



# MONTHLY

News and Views from the Connecticut Association of Home Inspectors, Inc.

December 2005

## Inside this Issue

President's Corner	2
Connecticut Law Seminar	2
Article - InterLock Roofing	4
2006 Meeting/Seminar Schedule	4
Article/Speaker Reward	7
Contact CAHI	7

## Meeting Dates

### No December Meeting

- Jan 14** *CT Law Seminar – Holiday Inn, North Haven*
- Jan 25** *Metal interlocking roofing shingles – Jerry Fant, InterLock Roofing*
- Feb 22** *Masonry Construction - George Torello Engineers*
- Mar 22** *Mold Assessment - Gil Cormier, Industrial Risk Control Services, Inc.*
- Apr 14** *Potability of Groundwater Systems - Ronnie Fields, Premier Laboratory*

**Holiday Inn  
201 Washington Ave  
North Haven  
(203) 239-6700**

## In the real world, not everything gets better with age

*neccdigest™, Spring 2004*

*by Jim Lardear*

Submitted by Dwight Uffer

As an electrical professional, you know the difference between a conductor and an insulator, but the typical homeowner does not give it a lot of thought. They flip a switch and a light goes on. If they need to plug in a new appliance, they find an open outlet. If they need more outlets, they get an extension cord or power strip.

The electrical wiring systems that power the conveniences of modern life are hidden in walls and in panel boxes in basements. They are out of sight and out of mind. But that does not mean they are not overloaded and under severe stress.

As homes in the United States age – currently half of all homes are at least 50 years old – their wiring systems may not be keeping up with the ever-increasing demands placed on them. As their quality and safety deteriorate over time, potential hazards posed by aging residential wiring systems can be unseen or just casually neglected by homeowners or renters.

According to the National Science and Technology Council's Wire System Safety Interagency Working Group report issued in 2000, the aging of electrical wiring systems is a *national* safety issue.

Each year in the United States, it is estimated that there are as many as 41,500 fires in homes related to electrical wiring systems, resulting in 1,400 injuries and 350 deaths with damage estimates ranging from \$650 million to \$1 billion annually. While older homes are at a greater risk, newer ones are not immune from the dangers of poor wiring practices or the environmental stresses placed on wiring systems.

The reality is that this is not a witch-hunt for defective products. Most of the electrical wiring systems that went into homes in the 1960s, '50s and '40s are at – or close to – the end of their design life. If these products are showing some kind of deficiency after 50 or 60 years of service, no one in the industry is hinting that there was a design flaw.

"This issue is vendor make and model neutral," says William King, Chief Engineer for Electrical/Fire Safety, United States Consumer Product Safety Commission (Bethesda, MD). "We are on the threshold of an emerging problem."

### A disturbing trend

Across the board, the number of causes of fires is going down due to better codes, smoke alarms and fire suppression systems. Houses being built today won't have to face the same problems as the lion's share of the estimated 100 million existing homes in the United States. However, the number of electrical wiring fires in older homes,

*(continued on page 3)*

## President's Corner

Bernie Caliendo

**O**n behalf of CAHI's Officers and Directors, I would like to extend our sincere wishes that everyone have a safe, happy, holy, merry and healthy holiday season and a very prosperous New Year in 06!

**No December Meeting**

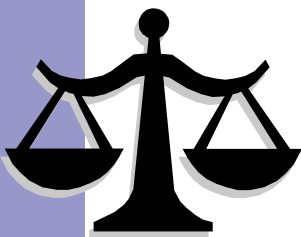
Here we are with snow on the ground and cold weather setting in. With home heating fuel prices at record levels, we all must do our due diligences to observe any abnormal, hazardous conditions or contraptions that may be present in the homes we inspect. As some homeowners try to stem the high cost of heating their home, they may be creating a life threatening condition in regard to carbon monoxide and/or fire hazards with what they think are their ingenious contraptions. You must be vigilant and not only observe any potential hazards. If you find that public health, safety or welfare is at risk, it is imperative and required you report it to the appropriate persons for emergency action, as stated in the state Code of Ethics 20-491-14c.

*The presence or lack of life saving safety devices should always be observed.*

Your report should always recommend the installation, maintenance of and proper location of these appropriate devices.

