UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N.W. SUITE 818
ATLANTA, GEORGIA 30303

JAN 30 1978

In Reply Refer To:
RII:JPO
50-369, 50-370
50-269, 50-270
50-287

Duke Power Company
Attn: Mr. William O. Parker, Jr.
Vice President, Steam Production
P. O. Box 2178
422 South Church Street
Charlotte, North Carolina 28242

Gentlemen:

Enclosed is IE Bulletin No. 78-02 which requires action by you with regard to your power reactor facility(ies) with an operating license or a construction permit.

Should you have questions regarding this Bulletin or the actions required of you, please contact this office.

Sincerely,

James P. O'Reilly
Director

Enclosures:
1. IE Bulletin No. 78-02
2. List of IE Bulletins
Issued in 1978

cc w/encl:
J. C. Rogers, Project Manager
McGuire Nuclear Station
P. O. Box 2178
Charlotte, North Carolina 28242

cc w/encl: (cont'd)
M. D. McIntosh, Plant Manager
McGuire Nuclear Station
P. O. Box 488
Cornelius, North Carolina 28031

J. E. Smith, Station Manager
Oconee Nuclear Station
P. O. Box 1175
Seneca, South Carolina 29678

UNITED STATES
NUCLEAR REGULATION COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

January 30, 1978

IE Bulletin No. 78-02

TERMINAL BLOCK QUALIFICATION

Description of Circumstances:

On January 18, 1978, Connecticut Yankee Atomic Company performed a screening test intended to verify previous analyses of the environmental qualifications of unprotected terminal blocks used inside containment. The test was performed at the Franklin Institute Research Laboratories, Philadelphia, Pennsylvania.

The test specimen was a Marathon M-6012 terminal block. It was exposed to a steam environment which was designed to envelope the calculated LOCA environmental conditions in the Haddam Neck containment. The pressure selected for the test was 40 psig for a period of 24 hours.

The temperature profile consisted of a rise from an initial temperature of 100 degrees Fahrenheit to 275 degrees Fahrenheit within ten seconds, followed by a steady state operation at 275 degrees Fahrenheit for four hours. This was followed by a drop of temperature to 140 degrees Fahrenheit within one hour, followed by a repetition of the initial temperature rise to 275 degrees Fahrenheit (within ten seconds). The temperature then remained constant at 275 degrees Fahrenheit for the remaining 19 hours of the test period.

During the initial screening test, 525 volts, single phase, 60 Hertz, ac voltage was applied to two pairs of terminals on the test specimen. Inability of the terminals to hold the voltage was defined before the test as an appropriate failure criterion. The test was initiated on January 19, 1978. The terminal block functioned as intended during the first 5 hours of the test at which time one of the pairs of terminals failed the test.

The cause of failure is still under investigation. The failure occurred during an operator error resulting in a pressure and temperature excursion which is outside the envelope of the intended test. Because of this, the licensee reran the test.

dup.

The second screening test was initiated on January 25, 1978. This test included three test specimens: (1) an unprotected Marathon terminal block identical to the one used in the first test; (2) an unprotected Westinghouse terminal block; and (3) a GE terminal block enclosed in a NEMA type 12 box identical to the ones in use in the Haddam Neck plant. The test specimens were exposed to an environment having temperature and pressure profiles essentially the same as those of the first test, minus the inadvertant overpressure transient. All the test specimens successfully operated through the two temperature rise profiles in the test sequence. However, after 21 hours in the test environment, the lower pair of terminals of the unprotected Marathon terminal block failed. The failed terminal points were disconnected and the test was completed. No further failures occurred. The failure mechanism of the terminal blocks during the first and second tests appears to be similar, i.e., the terminal pair that failed in each of the tests was the lower pair on the terminal block. Detailed analysis are in progress to identify the exact cause of failure.

Actions to be Taken by Licensees and Permit Holders:

For all power reactor facilities with an operating license or a construction permit:

(1) Determine whether or not unprotected terminal blocks as used in your facility in systems which must function in the post-accident environment;

(2) If such terminal blocks are used, identify the systems involved and provide the documentation which demonstrates that these terminal blocks have been environmentally qualified; and

(3) If documentation is not available, provide your plans and schedule for achieving full qualification of affected circuits.

For holders of operating licenses, your response to this bulletin is required to be in this office within 14 calendar days of the date of issue of this bulletin.

For holders of construction permits, your response to this bulletin is required to be mailed within 30 calendar days of the date of issue of this bulletin.

Copies of your response are to be provided in the same time frame directly to the Director, Office of Nuclear Reactor Regulation, and to the Director of Reactor Operations Inspection, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Approved by GAO, B180225 (R0072); clearance expires 7-31-80. Approval was given under a blanket clearance specifically for identified generic problems.

IE Bulletin No. 78-02
January 30, 1978

LISTING OF IE BULLETINS ISSUED IN 1978

Bulletin No.	Subject	Date Issued	Issued To
78-01	Flammable Contact - Arm Retainers in G.E. CR120A Relays	1/16/78	All Power Reactors Facilities with an Operating License (OL) or Construction Permit (CP)

Enclosure 2
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