DMB
IN 82-03

American Electric Power Service Corporation
D. C. Cook 1, 2 (50-315, 50-316)

Cincinnati Gas and Electric Company
Zimmer (50-358)

The Cleveland Electric Illuminating Company
Perry 1, 2 (50-440, 50-441)

Commonwealth Edison Company
Braidwood 1, 2 (50-456, 50-457)
Byron 1, 2 (50-454, 50-455)
Dresden 1, 2, 3 (50-10, 50-237, 50-249)
La Salle 1, 2 (50-373, 50-374)
Quad-Cities 1, 2 (50-254, 50-265)
Zion 1, 2 (50-295, 50-304)

Consumers Power Company
Big Rock Point (50-155)
Palisades (50-255)
Midland 1, 2 (50-329, 50-330)

Dairyland Power Corporation
LACBWR (50-409)

The Detroit Edison Company
Fermi 2 (50-341)

Illinois Power Company
Clinton 1, 2 (50-461, 50-462)

Iowa Electric Light and Power Company
Duane Arnold (50-331)

Northern Indiana Public Service Company
Bailly (50-367)

Northern States Power Company
Monticello (50-263)
Prairie Island 1, 2 (50-282, 50-306)

Public Service of Indiana
Marble Hill 1, 2 (50-546, 50-547)

Toledo Edison Company
Davis-Besse 1 (50-346)

Union Electric Company
Callaway 1, 2 (40-483, 50-486)

Wisconsin Electric Power Company
Point Beach 1, 2 (50-266, 50-301)

Wisconsin Public Service Corporation
Kewaunee (50-305)

Illinois Department of Nuclear Safety
Gary N. Wright, Manager, Nuclear Facility Safety

IE 31 S01

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, DC 20555

March 4, 1982

IE INFORMATION NOTICE NO. 82-03: ENVIRONMENTAL TESTS OF ELECTRICAL TERMINAL BLOCKS

Discussion:

This information notice pertains to the results of NRC sponsored research conducted on electrical terminal blocks (type CF-1518 and CR 2?605 General Electric and type FWM States). These may be typical of those utilized in many nuclear power plants. The research program was conducted at Sandia Laboratories in Albuquerque, NM and consisted of approximately 600 individual tests made on enclosed and open terminal blocks of the type used at TMI-2. The terminal blocks were subjected to 100% humidity conditions at 186°F which were the conditions experienced by some terminal blocks during the TMI-2 accident. (Note: To date, there has been no evidence of terminal block failure at TMI-2 during the TMI-2 accident or after). No tests at other LOCA conditions were conducted. Terminal block performance under the test conditions was measured by monitoring electrical terminal to ground leakage current with terminal to ground voltages of 120, 240 and 480 volts. Some terminal blocks were installed in metal enclosures with a 6 mm pressure relief hole. These metal enclosures were mounted in a horizontal plane during the tests. Some tests were made by simulating chemical spray and various contaminants that may be found on terminal blocks and could result in electrolytic leakage paths in nuclear power plants. The results of these tests indicated instances of leakage currents when blocks were directly exposed to chemicals and steam.

The NRC recognizes that the use of properly designed terminal blocks inside containment is an option of the applicant. NRC requires qualification of all electrical connections, cable splices as well as terminal blocks, for accident conditions.

It is recognized that cleanliness of terminations and terminal blocks in circuits important to safety is of concern to designers, constructors, and licensees. The cleanliness aspects are addressed in Appendix B of 10 CFR 50. These regulations require the licensee to establish appropriate procedures based upon manufacturer's and constructor's recommendations, operating experience, and specific component characteristics to assure that equipment is stored, installed, and maintained in an acceptable state. To this end, IEEE-336, ANS 3.2, and ANSI 45.2.3 Standards and NRC Regulatory Guide 1.39 are being used by designers, constructors, and operators of power plants which address the installation, cleanliness, and on-going maintenance of Class 1E electrical components, including terminal blocks.

In view of the above, licensees are reminded that the plant preventive maintenance program in use at their facilities should assure (1) proper operation of all essential components is achieved throughout the life of the plant; and (2) that periodic inspection of those terminations and terminal blocks for cleanliness and installation integrity is performed following any maintenance activity affecting them.

The Office of Inspection and Enforcement has general inspection procedures which are used by inspectors to monitor compliance with the above Standards, Guides, and recommendations. Terminal blocks are specifically identified as an example of a component which must be inspected for cleanliness during construction of the power plant.

No specific action or response is required at this time. If you have any questions regarding this matter, please contact the Regional Administrator of the appropriate NRC Regional Office.

Attachment:
Recently issued IE Information Notices

Attachment
IN 82-03
March 4, 1982

RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
82-01 Rev. 1	Auxiliary Feedwater Pump Lockout Resulting from Westinghouse W-2 Switch Circuitry Modification	02/26/82	All power reactor facilities holding an OL or CP
80-32 Rev. 1	Clarification of Certain Requirements of Exclusive-Use Shipments of Radioactive Materials	02/26/82	All facility, materials and Part 50 licensees
82-02	Westinghouse NBFD Relay Failures in Reactor Protection Systems at Certain Nuclear Power Plants	01/27/82	All power reactor facilities holding an OL or CP
82-01	Auxiliary Feedwater Pump Lockout Resulting from Westinghouse W-2 Switch Circuit Modification	01/22/82	All power reactor facilities holding an OL or CP
81-39	EPA Crosscheck Program - Low Level Radioiodine in Water Test Program	12/23/81	All power reactor facilities holding an OL or CP
81-38	Potentially Significant Equipment Failures Resulting from Contamination of Air-Operated Systems	12/16/81	All power reactor facilities holding an OL or CP
81-37	Unnecessary Radiation Exposure to the Public and Workers During Events Involving Thickness and Level Measuring Devices	12/15/81	All power reactor facilities holding byproduct material licenses
81-36	Replacement Diaphragms for Robertshaw Valve (Model No. VC-210)	12/3/81	All power reactor facilities holding an OL or CP
81-35	Check Valve Failures	12/2/81	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit