses and Panels

Time Limitations

At Big Rock Point, the vital instrument buses and panels are indirectly required by Technical Specifications to be operational at all times during power operation and refueling. Limiting Conditions of Operation are determined by the affected instruments/controls associated with the bus/panel. There are no limitations associated with inoperability of vital instrument buses or panels because of this design.

Surveillance Requirements

Tests are performed in accordance with Technical Specifications to insure the operability of the instruments/controls associated with the vital buses/panels.

B. Time Limitations and Surveillance Requirements for Inverters and Other On-Site Power Sources to the Vital Instrument Buses and Panels

Big Rock Point Technical Specifications and procedures contain time limitations and surveillance requirements concerning the major on-

site power sources to the vital instrument buses and panels (refer to Attachment 5).

Rod Position Indication Motor-Generator Set

To ensure the operability of the Control Rod Position Indication System, a motor-generator set (inverter) is used to backup the normal 1Y power supply. Operability is tested monthly using Operations Surveillance Procedure T30-05, Monthly Operational Test of Control Rod Position M-G Set.

The power source for the motor-generator set is the 125 V DC station battery. Technical Specifications require the Station Batteries to be operable under all conditions except cold shutdown, therefore directly affecting the operability of the inverter.

Topaz Static Inverter

To ensure the operability of RPS Bus 3, two static power inverters are available. One is installed and operable, and the other unit is stored on-site as a spare. The power source for the inverter is the 125 V DC station battery. Technical Specifications require the Station Batteries to be operable under all conditions except cold shutdown, therefore directly affecting the operability of the inverter and ultimately RPS Bus 3. If the inverter is removed from service, the operator can transfer the RPS Bus 3 power source to the alternate 120 V AC power supply Panel 1Y in accordance with Standard Operating Procedures.

Each refueling outage these inverters are exchanged, and the removed inverter is sent to an offsite lab for testing. The tested inverter is then usually returned to the site before power operation, however there is no requirement to do so.

Recommended Action per Generic Letter 91-11

Ensure that your plant has procedures that include time limitations and surveillance requirements for inverters or other onsite power sources to the vital instrument buses. If plant procedures do not include time limitations for inverters or other onsite power sources to the vital instrument buses, the basis for such a position must be adequately evaluated. The evaluation should address existing regulations and plant design bases, and should specifically demonstrate that adequate consideration has been given to the possibility of loss of offsite power that coincides with a worst-case additional single failure. In addition, the analysis should consider the time delay required for the emergency generators to pick up loads, because in typical plants, if an inverter serving a vital instrument bus is not available, a loss of offsite power will cause numerous actuations because of the delay time while the diesel generators are starting. Therefore the analysis should also consider malfunctions that do not always have a preferred failure mode, (e.g., instrumentation or controls that initiate a switch of emergency core cooling from injection to recirculation or initiate isolation of the steam generators). If the alternate power sources for the vital buses

ATTACHMENT 1
REVISED RESPONSE TO GENERIC LETTER 91-11

cannot receive power from the diesel generators, the evaluation should include this condition.

Evaluation

1. Existing Regulations and Plant Design Bases

Time limitations (operability requirements) for the inverter or other alternate power sources that supply the 120 V [illegible] RPS Bus 3 are not included in plant procedures, which is contrary to the recommended actions per Generic Letter 91-11. Therefore, the basis for such a position is required to be evaluated.

Big Rock Point was evaluated by the Systematic Evalu[illegible] Program (SEP) which was initiated in February 1977 by the US [illegible]ear Regulatory Commission to review the designs of older operating nuclear reactor plants to reconfirm and document their safety. As you are well aware, Big Rock Point was licensed prior to the publication of 10 CFR 50, Appendix A, "General Design Criteria" (GDC) for Nuclear Power Plants", specifically GDC 17, 21, 34 and 35.

The SEP review identified topics that related to Electrical Power Reliability, and Big Rock Point responded with satisfactory completion of these topics documented by the NRC Staff in NUREG-0828, Integrated Plant Safety Assessment - Systematic Evaluation Program; Big Rock Point Plant, dated May 1984.

Systems required to bring the Big Rock Point nuclear reactor from hot shutdown to cold shutdown with only offsite or onsite power available with a single failure meet the current NRC criteria. However, the vital indications in the control room such as reactor pressure, temperature and level indicators can be lost given a single failure. The initial recommendation of the NRC Staff was that a design modification be incorporated such that independent and redundant indication of the process variables that are vital for the safe shutdown of the reactor are available in the control room. This requirement was analyzed in SEP Topic VII-3, Systems Required For Safe Shutdown, and the following conclusion was reached:

> "There are two facts relevant to this issue. First, in the current Big Rock Point design there is only one dedicated diesel connected to the 480 kV emergency bus (a second diesel generator is available, however credit is not taken for its use within the first three and a half hours following an accident sequence initiator). Given a total loss of AC power which implies loss of vital instrumentation in the control room, the plant can be shutdown and cooled down for at least four hours. (This is due to the fact that the emergency condenser has sufficient inventory to cool the reactor for four hours and the only normally closed valves in this system are DC powered and have control room indication. This offers a reasonable period of time to try to recover

either offsite power or the onsite emergency power.) Second, a failure that would affect only the shutdown panel does not affect the operability of the safety systems required to shutdown Big Rock Point. Based on these facts, addition of a redundant vital instrumentation panel does not seem to offer much in the way of reduction of risk due to operation of this plant."

