

(2)

CPSC/OFC OF THE SECRETARY
FREEDOM OF INFORMATION

1999 FEB 11 P 3:39

LOG OF MEETING
DIRECTORATE FOR ENGINEERING SCIENCES

SUBJECT: Arc Fault Circuit Interrupters (AFCI) Testing
by Cutler-Hammer

DATE OF MEETING: December 9, 1998

PLACE OF MEETING: Cutler-Hammer Technology and Quality Center,
170 Industry Drive, RIDC Park West, Pittsburgh, PA

LOG ENTRY SOURCE: Doug Lee, ESEE *DL*

COMMISSION ATTENDEES:
Doug Lee, ESEE

NON-COMMISSION ATTENDEES:
Robert Clarey, Cutler-Hammer
Bruce Terhorst, Cutler-Hammer
Joe Engel, Cutler-Hammer
Bob Elms, Cutler-Hammer
Richard Sabel, Cutler-Hammer
John Wafer, Cutler-Hammer
Clive Kimblin, Cutler-Hammer

CPSA 6 (b)(1) Cleared

No Mfrs/Prvtlblrs or *DL*

Products Identified

Excepted by _____

Firms Notified,

Comments Processed.

SUMMARY OF MEETING:

The purpose of the meeting was to update the test equipment that is on loan to the Commission. A new wood block was replaced on the guillotine tester to simplify testing.

Additional AFCI tests required in the Standard for Arc-Fault Circuit-Interrupters, UL 1699, were witnessed. Methods of wire preparation that are part of the tests were also observed.

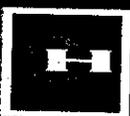
Various other topics were briefly discussed including NFPA 73 - Residential Electrical Maintenance Code for One- and Two-Family Dwellings, website linking and public education on AFCIs.

Cutler-Hammer provided an update of additional AFCI products. A copy of the Cutler-Hammer brochure is appended to the meeting log.

PROTECTION

**CUTLER-HAMMER ARC FAULT
CIRCUIT INTERRUPTERS**

*Providing Enhanced Protection
for Your Home and Family
Against the Risk of
Electrical Fires*



Cutler-Hammer

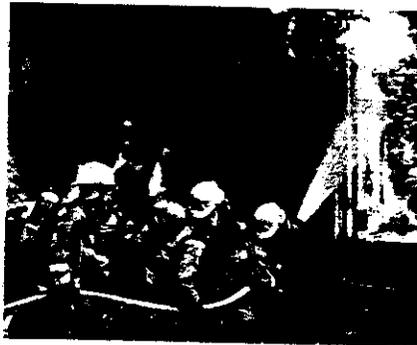
EATON

Cutler-Hammer Arc Fault Circuit Interrupters

Affordable Advanced Technology Provides Peace-of-Mind Safety in Residential Dwellings

Revolutionary Breakthrough Expands Residential Circuit Breaker Capabilities

All residential circuit breakers provide overload protection, short circuit protection, and (when specified) ground fault protection. But none provide protection against potential fire hazards that can result from arcing faults...until now! Cutler-Hammer, the world leader in innovative circuit breaker technology for over 70 years, has developed the solution to enhancing protection against arcing faults.



