



Consumers  
Power  
Company

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83-04 #2

Mr J G Keppler, Regional Administrator  
US Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER PROJECT -  
DOCKET NOS 50-329 AND 50-330  
FOGG INTERLOCK RELAYS - AUXILIARY FEEDWATER SYSTEM  
FILE: 0.4.9.76 SERIAL: 23781

Reference: J W Cook letter to J G Keppler, same subject

(1) Serial 23740, dated July 22, 1983

The referenced letter provided an interim 50.55(e) report concerning DC backed power supplies for FOGG interlock relays in the auxiliary feedwater system. This letter is our final report on this subject.

Attachment 1 to this letter provides a detailed discussion of the deficiency and corrective action taken to resolve this matter. Consumers Power will notify the NRC Resident Inspectors' Office when the required wiring changes have been verified by MPQAD and have been implemented in the field.

*James W. Cook*

JWC/WRB/cd

Attachment 1: MCAR-68, Final Report, dated August 15, 1983

CC: Document Control Desk, NRC  
Washington, DC

RJCook, NRC Resident Inspector  
Midland Nuclear Plant

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PDR ADOCK 05000329  
S PDR

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Subject: MCAR 68 (issued 6/24/83)

Lack of DC backed power supplies for the FOGG interlock relays  
in the Auxiliary Feedwater System.

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#### FINAL REPORT

Date: August 15, 1983

Project: Consumers Power Company  
Midland Plant Units 1 and 2  
Bechtel Job 7220

#### INTRODUCTION

This report provides the final status and course of corrective action required pursuant to MCAR 68.

#### DESCRIPTION OF DEFICIENCY

The Midland Plant Units 1 and 2 FSAR, subsection 10.4.9.1.1, safety design basis five, requires the turbine driven APW pump to be capable of meeting the feedwater requirements for two hours upon loss of all offsite, normal onsite, and emergency onsite AC power (station blackout).

A design review of the Auxiliary Feedwater System, revealed that the FOGG interlock relays (Ref. schematic diagram E-158(Q), Rev 14, Sh 41 and 42) are powered from Class 1E AC supplies that are not DC backed, and therefore are lost during station blackout. Deenergizing the FOGG relays will cause valves 1M03177A&B and 2M03277A&B to shut, cutting off the steam supply to the Auxiliary Feedwater Turbine.

#### SUMMARY OF INVESTIGATION AND HISTORICAL BACKGROUND

This deficiency was discovered during the Midland independent design and construction verification program.

#### ANALYSIS OF SAFETY IMPLICATIONS

A complete loss of AC power would cause inoperability of the steam supply isolation valves and would result in loss of feedwater to the steam generators and the inability to safely cool down the reactor coolant system during a station blackout.

#### PROBABLE CAUSE

Valves 1M03177A&B and 2M03277A&B were supplied from Class 1E DC power as required by logic diagram J-234(Q), Rev 5, for operation during station blackout.

When designing the FOGG interlock relay circuits, power supplies equivalent to those required for the above valves should have been used. The root cause was determined to be a unique instance where the need for the DC backed power was omitted in the detailed design.

CORRECTIVE ACTION

1. Schematic diagram E-158(Q) and associated connection and panel drawings have been revised and issued as of July 27, 1983, to provide the FOGG interlock relay circuit with Class 1E DC backed 120V AC power.
2. Engineering has reviewed all safety related systems to ensure that interlocks for valves and prime movers requiring Class 1E DC backed power are supplied from the appropriate power supplies in accordance with the FSAR and system requirements. Refer to the attached for a listing of valves/prime movers reviewed. The review showed that power supplies to all valve interlocks were in accordance with FSAR and system design requirements.
3. Engineers preparing schematic diagrams in the future have been formally instructed to include in their checklist verification that appropriate power supplies are used in accordance with FSAR and system design requirement for individual components and any required interlocks.

REPORTABILITY

Based on the safety implications this deficiency was reported to the NRC in accordance with Title 10 of the Code of Federal Regulation Part 50.55(e) on June 22, 1983.

