FORM 5326

INDIANA & MICHIGAN ELECTRIC COMPANY
DONALD C. COOK NUCLEAR PLANT

MAINTENANCE DEPARTMENT
CONTROLLED DOCUMENT
COPY NO. _____

PROCEDURE COVER SHEET

Procedure No. **1MHP2140.082.003
Revision No. 0

TITLE MAINTENANCE PROCEDURE FOR REPOWERING PRESSURIZER BACKUP HEATERS

SCOPE OF REVISION

SIGNATURES	PEVISION NUMBER			
* * * * * *	ORIGINAL			
PREPARED BY				
DEPARTMENT HEAD APPROVAL				
INTERFACING DEPARTMENT HEAD CONCURRENCE	N/A			
QUALITY ASSURANCE SUPERVISOR APPROVAL				
PLANT NUCLEAR SAFETY COMMITTEE				
PLANT MANAGER APPROVAL				
APPROVAL DATE	5/22/86			
EFFECTIVE DATE	5/29/86			

LIST OF EFFECTIVE PAGES

PAGE NUMBER	REVISION NUMBER/EFFECTIVE CHANGES
1 of 7	Revision 0
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DONALD C. COOK NUCLEAR PLANT
INDIANA & MICHIGAN ELECTRIC COMPANY

1.0 TITLE: Maintenance Procedure for Repowering Pressurizer Backup Heaters

2.0 OBJECTIVE:

2.1 This procedure provides instructions for the installation of a temporary power feed to an inoperative Unit 1 pressurizer heater backup group from a Unit 2 power source. It is intended for use when the power and/or control cables for the backup heater groups have been fire damaged resulting in a loss of operability of the pressurizer backup heater groups.

3.0 REFERENCES:

3.1 Equipment Control-Clearance Permit System, PMI-2110.

3.2 Plant Safety Manual, General Safety G.9.

3.3 Maintenance Procedure 12MHP5021.082.006.

3.4 Maintenance Procedure **MHP5022.082.002.

3.5 10CFR50, Appendix R, Section III, L.5.

3.6 Control of Special Tools and Measuring and Test Equipment, MHI-5060.

3.7 Donald C. Cook Technical Specification 3.4.4.

4.0 PRECAUTIONS

4.1 Calibrated tools or measuring and test equipment shall not be used in a manner that would invalidate its calibration.

5.0 LIMITATIONS

5.1 Subsections and steps within Section 7.0 shall be accomplished in the sequence shown, unless specified otherwise in the body of the procedure.

5.2 The Maintenance Supervisor assigned the work is responsible for ensuring that the controlled copy of this procedure is the latest revision and includes all applicable approved change sheets.

5.3 The Maintenance Supervisor assigned the work is responsible for ensuring that the controlled copy of this procedure is maintained at the work site, if not in a radiological controlled area, and that required data is entered in the controlled copy. If the work to be performed is in a radiological controlled area, the controlled copy shall be maintained in the Supervisor's office and a controlled working copy shall be available at the job site.

NOTE: When a controlled working copy is being used at the work site, data should be entered as best as practical.

5.4 The Maintenance Supervisor assigned the work is responsible for initialing all steps which are performed out of sequence. All steps which will not be performed based on the scope of work, will be indicated by "N/A" in the appropriate sign off blank, and initialed by the Supervisor with a brief explanation of why the step was not performed.

5.5 Attachments No. 3 or 4 must be completed for Lifted Leads or Electrical Jumpers, per PMI-2140. Multiple copies of these attachments may be used.

5.6 Steps in the procedure which require a verification by the Maint. Supv. may be performed by a qualified individual designated by the Supervisor; Provided that individual is independent of the work being performed.

5.7 It is assumed that the equipment required by this procedure is available. Additionally, use of equipment required from the opposite (unaffected) unit should not impair safe continued operation or shutdown of that unit.

