Consumers Power
POWERING MICHIGAN'S PROGRESS
Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

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U.S. Nuclear Regulatory Commission
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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT
RESPONSE TO NOTICE OF VIOLATION FOR TWO VIOLATIONS IN NRC INTEGRATED INSPECTION REPORT NO. 50-255/96014(DRP)

NRC Inspection Report No. 50-255/96014(DRP) dated January 22, 1997, identified two Severity Level IV Violations of NRC requirements. The first violation identified two examples where the plant staff did not adhere to procedures while performing outage related activities. The second violation identified an example where adequate installation instructions were not provided for a temporary modification to the containment polar crane. Our response to these violations is in Attachment 1.

Consumers Power Company (CPCo) agrees to the violations as stated.

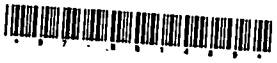
SUMMARY OF COMMITMENTS

This letter contains three new commitments and no revisions to existing commitments.

1. Periodic activity, SPS050, will be revised to use the terminology of operating procedure, SOP 30, and to make the steps to align automatic transfer switch, Y50, an Operations responsibility with the appropriate sign offs.

2. A review of all installed temporary modifications will be conducted to verify that acceptable standards were used for installation.

IE01



3. The Temporary Modification process will be reviewed to assure that adequate guidance is provided to the design engineer for providing installation instructions, and for verifying that the temporary modification was installed as intended by the design.

Thomas J. Palmisano
Plant General Manager

CC Administrator, Region III, USNRC
Project Manager, NRR, USNRC
NRC Resident Inspector - Palisades

Attachment

ATTACHMENT 1

CONSUMERS POWER COMPANY
PALISADES PLANT
DOCKET 50-255

RESPONSE TO TWO VIOLATIONS FROM NRC INSPECTION REPORT NO. 50-255/96014 (DRP) DATED JANUARY 22, 1997

10 Pages

RESPONSE TO NOTICE OF VIOLATION
FROM NRC INSPECTION REPORT NO. 50-255/96014(DRP)

NRC VIOLATION

1.) *10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.*

a. *Licensee procedure CPAL-RFM-002, Revision 0, Section 9.2.11, "Uncouple CRDMs and Raise Rack Extensions," required in step C.4 that all CRDMs be mechanically locked prior to inserting a reactor trip into the reactor protection system.*

b. *Work Order No. 24610226 and PPAC No. SPS050, "PM Auto Transfer Switch," Step 11, required that operations return the isolation handle to normal position prior to performing step 12, which required that operations return the bypass handle to automatic.*

Contrary to the above,

a. *On November 7, 1996, the operations shift did not ensure that the control rod drive mechanisms were mechanically locked prior to inserting a reactor trip signal, resulting in the CRDM racks dropping into the reactor vessel upper guide structure.*

b. *On November 17, 1996, the operations shift did not return the isolation handle to the normal position prior to returning the bypass handle to automatic position, resulting in a loss of power to instrument AC bus Y-01.*

This is a Severity Level IV violation (Supplement I).

CONSUMERS POWER COMPANY RESPONSE

Consumers Power Company (CPCo) agrees with the violation as stated.

REASON FOR VIOLATION

Event 1a.

Several factors contributed to this event. First, the "C" shift Control Room Supervisor and the Control Operator were not fully knowledgeable about the status of the control rod drive mechanisms. Second, the shift turnover between "B" shift and "C" shift was inadequate in that it failed to identify the controlling procedure and it failed to discuss the need to contact Refueling Services after Electrical maintenance was completed with CRD #33. Third, the Control Room Supervisor and the Control Operator failed to question the need for a procedure and determine which procedure was governing the evolution.

Discussion

On November 7, 1996, preparations were being made to remove the reactor vessel head. These preparations require

1) The uncoupling of the control rods from their drive mechanisms.
2) Raising the control rod drive racks
3) Mechanically locking the control rod drive racks
4) De-energizing the control rod drive motors, clutches, and brakes by placing the reactor protection system in the "reactor trip" mode.

On "A" shift, the Refueling Services personnel began to uncouple the control rod drives. About 1300 on "B" shift, the Refueling Services Supervisor called the Control Room to let the Control Room know the uncoupling was completed and Operations was requested to raise the control rod drive racks. At this time, Operations discussed the status of the uncoupling with Refueling Services and understood that the Refueling Services procedure was controlling. Operations then withdrew forty-four of the forty-five control rod drive racks, but problems were encountered with CRD #33 rack. Electrical maintenance personnel assistance was requested. While the plant electricians were repairing CRD #33, Operations turnover between "B" and "C" shifts occurred. During this turnover, general information concerning the control rods was exchanged, but it was not established that the Refueling Services procedure was controlling. "C" shift Operations personnel did not understand that the Refueling Services procedure was controlling the evolution and that Refueling Services required notification to lock the control rod drive racks after CRD#33 rack was withdrawn.