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Attachment: List of Valves/Prime Movers Reviewed (2 pages)

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LIST OF VALVES/PRIME MOVERS REVIEWED

125V DC VALVES

<u>DC PNL #</u>	<u>BKR #</u>	<u>Valve #</u>	<u>DWG #</u>	<u>Page #</u>	<u>Description</u>
1D11	14	1MO-3865A	E-158(Q)	1	AFW Isolation VLV A
1D21	16	1MO-3865B	E-158(Q)	3	AFW Isolation VLV B
1D21	14	1MO-3177A	E-158(Q)	24	Stm Gen 1E-51A/B Crosscon
1D21	15	1MO-3177B	E-158(Q)	25	Stm Gen 1E-51A/B Crosscon
1D12	15	1XV-3889	E-158(Q)	49	AFW Sys VLV
1D11	11	1XV-3111A	E-352(Q)	9, 12	MSLIV
1D21	11	1XV-3111B	E-352(Q)	9, 12	MSLIV
1D21	17	1MO-3831	E-153(Q)	1	AFWPT 1G-05 Trip & Throttle VLV
1D12	14	1SV-0102	E-223(Q)	2	RC PRE PORV
2D11	11	2XV-3211A	E-352(Q)	9, 12	MSLIV
2D11	14	2M03965A	E-158(Q)	3	STM GEN 2E-51A AFW Inlet
2D21	11	2XV-3211B	E-352(Q)	9, 12	MSLIV
2D21	14	2M03277A	E-158(Q)	25	STM GEN 2E-51A Outlet to AFW
2D21	15	2M03277B	E-158(Q)	25	STM GEN 2E-51A Outlet to AFW
2D21	16	2M03965B	E-158(Q)	3	STM GEN 2E-51B AFW Inlet
2D12	15	2XV-3989	E-158(Q)	49	AFW SYS VLV
2D12	14	2SV-0202	E-223(Q)	3	RC PRESS PORV
2D21	17	2M03931	E-153(Q)	6	AFWPT 2P-05B Trip & Throttle VLV

NOTE: No prime movers with interlocks requiring Class 1E DC backed power were found.

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120V AC PREFERRED POWER VALVES

<u>AC PNL #</u>	<u>BKR #</u>	<u>Valve #</u>	<u>DWG #</u>	<u>Page #</u>	<u>Description</u>
1Y11	02	1LV-3875A1	E-158(Q)	54	STM GEN APW LVL Control Valve
2Y11	02	2LV-3975A1	E-158(Q)	55	STM GEN APW LVL Control Valve
1Y11	02	1LV-3875A2	E-158(Q)	56	STM GEN APW LVL Control Valve
2Y11	02	2LV-3975A2	E-158(Q)	57	STM GEN APW LVL Control Valve
1Y12	02	1LV-3875B1	E-158(Q)	58	STM GEN APW LVL Control Valve
1Y12	02	1LV-3875B2	E-158(Q)	59	STM GEN APW LVL Control Valve
2Y12	02	2LV-3975B2	E-158(Q)	59	STM GEN APW LVL Control Valve
2Y12	02	2LV-3975B1	E-158(Q)	59	STM GEN APW LVL Control Valve
1Y11	02	1XV-3111A	E-352(Q)	1	MSLI Valve
1Y12	02	1XV-3111B	E-352(Q)	5	MSLI Valve
2Y11	02	2XV-3211A	E-352(Q)	5	MSLI Valve
2Y12	02	2XV-3211B	E-352(Q)	5	MSLI Valve
1Y11	02	1SV-1023A	E-253(Q)	11	DHRS Dump to Sump Valve
1Y11	02	1SV-1023B	E-253(Q)	11	DHRS Dump to Sump Valve
1Y12	02	1SV-1023C	E-253(Q)	11	DHRS Dump to Sump Valve
1Y12	02	1SV-1023D	E-253(Q)	11	DHRS Dump to Sump Valve
2Y11	02	2SV-1123A	E-253(Q)	11	DHRS Dump to Sump Valve
2Y11	02	2SV-1123B	E-253(Q)	11	DHRS Dump to Sump Valve
2Y12	02	2SV-1123C	E-253(Q)	11	DHRS Dump to Sump Valve
2Y12	02	2SV-1123D	E-253(Q)	11	DHRS Dump to Sump Valve

NOTE: No prime movers with interlocks requiring Class 1E DC backed power were found.