6.0 INITIAL CONDITIONS

6.1	Maint. Mech.	Enter backup heater bundle(s) to be repowered. _____ _____ _____
6.2	Maint. Supv./ Production Control	Enter Job Order Number. _____ J.O. #
6.3	Maint. Mech.	Necessary tools and equipment which require periodic calibration must be checked to ensure that they have been calibrated within the specified time interval.

6.4	Maint. Supv.	Verify that all parts which are known to be required are available prior to starting the work. Refer to Attachment No. 1 for listing of required material.
6.5	Maint. Mech.	Obtain Shift Supervisor approval to start the work.

S.S. _____ Date _____

Verified By _____ Date _____

7.0 DETAILS

7.1 DETERMINATING EACH AFFECTED POWER CABLE

7.1.1	Maint. Mech.	Verify the breaker for the Unit 1 heater group has been racked out, tagged, and the heaters are de-energized. See Attachment No. 2 for appropriate MCC's and breakers.
7.1.2	Maint. Mech.	Verify grounds are installed on the power cable. Disconnect the cable at the containment penetration. (See Attachment No. 2 for penetration and cable numbers.) Apply Temporary Modification I.D. Tags. Enter data and sign-off on Attachment No. 3.
7.1.3	Maint. Supv.	Verify the cable has been properly disconnected at the containment penetration. Sign-off on Attachment No. 3.
7.1.4	Maint. Mech.	Megger the heater bundles per applicable sections of **MHP5022.082.002. If a heater bundle fails the megger, contact the S.S. and determine which heater bundle will be used.

Megger Serial No. _____ Calib. Date/Due Date _____

7.2 TERMINATING TEMPORARY POWER CABLE

NOTE: Temporary power for the backup heaters is obtained from MCC 1-PHC-4, which is located in the U-1 reactor cable tunnel. Power is fed to the MCC from breaker 21-PHC-4. Three (3) three (3)-conductor cables are terminated at MCC 1-PHC-4, and are to be used for the temporary power supply.

7.2.1	Maint. Mech.	Verify the breaker (21PHC4) for the temporary power supply has been racked out, tagged, and the MCC is de-energized.
7.2.2	Maint. Mech.	Verify grounds are installed on the emergency power feed from the breaker. Route the temporary power cable(s) from MCC 1-PHC-4 to the appropriate containment penetration.
7.2.3	Maint. Mech.	Terminate the temporary power cable(s) at the penetration using appropriate sections of Maintenance Procedure 12MHP5021.082.006. Apply Temporary Modification I.D. Tags. Enter data and sign-off on Attachment No. 4.
7.2.4	Maint. Supv.	Verify the temporary power cables are properly terminated and grounds have been removed. Sign-off on Attachment No. 4.
7.2.5	Maint. Mech.	Notify the Control Room/Shift Supervisor that the temporary power supply to the backup heaters is installed.

_____ _____
Performed By Date

_____ _____
S.S. Date

8.0 RESTORATION

8.1 TEMPORARY POWER SUPPLY

8.1.1	Maint. Mech.	Verify breaker 21-PHC-4 has been racked out and tagged, and the backup heaters are de-energized.

8.1.2	Maint. Mech.	Verify grounds are installed on the temporary breaker. Determinate the cable at the containment penetration and return the cable to its storage location near MCC 1-PHC-4. Remove Temporary Modification I.D. Tags. Sign-off Attachment No. 4.
8.1.3	Maint. Supv.	Verify temporary cables have been de-terminated and returned to the storage rack and I.D. tags are removed. Sign-off on Attachment No. 4.

