

In the News

Expanded AFCI Requirements Spark Controversy

In June, the National Fire Protection Association — which publishes the National Electric Code — voted to greatly expand requirements in the 2008 code for residential use of arc-fault current interrupters (AFCIs). These devices prevent fires caused by faulty wiring; unlike conventional circuit breakers (which trip on gross faults) or ground-fault circuit interrupters (which cut off power to a circuit if they detect an imbalance between the hot and neutral conductors), AFCIs trip in response to unintentional arcs in household wiring. Already, the more stringent rules are provoking debate within the industry — even though they won't take effect until January.

Back story. Requirements for AFCIs aren't new: The devices have been cropping up in the NEC for several years, ever since an amendment to the 1999 code mandated their use in all bedroom receptacles. The 2002 code extended that requirement to all bedroom outlets, including light fixtures, receptacles, and smoke alarms. And the 2005 code reduced current levels and required for the first time that the devices detect both series and parallel arcs. (Series arcs occur when the current jumps a gap, as when a wire is cracked; parallel arcs form when damaged insulation allows the current to jump between conductors, or from a conductor to ground.)

Now the pending 2008 code has gone even further, specifying combination-type AFCIs — the type capable of detecting both kinds of arc — in all 120-volt 15- and 20-amp circuits that supply "dwelling-unit family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, or similar rooms or areas."

Advocates tout fire prevention. Gerard Winstanley of the National Electrical Manufacturers Association (NEMA) contends that the new AFCI requirement will prevent numerous fatal fires. "I expect them to have a similar effect to smoke alarms on reducing fire deaths," he says. "That data will be collected 10 or 20 years down the line." He refers to figures on NEMA's consumer-information Web site (www.afcisafety.org) that ascribe 67,800 fires, 458 deaths, and \$868 million in property losses to home electrical problems each year. (It should be noted, however, that estimates of losses from fires of electrical origin vary widely according to source; the Underwriters Laboratory Web site, for example, puts the figures at 32,000 fires, 220 deaths, and \$674 million in damages, while a 2006 NFPA report cites 19,100 fires, 140 deaths, and \$349 million in damages.)

According to Winstanley, the difference in cost between a conventional circuit breaker and a combination-type AFCI is typically about \$15, meaning it should cost \$200 or less to install a full complement of AFCI breakers in a typical new home. "That's a fairly small outlay," he says. "Once it's explained, consumers will accept them."

Opponents predict glitches. Other industry observers, however, are skeptical; they question not only NEMA's numbers but also its motivation, noting that the electrical manufacturers themselves are in the business of selling the mandated products. Independent NEC expert Mike Holt, for example, contends that AFCI technology is "not even close" to being ready for general use. Few electrical contractors, he says, have experience with the new combination AFCIs, making it impossible to know whether normal arc-producing events like distant flashes of lightning or the operation of motorized devices will lead to widespread nuisance tripping. "I'm totally convinced there will be a huge problem," he says.