- Working smoke detectors should be present in every bedroom and one on every level.
- Carbon monoxide detectors with "nighthawk" technology should be present on every level approximately five feet above the floor for any home with a fuel burning appliance including, but not limited to, oil, gas, wood, coal, and pellet fired heating, cooking units and fireplaces.
- Propane/natural gas detectors where gas supply is used.
- GFI protected outlets/circuits in wet or potentially wet areas inside and out.
- Heat detectors can act as an early warning system.
- If a home has a security system, recommend that the system be checked by the company for proper installation and performance of all safety devices.

***Saving a life is priceless!***



## Connecticut Law Seminar

**January 14, 2006**

**8:00 - 11:00 am**

**Holiday Inn, North Haven, CT**

CAHI is sponsoring the required CT Law Seminar featuring Attorney Kent Mahwinney. Anyone who has heard Kent speak knows he has a wealth of important information concerning Connecticut law. CAHI will be providing a continental breakfast and refreshments during the breaks. Everything is included - \$99.00.

Sign up and pay at our web site, [www.ctinspect.com](http://www.ctinspect.com). On the home page, click on "special events" and click on Ct Law Seminar. Fill in the information and pay by credit card. It's that easy!

This 3 hour course is required as part of the 20 continuing education hours for licensing renewal. Get it under your belt NOW!

Sign up today! Checks may also be sent to our Treasurer Pete Petrino at CAHI, 18 Garden Place, Derby, CT 06418

*(continued from page 1)*

which can be especially vulnerable to aging wiring and overloaded circuits, is not following the same downward trend.

"Unless we do something about these older homes and their aging wiring systems, it may be an even greater problem in the future," King says. According to the United States Census Bureau's 1999 Annual Housing Survey, there are 70 million homes (or 71% of all housing units) that are at least 20 years old...and they aren't getting any younger.

In some respects, just by making a casual observation of older houses, you can understand why these fires are continuing to occur.

"Everything else, from roofs to furnaces to windows and even electrical circuit breaker and fuse panel boxes, generally get upgraded at some point," King says. "The rest of the electrical wiring system is embedded in the walls and these branch circuits rarely get replaced. That is the issue, but how do you deal with it? At some point, you may just have to abandon those wires."

### **Top 3 residential wire safety issues**

The problems associated with residential wiring systems are due to the cumulative effects of many environmental stresses, as well as the wear and tear of daily use.

"When you look closely into the data, there are three problem areas that the CPSC has identified year after year. The first is just degradation over time," King says. Both insulators and conductors deteriorate with age. "Degradation is just a natural consequence of being in use for a long time."

Heat, light and temperature affect insulating materials, while oxidation and films that can cover conductors at connection points affect conductors. Conductors can also get brittle from flexure and the heat generated from light fixtures, especially those that are over-lamped or left on all the time.

However, the industry's knowledge of how wiring systems age and deteriorate and how they fail is limited.

"How badly wire ages is very difficult to predict," says Dave Mercier, technical director, Electrical Division, Southwire Company (Carrollton, GA). Southwire is

North America's largest building wire producer and one of the world's leading wire and cable manufacturers.

"The aging of insulation in dry locations is due to loss of the plasticizer in PVC insulation," Mercier says. "This loss of plasticizer is dependent on a time/temperature relationship. The higher the temperature the shorter the wire's life expectancy."

In residential installations, overheating is found many times in applications where homeowners exceed the maximum wattage rating for fixtures. "It is difficult to know what circuits in residential installations are heavily loaded, resulting in accelerated loss of plasticizer, [which in turn results] in brittle insulation," Mercier says.

In reality, there has been little or no innovation in the wire and cable industry over the last 20 to 25 years. The last major change in residential wiring was in 1985 when the required maximum temperature rating of NM cable was increased to 90° C while keeping the ampacity to 60° C. "This has worked very well," Mercier says.

According to Mercier, the aging of wire in wet locations is caused by water absorption into the insulation reducing its dielectric strength.

"When working with older wiring it is many times better to replace wiring that is being disturbed than to risk cracking brittle insulation," Mercier says. "Some electricians use a rule of thumb that says 30-year-old wiring should be replaced since it is difficult to predict how badly it may age."

The second issue is there is more electrical load today as people have more appliances and just expect their electrical systems to keep up. Homeowners will do things like add more circuits or outlets, put in larger fuses or add another circuit breaker where there is a blank spot in their panel. In short, they will do whatever it takes to get up and running.