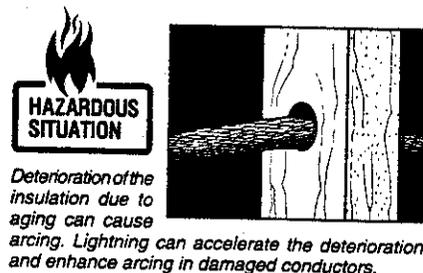
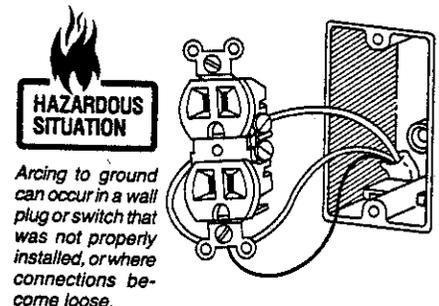
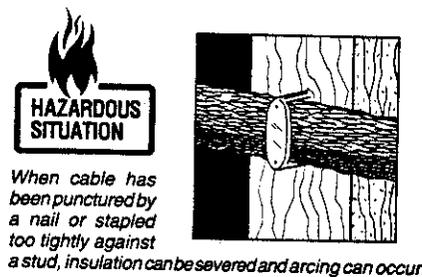
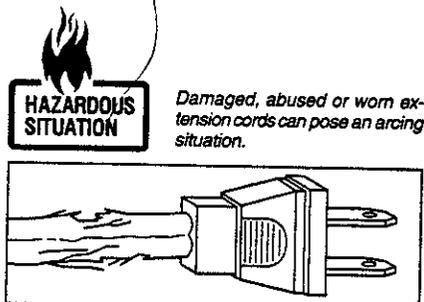
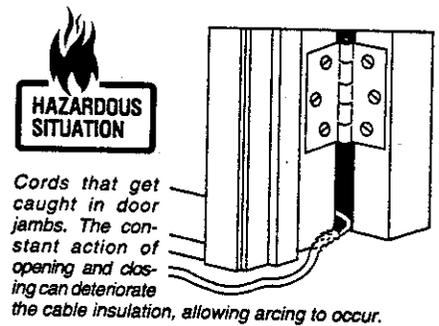
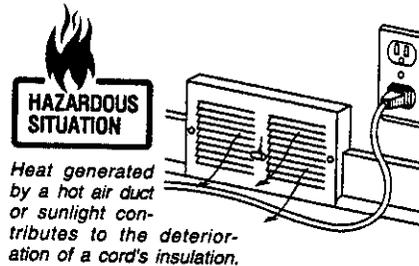
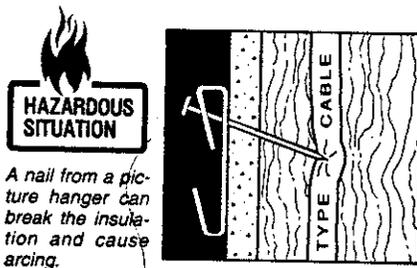
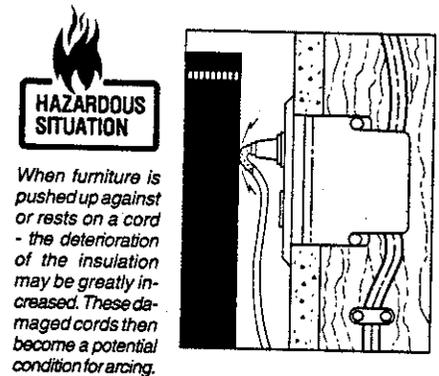
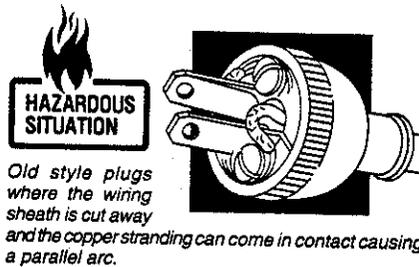
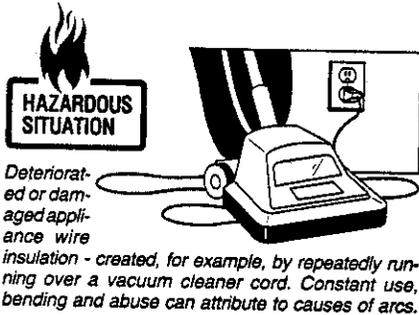
The Consumer Products Safety Commission recently reported that of 451,000 home fires nearly 43,000 were attributed to the electrical system. Arcing faults are one cause of the fires.

Short Circuits and Arcing Faults... There is an Important Difference

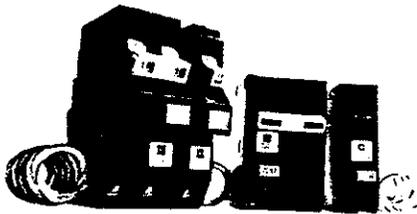
- **Short circuits** (also known as faults) are usually high and rapid current flows. These short circuits are quickly detected by conventional circuit protective devices.
- **Arcing faults** are characterized by low and erratic current flow. Due to these characteristics, arcing faults in damaged cords or cables can continue undetected by conventional circuit protective devices, thus creating hazardous situations such as ignition of nearby combustible materials.

TYPICAL CAUSES OF DANGEROUS ARCING FAULTS

Arcing faults can occur in homes, apartments, or any other residential dwellings where there's deterioration in wire insulation caused by one or more of these hazardous situations.



**For Enhanced Protection...
Cutler-Hammer Arc Fault
Circuit Interrupters**



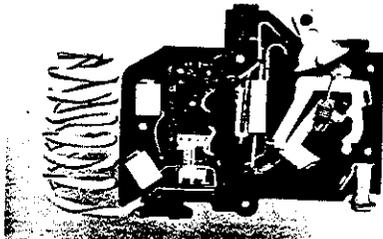
**Four Levels of Protection
...Only from Cutler-Hammer**

- Overload
- Short Circuit
- Arc Fault Detection
- Ground Fault

**Enhanced Protection through
Technology...for Your Peace of Mind**

**Cutler-Hammer Arc Fault Circuit
Interrupter Breakthrough Provides
Enhanced Protection from Dangerous
Arcing Faults...and More**

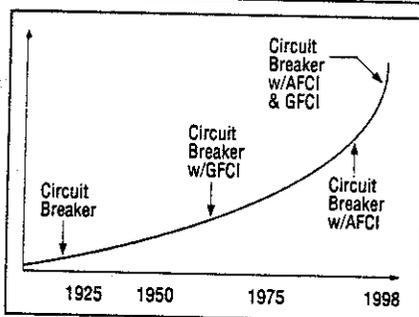
- **Proven solid state electronic-based technology**, used successfully for many years by Cutler-Hammer in commercial and industrial applications, has been brought successfully to the residential circuit breaker.