Additionally, the issues in Regulatory Guide 1.97 (Detailed Control Room Design Review and the Safety Parameters Display System) as they apply to Big Rock Point have been resolved, and are documented in NRC Safety Evaluation to Consumers Power Company dated 7/11/90 and additional letter 8/22/90.

2. Time Delay for EDG to Pick Up Loads

The only instrument fed from RPS Bus 3 is Neutron Monitoring Channel 3. If RPS Bus 3 becomes inoperable, a "Downscale Alarm" will be annunciated in the control room and a control rod withdrawal block will occur (this function is tested every 30 days using Reactor Protection System Surveillance Test T30-01).

NOTE: In accordance with Technical Specifications, any one of three power range monitors may be taken out of service for surveillance testing or maintenance during reactor operation for the reason that a trip on either of the two remaining channels shall scram the reactor. There is no time limitation associated with this condition.

There are no Engineered Safeguards Features (ESF) associated with Channel 3 (other than RPS logic described above) that would be affected after a loss of offsite power coinciding with a worst case additional single failure as described in SEP Topic VII-3, therefore "malfunctions that do not always have a preferred failure mode" are not applicable in the operation of RPS Bus 3. Furthermore, even though the alternate power supply, Panel 1Y, for RPS Bus 3 can receive power from the Emergency Diesel Generator (EDG), it is unlikely that the operator would power RPS Bus 3 from the alternate source, if that source was receiving power from the EDG. The alternate power supply is common to the three vital instrument buses, and is designed to be manually controlled from the control room. This alternate power supply controller is interlocked so that only one of these three buses can be supplied at any one time from Panel 1Y. Station procedures direct the operator to transfer RPS Bus 1 to the alternate power supply if a loss of station power has occurred. This bus offers the operator Neutron Monitoring Channels 1 (wide range) and 7 (source range), four out of eight incore monitors and an air ejector off-gas monitor. Therefore the time delay associated with a EDG starting and picking up load is inconsequential in regards to RPS Bus 3.

Position Summary

RPS Bus 3 only provides an additional neutron monitoring channel; there are no ESF actuations associated with this bus. If RPS Bus 3 is inoperable, a trip on either of the two remaining channels will scram the reactor.

During a loss of offsite power (EDG or Standby Diesel Generator operating) other means exist to determine flux levels in the reactor. In the control room, reactor pressure, level, control rod position indications are available. In the Alternate Shutdown Building (Appendix R), completely separate from the control room, steam drum pressure and level indication is available (EDG not required) to indirectly monitor the increase or decrease of heat production in the reactor core. (Consumers Power Company identified no need for flux/power level indication in the Alternate Shutdown Building in a letter submitted to the NRC dated September 24, 1981. By a NRC Safety Evaluation dated March 8, 1983, the NRC concurred with Consumers's position.) The Alternate Shutdown batteries can support connected loads for 72 hours following a loss of offsite power if the EDG is unavailable.

For these reasons, including time limitations on the Topaz Static inverter and other onsite power sources to the 120 V AC RPS Bus 3 in plant procedures is not warranted.

C. Time Limitations and Surveillance Requirements for Tie Breakers That Connect Redundant Class 1E Buses at One Unit or That Can Connect Class 1E Buses Between Units at the Same Site

Not applicable to Big Rock Point, because redundant buses are not utilized in the licensed design.

3.0 CONCLUSION

The primary objective of Generic Letter 91-11 is to verify that plants are not being operated in violation of applicable regulations. Consumers Power Company is confident that the electrical configurations, administrative controls and surveillance procedures at Big Rock Point conform to existing SEP regulatory requirements.