"The load today is more than what those electrical systems were designed to originally handle just a few decades ago," King says.

The third factor is that homeowners have involved themselves in the wiring systems and have not followed code practices.

"Upgrades to wiring systems many times are simple extensions to add additional circuits for additions or kitchen upgrades," Mercier explains. "Many times these may be done by unskilled people leaving installations that

*(continued on page 5)*

## Metal roofs offer many advantages

Submitted by Ken Mita

Topping off home improvements is the roof. It may not be the sexiest part of a house, but it's definitely one of the most important components for keeping everyone warm, dry and secure. Interlock Industries of Canada manufactures an aluminum shingle roof that is revolutionizing the industry. Interlock supports the product with a lifetime non-prorated warranty with a 50 year transfer. This lightweight, permanent material comes in 10 designer colors. A number of Connecticut homeowners have already installed this remarkable new system.

The 35-year old company based in Vancouver, Canada, recently opened a new distribution center in Walpole, Massachusetts to serve homeowners in the six New England states, according to Dan Adolfson, general manager for the Atlantic division. "We are making a major commitment to the New England market, and display homes are part of that commitment. We want to introduce ourselves to the region."

According to Adolfson, the Interlock system provides major advantages over a conventional asphalt roof. The unique interlocking design insures that the shingles are locked in place for a lifetime. The roof can withstand winds of 125 miles per hour. Snow slides off, eliminating the problem of ice dams. The surface is impervious to salt spray, acid rain, bird droppings, and many other pollutants that can accelerate the breakdown and decomposition of conventional roofs.

Aluminum also reflects heat, making the home much cooler in the summer and warmer in the winter. This energy efficient characteristic of the Interlock roof makes great economic sense, saving owners thousands of dollars as the cost of heating fuels and air conditioning continue to escalate. The lightness of aluminum is also a major advantage, since it does not put the strain of a heavy roof on a home.

Interlock roofs come in a variety of color bonded finishes to complement the aesthetics of any architectural style, according to Adolfson. "You really can get any look you want from European tile red to the particularly popular "aged copper", but the newest design, Slate-lite is sculpted from authentic weathered slate. It is available in charcoal gray or black, for a classical New England look without the weight of natural slate", he said.

Interlock is the manufacturer, and installer of these fully guaranteed roofs. The roof package includes all accessories such as flashing and chimney collars. "Because we are a soup-to-nuts company, you can be assured of a quality product and quality services." Interlock consultants make home visits, demonstrate the advantages Interlock can offer the homeowner and give an estimate.

More to come in the January newsletter

Articles published in the CAHI Monthly are the sole opinion of the author. CAHI does not endorse or state a position for or against the content of said articles.

### 2006 Meeting and Seminar Schedule

#### January 14<sup>th</sup> - CT Law Seminar

8:00 - 11:00 am, Holiday Inn, North Haven, CT. Attorney Kent Mahwinney presenting another dishing out of CT Law information. 3 hour required credits for licensing renewal, continental breakfast and refreshments at the breaks. \$99.00 open to all inspectors & interns.

#### January 25<sup>th</sup> - Monthly Meeting

Jerry Fant from InterLock Roofing will be presenting a seminar on metal interlocking roofing shingles.

#### February 22<sup>nd</sup> - Monthly Meeting

George Torello Engineers doing a presentation on masonry construction. We have never had a masonry seminar before and there will be plenty to learn. There will be a special \$25 fee accessed to all non-member licensed inspectors at the door. Interns are free.

#### March 22<sup>nd</sup> - Monthly Meeting

Gil Cormier from Industrial Risk Control Services, Inc. will be resenting mold assessment in home construction. Gil is a Certified Industrial Hygienist and did a presentation for us in early 2002. The place was packed. Get there early to get a seat!

#### April 26<sup>th</sup> - Monthly Meeting

Ronnie Fields from Premier Laboratory will be discussing potability of CT private groundwater systems, including "veins" of arsenic.

**Another bus trip is being planned for the spring time. We will let you know soon!**

(continued from page 3)

did not meet *NEC*® when performed, and certainly do not meet today's *NEC*."

"Do-it-yourselfers and less than skilled electricians can create serious code violations to the point where a lot of the work results in an accident waiting to happen," King agrees.