8.2 PERMANENT POWER SUPPLY

8.2.1	Maint. Mech.	Verify the appropriate breaker(s) is/are racked out and tagged and the heaters are de-energized.
8.2.2	Maint. Mech.	Verify grounds have been installed on the breaker(s).
8.2.3	Maint. Mech.	Perform a visual inspection of the power feeds to the heaters. If any damage is noted, proceed directly to Step 8.2.5 Observations_____ _____ _____
8.2.4	Maint. Mech.	Perform a megger on the power cables using applicable sections of **MHP5022.082.002. If the megger is unacceptable, contact Maint. Supv. for resolution. If the megger is acceptable, proceed directly to Step 8.2.8. _____ _____ Megger Serial No. Calib. Date/Due Date
8.2.5	Maint. Mech.	Remove the damaged cable and pull new cable per Maintenance Procedure **12MHP5021.082.004.
8.2.6	Maint. Mech.	Install lugs on the new cable per Maintenance Procedure 12MHP5021.082.006.

8.2.7	Maint. Mech.	Perform a megger on the new cable using the applicable sections of **MHP5022.082.002.

Megger Serial No. _____ Calib. Date/Due Date _____

8.2.8	Maint. Mech.	Terminate the cable at the containment penetration, the MCC, and the breaker as required, per Maintenance Procedure 12MHP5021.082.006. Remove Temporary Modification I.D. Tags. Complete and sign-off Attachment No. 3.
8.2.9	Maint. Supv.	Verify the power feeds are restored and temporary I.D. tags have been removed if the existing cable was re-used. Sign-off on Attachments No. 3.
8.2.10	Maint. Supv.	Verify all electrical jumpers have been removed, all lifted leads have been re-terminated, and all Temporary Modification I.D. tags have been removed. Signoff on Attachments No. 3 and No. 4.
8.2.11	Maint. Mech.	Notify the Shift Supervisor and Unit Supervisor the backup heaters are functional.

Performed By _____ Date _____

S.S. _____ Date _____

8.3 RETURN TEMPORARY POWER SUPPLY MATERIALS TO STORAGE

8.3.1	Maint. Mech.	Return all tools and materials used for the temporary power supply to their storage location.
8.3.2	Maint. Supv.	Verify all tools and materials are in the proper storage location.

9.0 ACCEPTANCE CRITERIA

9.1 Installation of the temporary power supply to the U-1 pressurizer backup heaters shall be considered acceptable provided work is completed per this procedure and the pressurizer backup heaters are functional.

9.2 Final acceptance shall be achieved upon restoration of a normal power supply to the U-1 pressurizer backup heaters.

9.3 In the event that jumpers are not removed and/or lifted leads are not restored, a PNSRC evaluation shall be performed and the signoff completed on the appropriate attachment(s).

10.0 DATA COLLECTION

10.1	Maint. Supv.	Review entire procedure for completeness.	
		_____ Maint. Supv.	_____ Date
10.2	Maint. Supt.	Review of entire procedure.	
		_____ Maint. Supt.	_____ Date

TOOLS AND HARDWARE

Knife

Dykes

Emery Paper

Butt Sleeve

Crimper

Heat Shrink

Heat Gun

Extension Cord

Lights

BACKUP HEATER GROUP	BREAKER	MCC	PENETRATION	HEATER BUNDLE	CABLE
1-A1	11-PHA-2	1-PHA-1	1-1P1	13, 14, 37 (A1A)	1403 PR-1
				17, 18, 42 (A1B)	1404 PR-1
			1-4P2	33, 61, 62 (A1C)	1414 PR-1
				38, 67, 68 (A1D)	1415 PR-1
				43, 73, 74 (A1E)	1416 PR-1
1-A2	11-PHA-3	1-PHA-2	1-1P1	1, 2, 22 (A2A)	1400 PR-1
				5, 6, 27 (A2B)	1401 PR-1
				9, 10, 32 (A2C)	1402 PR-1
1-A3	11-PHA-4	1-PHA-3	1-4P2	23, 49, 50 (A3A)	1412 PR-1
				28, 55, 56 (A3B)	1413 PR-1
1-C1	11-PHC-2	1-PHC-1	1-2P2	3, 4, 25 (C1A)	1435 PG-1
				7, 8, 30 (C1B)	1436 PG-1
				11, 12, 35 (C1C)	1437 PG-1
				15, 16, 40 (C1D)	1438 PG-1
				19, 20, 45 (C1E)	1439 PG-1
1-C2	11-PHC-3	1-PHC-2	1-3P1	24, 51, 52 (C2A)	1456 PG-1
				29, 57, 58 (C2B)	1457 PG-1
				34, 63, 64 (C2C)	1458 PG-1
1-C3	11-PHC-5	1-PHC-3	1-3P1	39, 69, 70 (C3A)	1459 PG-1
				44, 75, 76 (C3B)	1460 PG-1