ATTACHMENT 2

Consumers Power Company
Big Rock Point Plant
Docket 50-155

**STATION POWER SYSTEM**

Revised Response to Generic Letter 91-11

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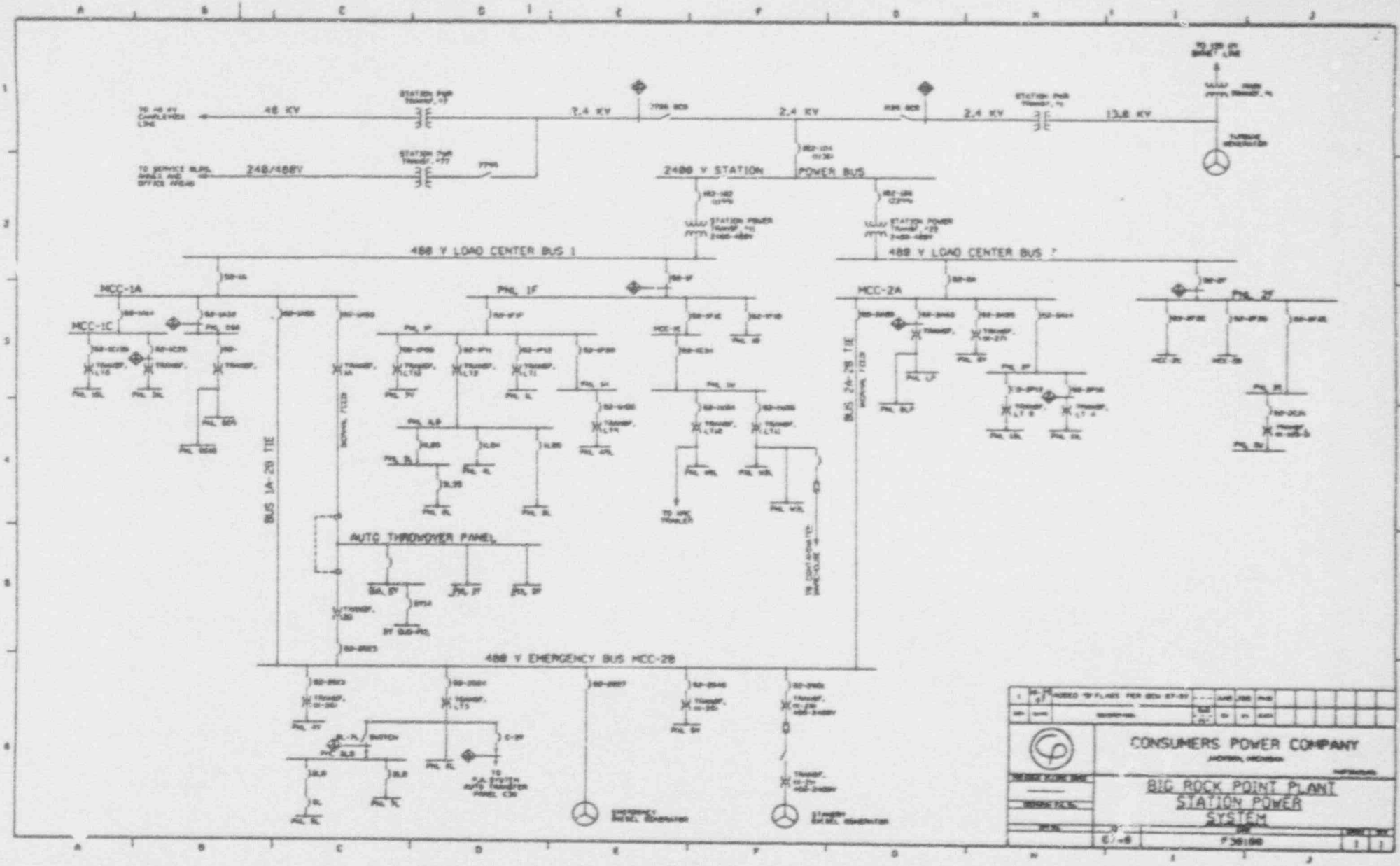
1 Page