New residential electrical wiring systems may be inspected after initial installation, but any maintenance thereafter is often initiated by specific user problems. Managing aging wire systems is expensive and time-consuming and the inspection and testing of these systems poses a technical challenge. As the first step to addressing this issue, the National Fire Protection Association developed NFPA 73, which differs from NFPA 70 by providing requirements for evaluating existing electrical systems.

For example, electrical inspectors could make sure a residence conforms to NFPA 73 before being sold to a new owner, enabling older homes to be gradually brought up to a standard that would eliminate the most common and dangerous aging wiring system hazards.

### **Vietnam era aluminum wiring**

No discussion of the hazards posed by aging wiring would be complete without a nod toward residential aluminum wiring systems. Nationwide, between 1965 and 1974, an estimated 2 million homes and mobile homes were wired with aluminum wire. These systems consisted of aluminum electrical conductors for use in 15 and 20 ampere circuits (size 10 AWG and smaller) as well as all outlets, wall switches, circuit breakers, fuse holders, lamp holders, wire connectors, and relay switches connected to them.

In 1974, the CPSC determined that hazards associated with aluminum wire systems present "an unreasonable risk of injury or death" and later filed suit against more than two dozen manufacturers of aluminum wire and devices used in these systems.

According to a report published by the CPSC, homes wired with aluminum wire manufactured before 1972 ("old technology" aluminum wire) are 55 times more likely to have one or more connections reach Fire Hazard Conditions than is a home wired with copper. In 1972, manufacturers modified aluminum wire as well as switches and outlets to improve the performance of aluminum wired connections. "The problem with aluminum wiring is only at the connection point, the

wire itself is fine," says Alex Costantino, president of Aluminum Wire Repair Inc. (Aurora, CO).

According to Costantino, aluminum expands and contracts three times the rate of copper. "Every time the aluminum connection expands and contracts, it creates a gap that exposes the wire to air that enables the aluminum to oxidize," Costantino says.

This oxidation increases resistance and heat buildup along the circuit. "Since aluminum oxide is such a bad conductor, in some really high heat environments it acts as an insulator, potentially leading to hazardous arcs and glowing connections," he adds.

### **Protecting against arc faults**

Arc faults are a discharge of electric current across a gap. In a home, arc faults can be years or just seconds in the making. Arc faults can be caused by a variety of factors including loose or improper connections to outlets or switches; cracked wire insulation stemming from age, heat, or corrosion; and electrical wire insulation chewed by rodents or punctured by nails. When they occur inside walls or ceilings, temperatures can exceed 10,000° F and turn wood studs into kindling.

According to CPSC estimates, fire originating in electrical distribution systems accounts for more than 10 percent of all home fires. In many of these situations, an arc fault can be blamed.

Since household fuses and circuit breakers do not respond to early arcing and sparking conditions, in January 2002, the National Electrical Code (1999 NFPA 70, Section 210-12), began requiring arc fault circuit interrupters (AFCIs) for all branch circuits supplying 125V, single phase, 15- and 20-ampere outlets for bedroom circuits in new residential construction.

However, according to the CPSC, AFCIs are particularly important where wiring may have degraded with age. These complex pieces of electronic technology can identify the specific "signatures" of the current or voltage waveform that are unique to electrical arcing.

An AFCI, which prevents electrical fires beyond the capabilities of traditional fuses and circuit breakers by detecting and de-energizing unseen arcing-faults in circuits, should not be confused with a Ground Fault Circuit Interrupter (GFCI), which protects against shock. Keep in mind that fuses and circuit breakers were not designed to protect a circuit against arcing faults. These

(continued on page 6)

(continued from page 5)

devices just protect against overloads or short circuits.

"One of the dilemmas we face when talking with contractors and building owners is 'why should I pay more for safety when everything is already safe enough?' That's why there was some push-back on things like AFCIs," Mercier says.

One of the current proposals for the 2005 NFPA 70 is that whenever a residence changes out their circuit breaker or fuse box, they have to add AFCI protection for the existing branch circuits.

"This initiative has garnered some support in the process leading to the 2005 code, but it hasn't reached consensus to date," King says. "We got our foot in the door with the current code by requiring AFCI protection in bedroom circuits in new residential construction. But if AFCIs are necessary in new homes, they are more than necessary in older ones."

### **What's being done?**

The good news is that a lot has gone on over the last year to address this issue, including direct to homeowner educational campaigns and a new public/private partnership in conjunction with the NFPA's charitable Fire Protection Research Foundation.