On "C" shift the electricians finished repairing CRD #33, withdrew the control rod drive rack and mechanically locked it in place. The Shift Supervisor, upon being notified that CRD #33 problem had been resolved and the control rod drive rack was mechanically locked, thought the next sequential step to be performed was to place the reactor protective system in the "reactor trip" mode. The Shift Supervisor did not verify the status of the control rod drive racks nor did he determine which procedure was controlling the evolution and verify that the prerequisites were met. The Shift Supervisor directed Control Room personnel to place the reactor protection system in the "reactor trip" mode. Control Room personnel observed all control rod drive racks, except CRD #33 rack, reinserting into the reactor vessel upon the reactor protection system trip initiation. Subsequently, it was recognized that the control rod racks had not been mechanically locked when control rod #33 rack problem was encountered. The Refueling Services procedure allowed the control rod drive racks to be locked after all the racks were withdrawn.

Event 1b.

The reasons for this event included inadequate understanding of the work scope, inadequate communications, inadequate work control documents and improper equipment operation.

Discussion

On November 17, 1996, the plant was in refueling shutdown conditions with shutdown cooling system in operation. The instrument AC Bus, Y01, was being supplied from Motor Control Center 1. Y01 is critical to the operation of the shutdown cooling system as it affects shutdown cooling heat exchanger bypass and discharge valves (CV-3006 and CV-3025). Earlier in the day these valves were placed on their manual hand jacks to maintain their position as instrument air was isolated and tagged for another maintenance activity.

An electrical preventative maintenance activity (PPAC) was scheduled for the Y01 automatic transfer switch, Y50. This required the Y50 switch to be removed from service so electrical maintenance personnel could remove the switch from the cabinet and take it to the electrical shop to perform the preventative maintenance.

Control Room personnel reviewed the activity but focused on the impact of this activity on the operation of the shutdown cooling system. They determined that the shutdown cooling heat exchanger bypass and discharge valves would not be affected as they were manually being operated by the valves' hand jacks. The outage schedule stated that Operations was to "Manually align Y01 to its normal supply". However, because all the PPAC steps were assigned to Electrical Maintenance for completion, Operations

did not obtain a copy of the procedure to review, and failed to establish the full electrical maintenance work scope. Subsequently, Operations decided to implement a portion of SOP 30 that configured the Y50 switch from automatic to normal, but did not recognize the need to place the isolation handle to "open" (see attached sketch). This configuration fulfilled only one of two alignment steps specified in the PPAC.

The Control Room Supervisor (CRS) directed an Auxiliary Operator (AO) to configure Y01 onto its normal supply using SOP 30. The AO accompanied by the System Engineering Test Coordinator (SETC) performed the alignment. The SETC explained to the AO that not only would Y01 have to be placed on its normal power supply but, also, Y50 must be isolated by moving the isolation handle to the "open" position. At this point the AO should have contacted the CRS for direction and permission to perform the isolation. However, the AO did the isolation and then communicated the completion of the activity and the additional step taken to the Nuclear Control Operator (NCO). The NCO understood this message to mean that the activity was completed as directed by the CRS. Therefore, the CRS was not informed that Y50 was isolated.

After the electrical maintenance activity was completed, the Electrician informed the Work Control Center Lead SRO that maintenance was completed and that the Electrician needed to be present when Operations restored the switch in order to sign the work order steps. Also, the SETC contacted the Work Control Center and requested that he be notified prior to the restoration activity; however, neither were contacted. If either the Electrician or the SETC had been at the work site during restoration, or if the work activity been written to have Operations sign off for the restoration, Operations would have understood the desired position of Y50.

Work Control Center notified the Shift Lead SRO that Y50 could be restored. The Shift Lead SRO conferred with the CRS on restoring Y50, and they decided to proceed. The CRS assigned a different AO to restore Y50, informed the AO and Shift Lead SRO of the steps he had directed the previous AO to perform, and identified the steps of SOP 30 required to restore Y50.

The Shift Lead SRO and the AO went to perform the alignment of Y50. They observed the isolation handle, the source light indication and the switch's physical position, but they did not recognize their indications were different than expected. The AO placed the Y50 bypass handle from normal to automatic. Because the isolation handle had not been restored to the "close" position, Y50 failed to transfer and Y01 was de-energized.

CORRECTIVE ACTIONS TAKEN AND RESULTS ACHIEVED

The following actions were taken.

Event 1a.

1. Refueling and Maintenance outage activities were temporarily suspended on November 18, 1996 to review and reinforce nuclear, radiation, and industrial/personnel safety concerns with all work groups on site. This event and several other events from the first two weeks of the outage were reviewed with all crews. A common theme running among the identified issues is the lack of communications between work groups and alignment among workers.