ATTACHMENT 2



ATTACHMENT 3

Consumers Power Company
Big Rock Point Plant
Docket 50-155

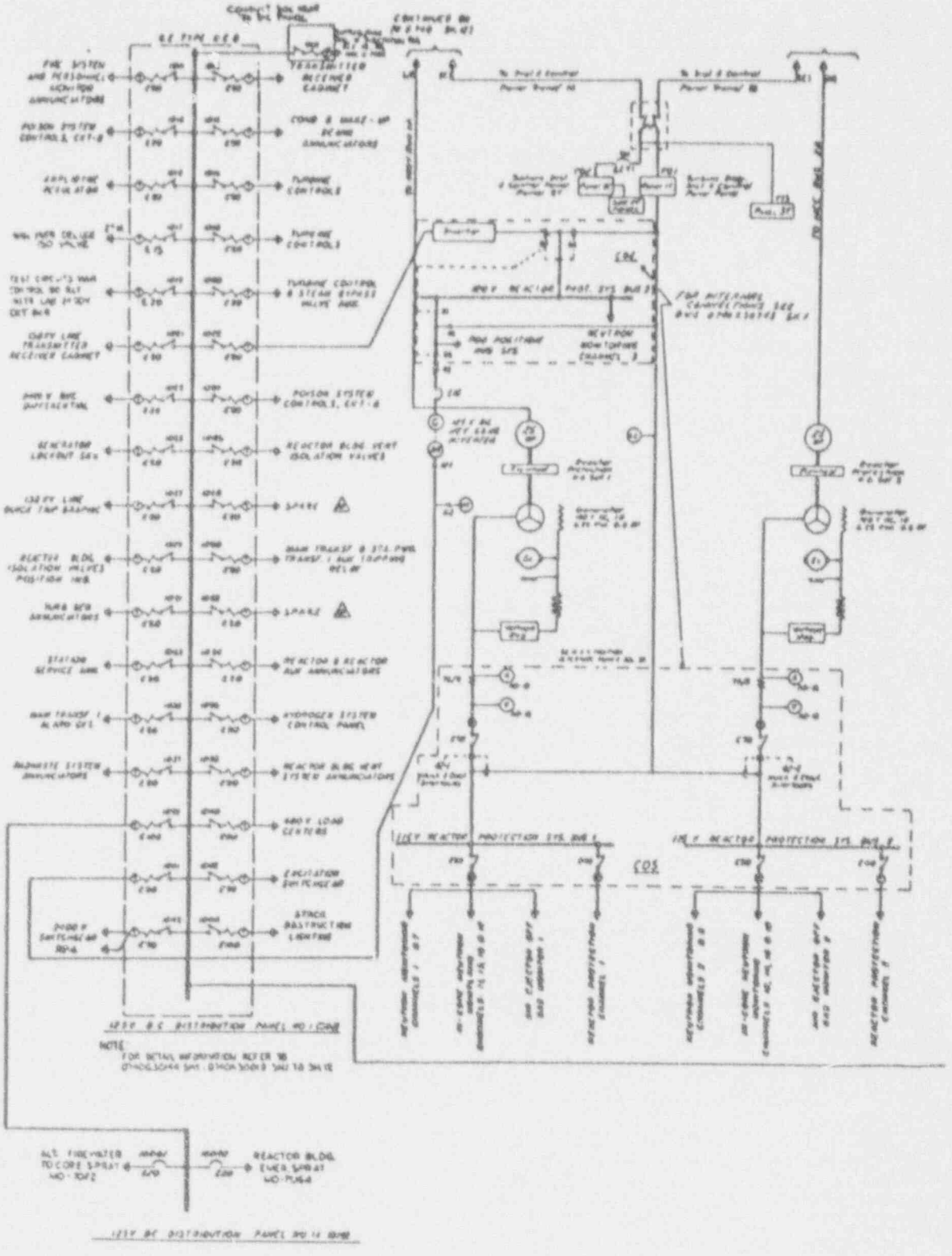
**REACTOR PROTECTION SYSTEM BUSES**

Revised Response to Generic Letter 91-11

December 30, 1992

1 Page

ATTACHMENT 3



ATTACHMENT 4

Consumers Power Company
Big Rock Point Plant
Docket 50-155

# VITAL PANEL LOADS

Revised Response to Generic Letter 91-11

December 30, 1992

5 Pages

# TABLE 11
## 120/208 VOLT PANEL 1Y
## (TURBINE BUILDING - AIR COMPRESSOR/ELECTRICAL EQUIPMENT ROOM 105)
## (SCHEME 1503)

E-009 21

| SWITCH NO. | DESCRIPTION (LEFT-HAND SIDE) | SCHEME | DRAWING NO. | SHEET |
|---|---|---|---|---|
| - | (Main Lug) 1Y Feed From MCC-1A, Position 52-1A53 | 1501 | E-101 | 1 |
| | Backup Feed From MCC-2B, Position 52-2B23 | 1502 | E-101 | 1 |
| 1 | 2400V Switchgear Relay Test | 1505 | | |
| 3 | Hydrogen Control Panel | | | |
| 5 | Feedwater System Valve Controls | 2501 | E-109 | 1 |
| 7 | Condensate System Valve Controls | 2502 | E-110 | 1 |
| 9 | Diesel Fire Pump | 3501 | E-114 | 1 |
| 11 | Spare | | | |
| 13 | Turbine Bypass Valve Controls | 9502 | E-107 | 1 |
| 15 | Reactor Vessel Instrumentation | ID10 | G30739 | 2 |
| | | 6001 | G30739 | 2 |
| | | 6803 | G30739 | 1 |
| | | 6807 | G30739 | 2 |
| 17 | Area Monitoring | 6952 | F30762 | 1 |
| | Turbine and Sphere Cam Remote Alarm | 6956 | E-115 | 1 |
| | High Radiation Vent Isolation Logic | 8511 | E-114 | 2 |
| 19 | Reactor Control Rod Positioning | 6511 | F30731 | 1 |
| | | 6512 | F30731 | 2 |
| 21 | Neutron Chamber Positioning System | 6516 | G30739 | 2 |
| | | 6517 | G30739 | 2 |
| 23 | Reactor Building Level Indication | 6503 | E-114 | 1 |
| 25 | Air Ejector Valve Controls | 7502 | E-115 | 1 |
| 27 | Air Ejector Off Gas Monitor Valves and Timer | | | |
| 29 | Condensate Demineralizer Control Panel | 4504 | | |
| | $O_2$ Analyzer | 4505 | E-110 | 1 |
| 31 | Control Panel C26 | 1512 | E-11 | |
| 33 | Turbine Trip and Test Controls | 9503 | E-107 | |
| 35 | Manual Loader Bypass Vlv Rod Hydraulic System | 6521 | G30739 | |
| 37 | Area Monitor Cooling Power Supplies | | | |

