CENTRAL FILES

MAR 4 1977

Consumers Power Company
ATTN: Mr. Stephen H. Howell
Vice President
1945 West Parnall Road
Jackson, MI 49201

Docket No. 50-329
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Gentlemen:

The enclosed IE Circular, 77-03 is forwarded to you for information. No written response is required. Should you have any questions concerning this matter contact the Director of this NRC Regional Office.

Sincerely,

James G. Keppler
Director

Enclosure: IE Circular
No. 77-03, Fire Inside
a Motor Control Center

cc w/encl:
Central Files
Reproduction Unit NRC 20b
PDR
Local PDR
Ronald Callen, Michigan
Public Service Commission
Dr. Wayne H. North
Myron M. Cherry, Chicago

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DATE ➤	3/1/77	3/1				

March 4, 1977
IE Circular No. 77-03

FIRE INSIDE A MOTOR CONTROL CENTER

DESCRIPTION OF CIRCUMSTANCES

On November 22, 1976, a fire occurred in a safety-related ITE Imperial Series 5600 Motor Control Center (MCC) at the Three Mile Island Unit No. 2 facility. The fire was caused by partial engagement of the plug-in connector assembly of a combination circuit breaker/starter unit with the vertical bus. This resulted in a high resistance contact between one connector stab and a vertical bus bar with localized overheating of the stab. The hot stab ignited a vertical insulation backwall which was made of a fiberglass polyester. This backwall was provided as a personnel safety feature by the vendor to provide a barrier between the normally energized vertical bus and the breaker/starter unit compartments.

A similar fire occurred in an ITE Series 5600 Motor Control Center at the Trojan Nuclear Station on March 4, 1976, as a result of a mis-stab of the plug-in connector assembly to the vertical bus. Subsequent to this fire at the Trojan facility, ITE reportedly issued a technical instruction letter to nuclear power plant licensees using these motor control centers to advise them of the potential connector misalignment problem and recommended procedural steps to preclude future occurrences.

This instruction was received by the Three Mile Island Unit No. 2 licensee and was in the process of being implemented; however, the breaker/starter unit which caused the fire at that facility had not yet been checked as recommended in the ITE Instruction Letter. A copy of ITE's technical instruction letter is attached.

The MCC fire at the Three Mile Island Unit No. 2 facility essentially destroyed the entire motor control center. The insulation backwall continued to burn after the MCC was de-energized and the fire progressed upward and ignited a similar plastic barrier near the top of the MCC which was provided to separate the horizontal bus from the wireway. The fire apparently continued along the horizontal barrier igniting the other vertical backwall barriers and destroyed most of the breaker/starter unit in the MCC.

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RECOMMENDED ACTION TO LICENSEES:

If motor control centers similar to those described are in use in safety-related systems or in proximity to safety-related systems, you should verify that your maintenance procedures contain adequate provisions to insure that the electrical stab connection in these units are properly aligned to their respective vertical bus bars to assure that a positive and full engagement exists between the connector stab and its associated vertical bus bar. Specifically you should review the ITE technical instruction letter and follow the recommended procedure outlined in this letter.

You should also determine if the materials which are used for bus insulation and supports in these motor control centers have flame retardant ratings equal to or better than a 94 V-O classification as covered in UL Standard No. 94 entitled, "Tests For Flammability Of Plastic Materials."

No written response to this Circular is required. If you require additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

Attachments:
1. ITE's Technical Instruction ltr
2. Instruction Procedure for ITE 5600 Motor Control Center Units

COPY OF ITE TECHNICAL INSTRUCTION LETTER

Gentlemen:

All Motor Control Centers, 5600 Series, are built and factory inspected to Class IE specifications to insure that when shipped to the jobsite they will function as intended.

In spite of the rigorous and thorough inspection of Class IE equipment by I-T-E, as well as, the separate inspection group contracted by the buyer, a malfunction occurred at the Trojan Nuclear Facility of Portland General Electric on March 1976 - MCC #B56 shipped on December 15, 1972. The malfunction appears to be due to an apparent mis-stab of the plug-in connector assembly to the vertical bus on a Size 4 combination circuit breaker starter.

All front mounted control centers having rear access are visually inspected to insure proper engagement of stabs on the bus. While the thorough final inspection made, just prior to shipment are documented, the validity of such factory inspections are destroyed whenever starter units are moved from one compartment to another at the jobsite due to layout or wiring changes or when starters are removed for ease of pulling load cables or maintenance of the unit.

Motor Control Centers, in accordance with the state-of-the-art, are designed to have plug-in capabilities for ease of changes or maintenance. However, it cannot be assumed that the plug-in units can be treated without regard to strict attention to handling and protecting while it is removed from the vertical sections. Deformation of stabs can occur if units are not protected against mechanical damage. For your field inspection of units, we can supply you with a bus stab guage and instructions which will insure that the units are reinstalled correctly.

Due to the critical loads involved on Class IE equipment, we suggest that stabs be visually inspected where possible. Motor Control Centers with front mounted units only, 20" deep, can be visually inspected by merely opening the two hinged, half height rear doors. However, with back-to-back mounted units, or Motor Control Centers mounted against the wall, the inspection of the stabs can only be performed with the use of special equipment.

If there is any doubt as to the thoroughness of such field inspection on units now installed, an inspection should be performed at the earliest possible time for possible mis-stab of the plug-in connector assembly to the veritcal bus.

With respect to the bus stab gauge referenced to in Paragraph 4, one of these bus stab guages will be forwarded to you on a "no charge" basis as soon as you can advise us the exact shipping address and to whose attention is should be shipped.

Attachment 2

INSTRUCTION PROCEDURE FOR FIELD VERIFICATION OF PROPER BUS PLUG-IN FINGER ALIGNMENT FOR I-T-E 5600 MOTOR CONTROL CENTER UNITS

CAUTION: Whenever a starter plug-in unit has been removed from the Motor Control Center the bus plug-in feature must be verified for correct alignment of the bus plug-in fingers using I-T-E Gauge No. FB-2104-1C as follows:

(1) Slide alignment gauge over the rear flanges of the starter mounting panel. Left to right orientation of the fixture must match the plug-in assembly on the rear of the panel.

(2) Seat the stops on the inside of the ends of the alignment gauge against the flanges of the starter mounting panel as illustrated.

(3) The 1/4" round bars welded to the gauge approximate the vertical bus positions in the MCC. These bars should be within the flared ends of the plug-in fingers, allowing the fingers to self-center themselves lightly around the bars. If fingers are not deformed, there will be no problem visually verifying correct self-centering engagement as illustrated below.

(4) If the self-centering action is not properly achieved, the plug-in assembly must be repaired or replaced.

(5) After correct gauging, the starter should be handled with care and immediately installed into the Motor Control Center.