- **AFCI Technology**, the heart of the Arc Fault Circuit Interrupter, enables it to recognize the unique characteristics of an arcing fault...resulting in tripping the breaker, thus interrupting the circuit.
- **Conventional breaker protection characteristics** – overload and short circuit protection – are also provided in Arc Fault Circuit Interrupters.
- **An added safety feature of ground fault circuit interruption** is available as an option on 15 and 20 ampere Arc Fault Circuit Interrupters. This provides protection for people from the hazards of electrical shock. Ground fault protection for personnel is required by the National Electric Code (NEC) in several residential locations including bathrooms, kitchens, garages, permanent and storable swimming pools, and spas and hot tubs.

 Underwriters Laboratories Inc.®
Listed Circuit Breaker Also Classified for
Mitigating the Effects of Arcing Faults

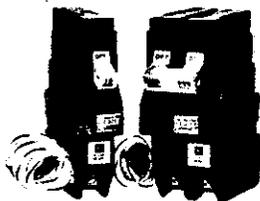
**THE HISTORY OF RESIDENTIAL
CIRCUIT BREAKER TECHNOLOGY**



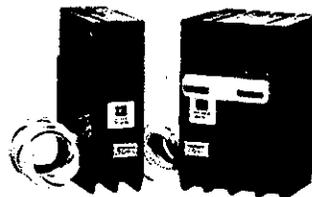
CUTLER-HAMMER TECHNOLOGICAL ADVANCES

Date	Protection Device	Type of Protection	Advantage
1920	Circuit Breaker	Thermal	Protects conductor against overloads
		Magnetic	Protects conductor against short circuits
1968	Circuit Breaker with Ground Fault Circuit Interruption (GFCI)	Thermal	Protects conductor against overloads
		Magnetic	Protects conductor against short circuits
		GFCI Circuit Board (5 mA leakage detection)	Protects people from fatal electric shock
1997	Circuit Breaker with Arc Fault Circuit Interruption (AFCI)	Thermal	Protects conductor against overloads
		Magnetic	Protects conductor against short circuits
		AFCI Circuit Board (detects arcing faults)	Reduces risk of electrical fires started by arcing faults
1998	Circuit Breaker with AFCI and GFCI	Thermal	Protects conductor against overloads
		Magnetic	Protects conductor against short circuits
		GFCI Circuit Board (5 mA leakage detection)	Protects people from fatal electric shock
		AFCI Circuit Board	Reduces risk of electrical fires started by arcing faults

TWO AFCI PRODUCT OFFERINGS



**Type CH
3/4" Wide
AFCI Circuit
Breakers**



**Type BR
1" Wide
AFCI Circuit
Breakers**

Poles	Ampere	Configuration	Catalog Number
Single-Pole	15 Amp	AFCI	CH115AF
		AFCI w/GFCI [ⓐ]	CH115GFAP [ⓐ]
	20 Amp	AFCI	CH120AF
Double-Pole [ⓑ]	15 Amp	AFCI w/GFCI [ⓐ]	CH120GFAP [ⓐ]
		AFCI	CH215AF [ⓐ]
	20 Amp	AFCI w/GFCI [ⓐ]	CH215GFAP [ⓐ]
		AFCI	CH220AF [ⓐ]
		AFCI w/GFCI [ⓐ]	CH220GFAP [ⓐ]

[ⓐ] Double-pole AFCI breakers are designed for use in 3-Wire, 120/240V AC circuits, 120V AC multiwire circuits utilizing a shared neutral (often referred to as a "home run" circuit), and 240V AC circuits obtained from 120/240V AC source.

Poles	Ampere	Configuration	Catalog Number
Single-Pole	15 Amp	AFCI	BR115AF
		AFCI w/GFCI [ⓐ]	BR115GFAP [ⓐ]
	20 Amp	AFCI	BR120AF
Double-Pole [ⓑ]	15 Amp	AFCI w/GFCI [ⓐ]	BR120GFAP [ⓐ]
		AFCI	BR215AF [ⓐ]
	20 Amp	AFCI w/GFCI [ⓐ]	BR215GFAP [ⓐ]
		AFCI	BR220AF [ⓐ]
		AFCI w/GFCI [ⓐ]	BR220GFAP [ⓐ]

[ⓐ] GFCI Capability – provides for ground fault personnel protection at 5 milli-ampere leakage-to-ground. The NEC requires the use of GFCI protection for various residential circuits.

[ⓑ] Available in the first quarter of 1998.

Cutler-Hammer, a part of Eaton Corporation, is a leader in the development and manufacturing of power distribution equipment, electrical control products, and advanced industrial automation solutions.

For more information on Cutler-Hammer products and services, call 1-800-525-2000 or 1-732-417-5660. Or visit our web site at www.cutlerhammer.eaton.com

Cutler-Hammer
Pittsburgh, Pennsylvania

Publication No. B.31C.01.S.E
October, 1997
Printed in U.S.A. / CMS 3931

EATON