## 120/208 VOLT PANEL 1Y
(TURBINE BUILDING - AIR COMPRESSOR/ELECTRICAL EQUIPMENT ROOM 105)
(SCHEME 1503)

E-009 21

| SWITCH NO. | DESCRIPTION (RIGHT-HAND SIDE) | SCHEME | DRAWING NO. | SHEET |
|---|---|---|---|---|
| 2 | Control Room Relay Test | 1507 | G30708 | |
| 4 | Turbine Selsyns | 9501 | E-107 | 1 |
| 6 | Exciter Switchgear | 1509 | G30141 | |
| 8 | Control Panel C02 Process Recorders | FI2325 | E-104 | 1 |
| | | FI2326 | E-104 | 1 |
| | | FI2327 | E-104 | 1 |
| | | FI2328 | E-104 | 1 |
| | | 9801 | E-107 | 1 |
| | | 9802 | E-107 | 1 |
| | | 9901 | E-107 | 1 |
| | | 9902 | E-107 | 1 |
| | | 2801 | E-109 | 1 |
| | | 2802 | E-110 | 1 |
| | | 2901 | E-110 | 1 |
| | | ---- | E-110 | 1 |
| | | ---- | E-105 | 1 |
| | | ---- | E-106 | 1 |
| | | 6702 | G30734 | 3 |
| | | 6804 | G30739 | 1 |
| 10 | Reactor Building Transmitters | 8505 | E-117 | 1 |
| | | 8512 | E-114 | 2 |
| | | 8507 | E-117 | 1 |
| 12 | Shutdown System Valve Control Auxiliary | 6504 | E-112 | 1 |
| 14 | Transformer Deluge Local Bell Alarms | 1702 | M740-G19 | 2 |
| 16 | Process Radiation Instruments | 6951 | | |
| 18 | Radiation Recorders | 8507 | E-117 | 1 |
| | | 6805 | G30739 | 1 |
| | | 6954 | G30739 | 1 |
| | | | G30739 | 2 |
| | | 6809 | G30739 | 2 |
| | | 6810 | G30739 | 2 |
| | | 6934 | F30760 | 1 |
| | | 6935 | F30760 | 1 |
| | | 6936 | F30760 | 1 |
| | | 6937 | F30760 | 2 |
| | | 6938 | F30760 | 2 |
| | | 6941 | F30761 | 1 |
| | | 6942 | F30761 | 1 |
| | | 6943 | F30761 | 1 |
| | | 6944 | F30761 | 1 |
| | | 6945 | F30761 | 1 |
| | | 6946 | F30761 | 1 |
| | | 6947 | F30761 | 1 |
| | | 6948 | F30761 | 1 |
| | | 6952 | F30761 | 2 |
| | | | G32012 | 1 |

| SWITCH NO. | DESCRIPTION (RIGHT-HAND SIDE) | SCHEME | DRAWING NO. | SHEE |
|---|---|---|---|---|
| 20 | Reactor Protection System Standby Power | 6514 | C30743 | 1 |
| 22 | Radwaste Control Panel C06 | 7503 | E-115 | 1 |
| | | 7804 | E-115 | 1 |
| | | 7802 | E-115 | 2 |
| 24 | Radwaste System Valve Controls | 7501 | E-115 | 1 |
| 26 | RDS System Panel C40 | | | |
| 28 | Makeup Demineralizer Control Panel C27 | 4501 | E30878 | 1 |
| 30 | Security Building Receptacles | | | |
| 32/34 | Michigan Bell Company Equipment | | | |
| 36 | Plant Radio Equipment | | | |
| 38 | Domestic Water Accumulator Controller | 5409 | E-113 | |

## TABLE 13
## 120/208 VOLT PANEL 2Y
## (REACTOR BUILDING - PERSONNEL LOCK AREA ROOM 447)
## (SCHEME 1504)

E-009 22

| SWITCH NO. | DESCRIPTION (LEFT-HAND SIDE) | SCHEME | DRAWING NO. | SHEET |
|---|---|---|---|---|
| - | (Main Lug) 2Y Feed From MCC-1A, Position 52-1A53 | 1501 | E-101 | 1 |
| | Backup Feed From MCC-2B, Position 52-2B23 | 1502 | E-101 | 1 |
| 1 | Reactor Cooling Water Auxiliary | 5501 | E-113 | 1 |
| | | 6509 | E-115 | 2 |
| 3 | Control Panels C20 and C22 | 6811 | C30739 | 4 |
| | | 6802 | E-113 | 1 |
| | | 6812 | E-111 | 1 |
| | | 8504 | E-117 | 1 |
| 5 | Cleanup Demineralizer Control Panel | 8506 | E-117 | 1 |
| | | 1510 | E-117 | 1 |
| 7 | Cleanup Demineralizer Control Valves | 6801 | E-112 | 1 |
| | | 6505 | E-112 | 1 |
| 9 | Poison Syst, Shutdown Syst, CRD Pump Press Ind | 6507 | E-115 | 2 |
| 11 | Control Rod Temperature Indication | 6506 | E-112 | 1 |
| 13 | Control Rod Transmitters | 6522 | C30739 | 3 |
| 15 | Recirculation Pump Room Deluge Valve | 68[illegible] | C30739 | 2 |
| | | 3703 | E-114 | 2 |