Last May, the Electrical Safety Foundation International (ESFI; Rosslyn, Va.) began its "Inspect and Protect!" campaign that encourages homeowners to inspect wiring systems in homes 40 years and older, to learn about the potential hazards posed by aluminum wiring systems and to consider installing AFCI technology.

When announcing the program, Michael G. Clendenin, executive director of ESFI, hoped that by the conclusion of the campaign, homeowners will regard an electrical inspection by a qualified, licensed electrician as an essential part of routine home maintenance.

Additionally, the research partnership under the NFPA's Fire Protection Research Foundation includes more than a dozen organizations, such as Southwire, Leviton, Cutler-Hammer, Underwriters Laboratories (UL), State Farm Insurance and the CPSC. By pooling their combined resources and expertise, this joint effort to tackle the aging electrical wiring safety issue aims to provide new data that can assist in the development of better codes and standards.

"We will be able to address the aging wiring issue by

providing a more scientific understanding of when things should be retired, considered obsolete or on the ragged edge of their design life," King says.

The first part of this research effort is to collect electrical systems from 40, 50, and 60-year-old homes that haven't undergone major renovations and are now slated for demolition, and bring those components back to a laboratory for study. For example, is a circuit breaker from a 50-year-old home still within calibration or able to respond to a short circuit? Is the wiring from that same home brittle? Are the connections at such a high resistance that it is just an accident waiting to happen?

The second part is to work with cooperative jurisdictions to allow outside experts to examine homes where there have been electrical fires to find out the incipient cause. Was the cause a high resistance connection? Was it an over-fused fixture?

"We did this back in the 1980s, which led to NFPA 73 and AFCI development," King says. "But that was over 20 years ago. We need up-to-date data to measure where we go from here."

Articles published in the CAHI Monthly are the sole opinion of the author. CAHI does not endorse or state a position for or against the content of said articles.

# \$ 25.00 Reward

## Newsletter Article or Guest Speaker

CAHI will pay \$25.00 to any member who provides us with a guest speaker for one of our monthly meetings or for any article that is submitted and used in the monthly newsletter.

Your guest speaker's name and contact number should be given to Woody Dawson (203) 272-7400 or Barry Small (860) 655-6383 (barrysmall@yahoo.com).

Articles must be e-mailed to Rich Kobylenski (rkoblenski023@earthlink.net) and should be a PDF or Word document. Articles should pertain to our industry.

We will review articles for content and reserve the right to edit, use and/or refuse them.

### Contact CAHI

18 Garden Place  
Derby, CT 06418

E-mail: [ctinspect@yahoo.com](mailto:ctinspect@yahoo.com)

Web: [www.ctinspect.com](http://www.ctinspect.com)

#### CAHI Executive Board

<b>President</b>	<b>Bernie Caliendo</b> , Windsor (860) 285-0332
<b>Vice-President</b>	<b>Rich Kobylenski</b> , Coventry (860) 724-3272
<b>Secretary</b>	<b>Barry Small</b> , West Hartford (860) 233-6948
<b>Treasurer</b>	<b>Pete Petrino</b> , Derby (203) 732-8810
<b>Director</b>	<b>Ken Mita, Sr.</b> , Wallingford (203) 269-0341
<b>Director</b>	<b>Woody Dawson</b> , Cheshire (203) 272-7400
<b>Director</b>	<b>Dwight Uffer</b> , Hebron (800) 924-0932
<b>Director</b>	<b>Tom Hauswirth</b> , Beacon Falls (860) 526-3355

#### CT Home Inspection Licensing Board

Bernie Caliendo, Chairman	CAHI
Rich Kobylenski	CAHI
Dana Fox	CAHI
Bruce Schaefer	ASHI
William Stanley	ASHI
Susan A. Connors	Attorney
J. Andre Fornier	Realtor

The Licensing Board meetings are held at 9:30 am,  
Department of Consumer Protection, Room 117, 165 Capitol  
Avenue, Hartford.

*The public is always welcome.*

E-mail Bernie Caliendo for the latest meeting schedule at  
[bsurehomeinspect@juno.com](mailto:bsurehomeinspect@juno.com)

**Artemis**  
Publications

[Artemis13@bigfoot.com](mailto:Artemis13@bigfoot.com)