LIFTED WIRE FORM

MAINTENANCE DEPARTMENT
CONTROLLED DOCUMENT
COPY NO. _____

UNIT 1
LOCATION Reactor Cable Tunnel
EQUIPMENT AFFECTED Pressurizer Backup Heaters
7.1.2
8.2.8

ITEM#	TERM. BLOCK & TERMINAL #	CABLE #/COMPONENT DESCRIPTION	LIFTED BY	LIFTED DATE	LANDED BY	LANDED DATE

7.1.3 THE ABOVE WIRES HAVE BEEN CORRECTLY LIFTED.
ITEM # _____ VERIFIED BY _____ DATE _____

8.2.9 PARTIAL RESTORATION: THE FOLLOWING WIRES HAVE BEEN RESTORED TO DESIGN CONFIGURATION.

ITEM # _____ VERIFIED BY _____ DATE _____

8.2.10 FINAL RESTORATION: ALL WIRES WHICH WERE LIFTED HAVE BEEN RESTORED TO DESIGN CONFIGURATION AND ALL TAGS HAVE BEEN REMOVED.

VERIFIED BY _____ DATE _____

PNSRC REVIEW: NOT ALL THE LIFTED WIRES HAVE BEEN RESTORED AND A 10 CFR 50.59 SAFETY EVALUATION HAS BEEN PERFORMED AND APPROVED BY THE PNSRC PER PMI-1040.

PNSRC REVIEW BY _____ PNSRC MTG _____ DATE _____

IF RESTORED, ATTACH THIS FORM TO THE PROCEDURE OR JOB ORDER.. IF NOT, PLACE THIS FORM IN CONTROL ROOM BOOK.

ELECTRICAL JUMPER FORM

MAINTENANCE DEPARTMENT CONTROLLED DOCUMENT.
COPY NO. _____

UNIT 1
LOCATION Reactor Cable Tunnel
EQUIPMENT AFFECTED Pressurizer Backup Heaters
7.2.3
8.1.2

ITEM #	JUMPER FROM TERMINAL # AND/OR CONTACT LOCATION	JUMPER TO TERMINAL # AND/OR CONTACT LOCATION	INSTALLED BY	INSTALLED DATE	REMOVED BY	REMOVED DATE

7.2.4 THE ABOVE JUMPERS HAVE BEEN CORRECTLY INSTALLED.
ITEM # _____ VERIFIED BY _____ DATE _____

8.1.3 PARTIAL RESTORATION: THE FOLLOWING JUMPERS HAVE BEEN REMOVED AND THE CIRCUIT RESTORED TO DESIGN CONFIGURATION.

ITEM # _____ VERIFIED BY _____ DATE _____

8.2.10 FINAL RESTORATION: ALL JUMPERS WHICH WERE INSTALLED AND ALL TAGS HAVE BEEN REMOVED AND THE CIRCUIT RESTORED TO DESIGN CONFIGURATION.

VERIFIED BY _____ DATE _____

PNSRC REVIEW: NOT ALL THE JUMPERS HAVE BEEN REMOVED AND A 10 CFR 50.59 SAFETY EVALUATION HAS BEEN PERFORMED AND APPROVED BY THE PNSRC PER PMI-1040.

PNSRC REVIEW BY _____ PNSRC MTG _____ DATE _____

IF RESTORED, ATTACH THIS FORM TO THE PROCEDURE OR JOB ORDER. IF NOT, PLACE THIS FORM IN CONTROL ROOM BOOK.