| SWITCH NO. | DESCRIPTION (RIGHT-HAND SIDE) | SCHEME | DRAWING NO. | SHEET |
|---|---|---|---|---|
| 2 | Reactor Building Crane Interlocks | 6520 | E-111 | 1 |
| 4 | Reactor Building Continuous Air Monitor (CAM) | | | |
| 6 | Reactor Shutdown System Interlock Valve | 6501 | E-112 | 1 |
| 8 | Emergency Condenser Makeup Valve | 6502 | E-112 | 1 |
| 10 | Emergency Condenser Level Transm LT-3150 | 6510 | E-112 | 1 |
| 12 | Recirculating Pumps and Reactor Transmitters | 6806 | C30739 | 1 |
| 14/16 | 120/208 Volt Feed to 2Y Subpanel | | | |

## TABLE 14
## 120/208 VOLT 2Y SUBPANEL
## (REACTOR BUILDING - PERSONNEL LOCK AREA ROOM 447)

E-009 22

| SWITCH NO. | DESCRIPTION (LEFT-HAND SIDE) | SCHEME | DRAWING NO. | SHEET |
|---|---|---|---|---|
| - | (Main Lug) 2Y Subpanel Feed From Panel 2Y, Position 14/16 | | | |
| 17 | Spare | | | |
| 19 | Spare | | | |
| 21 | Spare | | | |
| 23 | Spare | | | |

| SWITCH NO. | DESCRIPTION (RIGHT-HAND SIDE) | SCHEME | DRAWING NO. | SHEET |
|---|---|---|---|---|
| 16 | Area Radiation Monitor (ARM) RE-8258 | 6952 | F30762 | 1 |
| 18 | Spare | | | |
| 20 | Spare | | | |
| 22 | Spare | | | |

ATTACHMENT 4

TABLE 12
120/208 VOLT PANEL 3Y
(TURBINE BUILDING - AIR COMPRESSOR/ELECTRICAL EQUIPMENT ROOM 105)

E-009 29

| SWITCH NO. | DESCRIPTION (LEFT-HAND SIDE) | SCHEME | DRAWING NO. | SHEET |
|---|---|---|---|---|
| - | (Main Lug) 3Y Feed From MCC-1A, Position 52-1A53 | 1501 | E-101 | 1 |
| | Backup Feed From MCC-2B, Position 52-2B23 | 1502 | E-101 | 1 |
| 1 | Reactor Bldg Water Level Transmitter LT-3171 | 6821 | E-104 | 1 |
| | Reactor Bldg Pressure Transmitter PT-200 | 6815 | E-104 | 1 |
| 3 | Reactor Core Spray Flow Transmitter PT-2162 | FI2327 | E-104 | 1 |
| | Reactor Enclosure Spray Flow Transm FT-2164 | FI2325 | E-104 | 1 |
| 5 | Reactor Core Spray Flow Backup FT-2163 | FI2328 | E-104 | 1 |
| | Reactor Enclosure Spray Flow Backup FT-2161 | FI2326 | E-104 | 1 |
| 7 | Relief Valve Monitoring System | 6813 | G32001 | 1 |
| 9 | High Range Monitors RI-8322 and RI-8323 | | | |
| 11 | Reactor Bldg Water Level Transmitter LT-3175 | 6817 | E-104 | 1 |
| | Reactor Bldg Pressure Transmitter PT-201 | 6816 | E-104 | 1 |

| SWITCH NO. | DESCRIPTION (RIGHT-HAND SIDE) | SCHEME | DRAWING NO. | SHEET |
|---|---|---|---|---|
| 2 | Core Spray Line Pressure PT-186/PI-412 | 5801 | E-104 | 1 |
| | Reactor Pressure PT-1A07C | 6803 | G30739 | 1 |
| 4 | Pipe Tunnel Damper Position Indication | 8510 | G31040 | 1 |
| 6 | Access Control System (Card Readers) | | | |
| 8 | Spent Fuel Pool Level Indication | 5803 | E-104 | 1 |
| 10/12 | Fire Detection Circuit | 3702 | E-114 | 3 |

ATTACHMENT 5

Consumers Power Company
Big Rock Point Plant
Docket 50-155

# APPLICABLE TECHNICAL SPECIFICATIONS SECTIONS

Revised Response to Generic Letter 91-11

December 30, 1992

8 Pages

| Limiting Conditions for Operation | Surveillance Requirements |
|---|---|

11.3.5.3 EMERGENCY POWER SOURCES

Applicability:

Applies to the operational status of the emergency power sources.

Objective:

To assure the capability of the emergency power sources to provide power required for emergency equipment in the event of a Loss of Coolant Accident.

Specification:

A. For all reactor operating conditions except cold shutdown, there shall normally be available one 138 kV line, one 46 kV line, one diesel generator system, one station battery system, four RDS uninterruptible power supplies including batteries and one alternate shutdown battery system, except as specified below.

