

LOG OF MEETING

CPSA 6 (b)(1) Cleared
No. of PIVL bits or
Products Identified
Requested by
Date Marked
Complaints Processed

SUBJECT: Receptacle type Ground-Fault Circuit-Interrupters (GFCIs)

DATE: May 9, 1994 **PLACE:** NEMA Headquarters,
Washington, D.C.

LOG ENTRY SOURCE: A. Albert Biss, ESEE

LOG ENTRY DATE: May 13, 1994

COMMISSION PARTICIPANTS: A. Albert Biss, William H. King, Jr.,
Carolyn Meiers, Terry VanHouten

NON-COMMISSION PARTICIPANTS:

- o **National Electrical Manufacturers Association (NEMA):**
Steve Vastagh, Chairman, GFCI Product Section
Tim Feldman, Staff Official
- o **GFCI Manufacturers:**
Jim Cook, Director of Marketing,
Eagle Electric Manufacturing Co., Inc.
Saul Rosenbaum, Vice President Research,
Leviton Manufacturing Company, Inc.
Jack Wells, Vice President, Corporate Development,
Pass & Seymour, Inc.
John Young, Energy and Automation Manager,
Siemens Electric Company
- o **Underwriters Laboratories, Inc. (UL):**
John Konz, GFCI Product Specialist, Melville Office
Dave Hataaja, Manager Government Affairs
- o **Product Safety Letter:** Mary Spock, Reporter

SUMMARY OF MEETING:

CPSC staff requested the meeting with NEMA to discuss the "Failsafe" and "Miswired" safety issues involving receptacle type GFCIs. The four manufacturers in attendance are members of NEMA's GFCI Technical Committee which is part of the "Ground Fault Personnel Protection Section" composed of 17 members. These four manufacturers supply about half of the GFCI market. One GFCI manufacturer not belonging to the Section is the Goldstar Company of Korea.

In regard to the "Failsafe" issue, I suggested using the term "Failed Unsafe" since Mr. Frank Kitzantides, NEMA Vice President, objected to the "Failsafe" designation in

his August 1993 letter. A "Failed Unsafe" GFCI is one in which the electronic trip circuit has failed but after resetting, continues to function as a standard receptacle outlet.

In his letter, Mr. Kitzantides stated that "the Committee believes that the present test feature and periodic testing provides the most reliable means of ensuring proper operation of GFCIs". I objected to this premise in that CPSC staff believe that consumers seldom test their GFCIs and, therefore, would not know that the trip circuit was functional. No one contested CPSC's position.

I cited one electrocution incident involving a GFCI that failed in service and continued to function as a standard receptacle outlet. The manufacturer identified with this incident, found approximately 60 failed units in product returns. An electrician reported several failed GFCIs within a year of installation. Also, CPSC staff have personal experience with failed GFCIs. The manufacturers wanted more detailed information on these and any other incidents. However, even though the GFCI incidents could not be quantified, manufacturer's response was very positive, saying "let's fix it".

"Failed Unsafe" Recommendations:

The "Failed Unsafe" matter is a follow-up issue from the CPSC/NEMA meeting held in September 1992 and from the CPSC/UL annual product review meeting held in February 1994. CPSC staff suggested that manufacturers consider the following possible remedies:

- (1) Consider a GFCI design change to prevent unprotected power at the receptacle in the event of electronic trip circuit failure, or
- (2) Consider a design change to provide an indication that the GFCI trip function has failed and that the GFCI may need to be replaced.
- (3) Consider design change so that there would be less reliance on monthly testing of GFCIs.

The manufacturers were not at liberty to divulge their design innovations or considerations in front of competition. They suggested meeting individually with CPSC.

"Mis-wired" GFCIs:

Since the September 1992 meeting, the "Mis-wired" GFCI issue has surfaced. A "Mis-wired" GFCI is one in which the "Line" and "Load" wire connections to its terminals have been reversed.

In either case, i.e. whether "Mis-wired" or "Failed Un-safe", the GFCI functions as a standard receptacle outlet but does not provide ground fault protection to its integral receptacle.

CPSC staff has received reports from the electrical inspection and home inspection associations and a consulting engineer that many "Mis-wired" GFCIs are being found installed in homes.

CPSC staff procured receptacle type GFCI samples from six different manufacturers and passed out a sketch showing the back terminals, front components, and markings. The sketch shows the variations in terminal markings, terminal configurations and markings which are confusing and hard to read in some cases, which may be part of the cause for "Mis-wiring". Based on this review, CPSC staff suggested the following recommendations which would make GFCIs more user friendly and help make for correct installations:

- (1) Standardize Terminal Markings,
- (2) Provide glossy finish on GFCI back and face to make imprinted markings and instructions easier to read.
- (3) Use different colors for "test" and "reset" buttons that are also different from the face,
- (4) Simplify instructions provided with the GFCI, and
- (5) Standardize terminal positions.

I complimented the NEMA Technical Committee for its proposal of a stick-on label to be placed over the "Load" terminals of receptacle type GFCIs. After discussion of the label text, the group revised the label as follows :

LOAD TERMINALS

**Do not connect until you read & follow instructions.
Miswiring can leave this outlet unprotected.**