2. Three specific responsibilities were reinforced at the Operations Department stand down meetings. These were:

   - Shift Supervisors, are to identify Operations activities from the outage schedule with an understanding of the relationship between these activities and others. It is intended that this understanding will contribute to well-informed decision making within the Operations organization.

   - Work Control Center Senior Reactor Operators are to direct work activities having Operations involvement to Control Room personnel for authorization. This is to provide interfacing work documents physically to the individuals who will be performing the activity, better communications between Operations and other work discipline personnel, and improve the information flow to those individuals who will be directing the activity.

   - Control Room personnel are to assure they have a complete understanding of activities requested of them and that proper alignments have been made.

3. The control rod drive blades and racks were inspected for damage due the trip occurring with a reduced water level. No damage was observed on any of the control rod drive blades or racks.

Event 1b.

In addition to actions 1 and 2 from above, the following actions were taken.

1. Shift Supervisor, CRS, Lead SRO, AO and other Operations personnel involved discussed this event and the barriers that could have prevented it. The

discussion included responsibilities for proper communications, pre-job briefings, equipment operation, self checking and other aspects of operator conduct.

2. Shift Operations Supervisor has briefed the Shift Supervisors and SROs on the need to identify and conduct pre-job briefings. The expectation to conduct pre-job briefings whenever coordination between two or more work groups is required has been re-established.

3. Maintenance and Construction Manager reinforced pre-job briefing expectations with maintenance and construction supervision personnel using this event as an example where a collective pre-job briefing may have prevented the event.

CORRECTIVE ACTIONS REMAINING TO BE TAKEN TO AVOID FURTHER VIOLATIONS

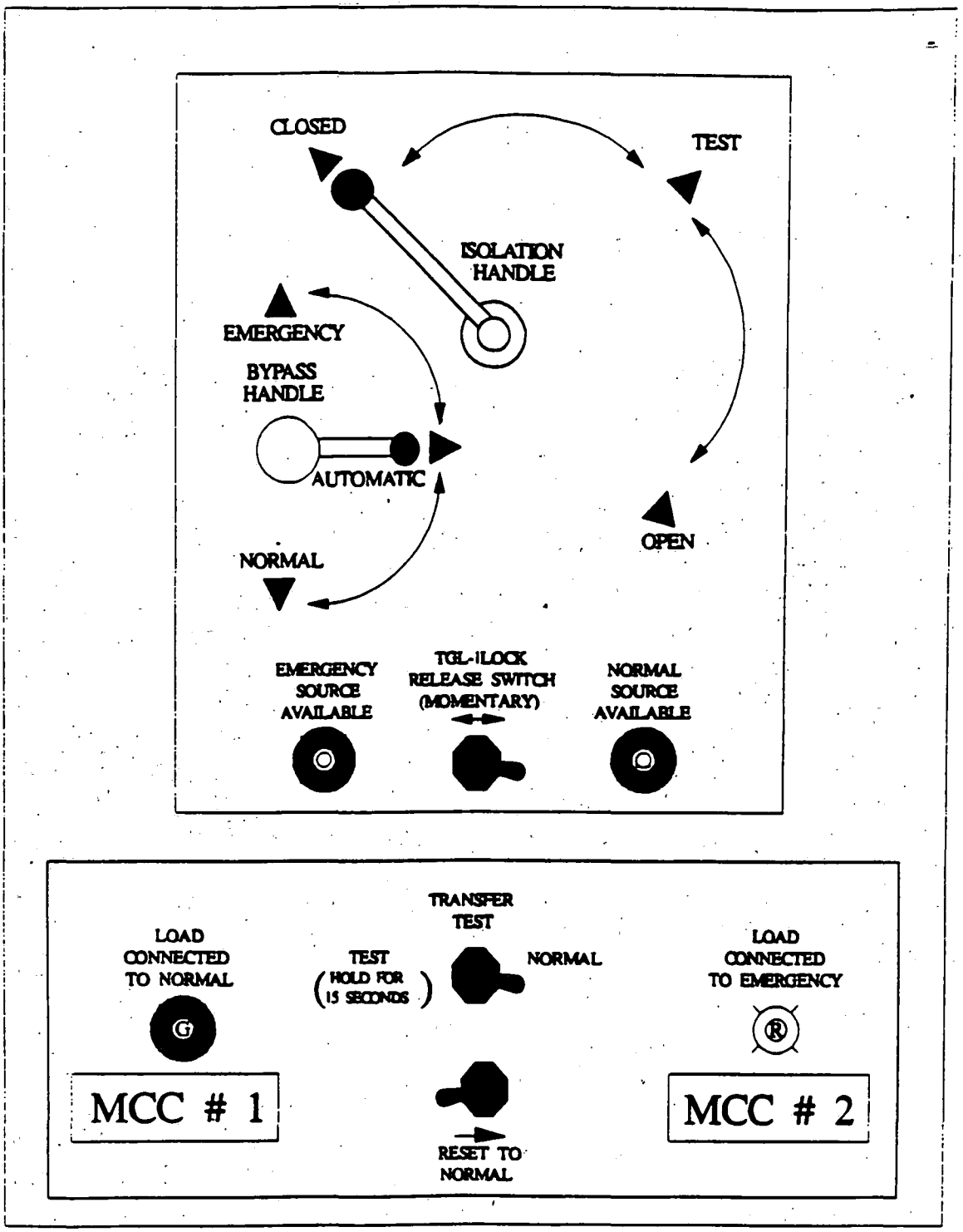
Periodic activity, SPS050, will be revised to use the terminology of operating procedure, SOP 30, and to make the steps to align automatic transfer switch, Y50, an Operations responsibility with the appropriate sign offs.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