1. Refueling operations and related testing may be conducted with the 138 kV line de-energized.

2. The 46 kV line or the diesel generator may be out of service for repair for periods up to three (3) days during reactor operation and for extended periods during refueling or shutdown operations.

11.4.5.3 EMERGENCY POWER SOURCES

Applicability:

Applies to the periodic testing requirements for the emergency power sources.

Objective:

To assure the operability of the emergency power sources to provide emergency power in the event of a Loss of Coolant Accident.

Specification:

A. The emergency power system surveillance will be performed as indicated below. In addition, components on which maintenance has been performed will be tested.

1. During each operating cycle -

(a) Test of automatic initiation sensors and load test the emergency diesel to 180-200 kW generator output for at least 20 minutes.

(b) Test and calibrate the following instruments and controls associated with diesel generator:

(1) Fuel oil level.
(2) Oil Pressure tripping.
(3) Water temperature tripping.

ATTACHMENT 5
Page



Amendment No. 10, 97
May 31, 1989

## Limiting Conditions for Operation

11.3.5.3 EMERGENCY POWER SOURCES (Contd)

3. The diesel generator fuel supply shall be adequate for three-day operation.

4. If Specifications A.2 or A.3 are not met, a normal orderly shutdown shall be initiated within one (1) hour and the reactor shall be shut down as described in Section 1.2.5(a) within twelve (12) hours and shut down as described in Section 1.2.5(a) and (b) within the following 24 hours. During refueling operations cease all changes which could affect reactivity.

5. The station battery system and alternate shutdown battery system shall be operable under all conditions except during cold shutdown. If the station battery or the alternate shutdown battery is inoperable, no actions shall be taken which result in a reactivity addition, except cooldown, or which might result in the primary coolant system being drained. The alternate shutdown battery may be inoperable during refueling or shutdown operations as long as containment integrity for the main steam line is established.

6. If Specification A.3 is not met a normal orderly shutdown of the reactor shall be

## Surveillance Requirements

11.4.5.3 EMERGENCY POWER SOURCES (Contd)

(4) Overspeed tripping.

(5) Battery undervoltage alarm.

(c) Verify the automatic transfer of station power from the 138 kV line to the 46 kV line.

(d) Verify the automatic transfer of power sources for the 1Y and 2Y instrument and control panels.

(e) Verify the cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration for the station battery the RDS batteries and the alternate shutdown battery.

(f) Verify the cell-to-cell and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material for the station battery, the RDS batteries and the alternate shutdown battery.

(g) Verify that the battery charger for the station battery and the RDS batteries will suppy at least 30 amperes at a minimum of 135 volts for at least 4 hours.



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| Limiting Conditions for Operation | Surveillance Requirements |
|---|---|
| 11.3.5.3 EMERGENCY POWER SOURCES (Contd) | 11.4.5.3 EMERGENCY POWER SOURCES (Contd) |
| initiated within one (1) hour and the reactor shall be shut down as described in Section 1.2.5(a) within twelve (12) hours and shut down as described in Section 1.2.5(a) and (b) within the following 24 hours. | |
| 7. One RDS uninterruptible power supply including battery may be out of service as described in Section 3.1.5 Action 3. | |
| 8. During reactor power operation, the 138 kV line may be out of service for repair for periods up to three (3) days. | |
| 9. If Specification A.8 is not met, a normal orderly shutdown shall be initiated within one (1) hour and the reactor shall be shut down as described in Section 1.2.5(a) within twelve (12) hours and shut down as described in Section 1.2.5(a) and (b) within the following 24 hours. | |
| B. During power and refueling operations, the 2400 volt bus undervoltage components shall be operable or placed in the tripped condition, except during the monthly channel functional testing period. | (h) Verify that the capacity of the station battery, the RDS batteries and the alternate shutdown battery is adequate to supply and maintain in OPERABLE status all of the actual emergency loads for the design time interval when the battery is subjected to a battery service test. The design time interval for the RDS batteries is one hour, two hours for the station battery and seventy-two hours for the alternate shutdown battery. |
| | (i) Test and calibrate the 2400 volt bus undervoltage trip control components as follows: |
| | (1) The undervoltage relays 127-10XY, XZ and YZ will drop out on decreasing voltage of no lower than 107.1 volts, after a delay of $\leq$.6 seconds. |
| | (2) The auxiliary timing relay 162-104 will be actuated after a 10 ± 0.5 second time delay upon receiving a signal from all three (3) undervoltage relays. |



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March 16, 1990

| Limiting Conditions for Operation | Surveillance Requirements |
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11.4.5.3 EMERGENCY POWER SOURCES (Contd)

2. Monthly –

(a) Test start diesel generator and operate at least the fire pump as a load to 480 V Bus 2B for at least 20 minutes.

(b) Verify that the cell voltage is ≥2.0 volts and specific gravity is ≥1.2 of each cell of the station battery; and verify that the cell voltage is ≥6.0 volts and specific gravity is ≥1.2 on each cell of the RDS batteries; and verify that the cell voltage is ≥2.1 volts and specific gravity is ≥1.2 of each cell of the alternate shutdown battery. /

(c) Test operate the rod position motor generator set.

