GE Electrical Distribution
and Control

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February 25, 1989

Mr. William Brach
Chief, Vendor Inspection Branch
Division of Reactor Inspection and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: NRC BULLETIN 88-10: TEST PROGRAM

Dear Mr. Brach:

We have carefully reviewed the Test Program included in Bulletin 88-10, comparing it with industry standards, factory and laboratory practices, and our own field experience.

We would like to recommend modification of two portions of the program. We feel that the present requirements will result in apparent breaker failures that are actually due to limitations in test requirements, test equipment, and testing technique. They are as follows:

2.2 - Individual Pole Resistance or Millivolt Drop

Both pole resistance and millivolt drop are difficult to measure accurately and consistently. The purpose of the test is to determine the likelihood of overheating. A direct measurement of temperature at rated current is much preferred over either pole resistance or millivolt drop measurements, and directly addresses the purpose of the test. Temperature measurements can be taken during the Rated Current Hold-In Test using a temperature probe at line and load connection points.

Circuit breakers are typically designed for a maximum temperature rise of 50°C, but we are recommending a 55°C limit to allow for any inaccuracies in field measurements and test conditions. The 55°C rise at rated current will result in safe operating conditions and assure that thermal runaway will not occur.

We recommend that the temperature test be permitted as an alternate to Millivolt Drop/Pole Resistance.

If the Millivolt Drop Test is to be run, we recommend that use of alternating current equipment be permitted. AC equipment is needed for other portions of the test program and is much more commonly available than DC equipment. There is some concern that induced voltage will affect the millivolt readings if AC is used. The leads from the millivolt meter to the breaker test points should be twisted together as far as possible to minimize any possibility of induced voltage in the leads.

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2.2 - Individual Pole Resistance or Millivolt Drop (Cont'd.)

We request that the Bulletin be modified to permit AC millivolt drop measurements.

Finally, we suggest for both pole resistance and millivolt drop, that a 2-to-1 variation among poles of a breaker be permitted, instead of the 50% now allowed in the bulletin. This is consistent with our publication "Molded Case Circuit Breakers: Application and Selection," and the recommendations of other manufacturers.

2.5.2 - Adjustable Instantaneous Setting Circuit Breakers

These tests are conducted in the factory and laboratory using equipment with accurately adjustable pulse width and magnitude, and with synchronous closing to eliminate offset currents. Operator experience and technique are extremely important in accurately determining the trip point. Trip points are determined in the factory and laboratory by technicians who run Instantaneous Trip Tests daily.

Similar equipment sophistication and technician experience will not be typically available for field testing. We, therefore, recommend that the U/L trip current tolerances presently included in the test program be broadened.

NEMA AB-2 suggests broader limits in recognition of the importance of equipment and test technique in accurately determining the trip point. We recommend that the trip tolerance be broadened to ±25% on the high setting and ±30% on the low setting, in accordance with NEMA AB-2.

We will appreciate your consideration of our recommendations. We believe that these changes will serve the purpose of the test program and will reduce misleading or erroneous results.

Sincerely,

W. J. Heerlein, Manager
Production & Quality Eng.

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