CPCo is now in full compliance.

Y-50

AUTOMATIC TRANSFER SWITCH



NRC VIOLATION

2.) *10 CFR 50, Appendix B, Criterion III, Design Control, requires, in part, that design control measures "...shall include provisions to assure that appropriate quality standards are specified and included in design documents...," and that "...design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of...design reviews. Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design..."*

Palisades Administrative Procedure 9.31, "Temporary Modification Control," Revision 12, Paragraph 7.1.8, required that a technical review be conducted to verify that instructions for installation were correct.

Contrary to the above,

On November 6, 1996, Temporary Modification (TM) 96-050 to the containment polar carne did not contain correct installation instructions for replacement of a single solenoid with two solenoids. The original solenoid was hard mounted and was provided with adequate ventilation to prevent premature failure. As the result of inadequate preparation and review, TM 96-050 did not provide instructions for mounting the second of the two replacement solenoids. The second solenoid was installed utilizing duct tape and "tie-wraps" in a manner which resulted in overheating and failure of the solenoid coil, and a subsequent electrical fire.

This is a Severity Level IV violation (Supplement 1).

CONSUMERS POWER COMPANY RESPONSE

Consumers Power Company (CPCo) agrees with the violation as stated.

REASON FOR THE VIOLATION

Based on the inspection data from the failed coils, the most likely cause of the failure on the trolley crane brake coils is the manner which the coils were mounted. This inadequate mounting design was caused by the failure of design personnel to identify solenoid heat dissipation as critical characteristic during the design process.

Discussion

A temporary modification was required to the containment Polar Crane due to a failure of the existing 460VAC solenoid on the trolley brake actuator. No replacement 460VAC solenoid was available. When this solenoid is energized, the actuator releases the braking mechanism on the crane trolley motor.

The modification involved the replacement of the original 460VAC coil with two 230VAC coils. One of the 230V coils would be installed in the position of the original coil and the second would be used as a dummy load to provide a voltage drop across it. This would result in a voltage dividing circuit which would divide the 460 volts from the circuit supply in half thus applying 230 volts across each coil. To ensure that the impedance was matched a spare plunger was inserted into the dummy coil and fixed in the inserted position using duct tape. The dummy coil was then tye-wrapped to a support bar and additional tape was wrapped around it.

The temporary modification to substitute the 230VAC coils for the 460VAC was an acceptable design. However, the dummy coil mounting design was focused on making sure the coil did not come loose and fall into the debris free zone inside containment. Potential overheating of the dummy coil was not considered in the design.

The Polar Crane was in service with the temporary modification in place for approximately 60 hours before failure occurred. With high usage of the Polar Crane and repeated starts and stops on the trolley crane motor, the additional layers of tape on the dummy coil caused chronic overheating of the dummy coil. The epoxy insulating material became hot enough to melt and the dummy coil wires shorted together. This allowed the full 460 volts to be applied across the 230VAC working coil, causing its failure. The smoke and arcing observed was the result of the dummy coil overheating, causing the duct tape to catch fire and burn. No evidence of arcing to the support structure was found around either coil.

CORRECTIVE ACTIONS TAKEN AND RESULTS ACHIEVED

1. The two 230 volt coils were replaced with a new 460 volt coil. It has been in use without incident since it was installed.

2. This event was reviewed as a lessons learned with all Design Engineering at a department stand down meeting. Discussions covered conditions leading to the event, and the need for Design Engineering to consider all operating characteristics in design.

CORRECTIVE ACTIONS REMAINING TO BE TAKEN TO AVOID FURTHER VIOLATIONS

1. A review of all installed temporary modifications will be conducted to verify that acceptable standards were used for installation.

2. The Temporary Modification process will be reviewed to assure that adequate guidance is provided to the design engineer for providing installation instructions, and for verifying that the temporary modification was installed as intended by the design.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

CPCo is in full compliance.