(d) Perform a channel functional test of the 2400 volt bus undervoltage trip system.

3. Weekly –

(a) Verify the electrolyte level of each RDS battery pilot cell, the station battery pilot cell, and the alternate shutdown battery pilot cell is between the minimum and maximum level indication marks. /



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| Limiting Conditions for Operation | Surveillance Requirements |
|---|---|
| | 11.4.5.3 EMERGENCY POWER SOURCES (Contd) |
| | (b) Verify the pilot cell specific gravity for RDS, station and alternate shutdown batteries corrected to 77°F, is ≥1.2. |
| | (c) Verify the station battery pilot cell voltage is ≥2.0 volts. The RDS battery pilot cell voltage is ≥6.0 volts and the alternate shutdown battery pilot cell voltage ≥2.1 volts. |
| | (d) Verify the overall battery voltage is ≥125 volts for the station battery the RDS batteries and the alternate shutdown battery. |
| | (e) Test start the diesel generator and run for warm-up period. |
| | (f) Verify that the diesel generator battery electrolyte level above plates and overall battery voltage is ≥24 volts. |
| | 4. Quarterly - Verify the following: |
| | (a) That the specific gravity of the diesel generator battery is appropriate for continued service. |



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|---|---|

11.4.5.3 EMERGENCY POWER SOURCES (Contd)

(b) That the diesel generator battery and battery rack show no visual indication of physical damage or abnormal deterioration; and

(c) That the diesel generator battery terminal connections are clean, tight, free of corrosion and coated with anticorrosion material.

5. Sixty months - At least once per 60 months during shutdown, verify that the RDS batteries, the alternate shutdown battery and the station battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test shall be performed subsequent to the satisfactory completion of the required battery service test of Part 11.4.5.3.A.1.(h). / /



Amendment No. 47, 97, 102
March 16, 1990

Bases:

Normal station power can be provided by the station turbine generator, the 138 kV transmission line or the 46 kV line. These sources are adequate to provide emergency a-c power. When none of these sources is available, a single emergency diesel generator rated at 200 kW starts automatically to provide emergency a-c power to 480 V Bus 2B. The weekly starting test is based on Manufacturer's Bulletin 33743-1 for relubrication protection of moving parts. Diesel generator initiation and output circuit breaker closure is accomplished by two voltage sensors: One to detect loss of normal power on Bus 2B; and, the other to provide assurance of generator output prior to automatic closure of the generator output breaker. Additional breaker interlocks are provided to assure that the normal Buses 1A and 2A are isolated prior to closing the generator output breaker. This prevents overloading of the generator during the switching period. An undervoltage trip at ≤89.25% of normal voltage isolates the 2400 volt bus prior to any postulated equipment degradation.

The operability of the diesel battery and charger is verified by the weekly starting test of the diesel and by the weekly verification of the electrolyte level and overall battery voltage.

The diesel fuel oil tank is sized for ten-day full-load operation. Three-day supply is considered adequate to provide fuel makeup.

A single station battery supplies power for normal station services and is sized for emergency uses including valves and controls of Loss of Coolant Accidents. The battery can be charged from the emergency diesel generator output if normal station power sources are not available.

The primary core spray valves and the primary containment spray valve are operated and controlled by power from the station battery. The backup core spray valves and backup containment spray valve are operated by power from normal station power sources or the emergency diesel generator.

RDS uninterruptible power supplies (UPS) A, B, C, and D (each consisting of a battery, battery charger and an inverter) supply each division (except division 5) with electrical power. Each UPS has outputs of 120 V a-c, 60 Hz, and 125 V d-c. One of these batteries supplies control power for the emergency diesel generator. Divisions 1 & 2 and 3 & 4 normally receive power from 480 V a-c Buses 1A and 2A, respectively. In the event of loss of power to either or both buses, provision is included for supplying input power from 480 V a-c Bus 2B which is tied to the emergency diesel generator. If all 480 V a-c power is lost, the RDS UPS is capable of



ℰCorrected 7/6/89

ℰAmendment No. 10, 42, 43, 51, 94
ℰFebruary 15, 1989

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Bases (Contd)

sustaining its outputs for one hour. The Station Battery has adequate capacity to supply and maintain in an operable status all of the emergency loads during a Loss of Coolant Accident plus an assumed Loss of AC Power for two hours. The station battery and the four (4) RDS batteries will be considered operable if they are essentially fully charged and the battery charger is in service. Additionally, prior to the startup following the 1977 refueling outage, successful completion of service testing and performance discharge testing within each operating cycle and each sixty months, respectively, will further establish battery reliability.

An alternate shutdown battery supplies power to the main steam isolation valve, the emergency condenser outlet valves and other alternate shutdown equipment. The battery is sized so that loss of the charger does not affect operability of the battery for up to six (6) days at a minimum of 25°F (nine (9) days at a minimum of 40°F).

ATTACHMENT 5



Amendment No. 10, 47, 61, 81, 96, 97
May 31, 1989