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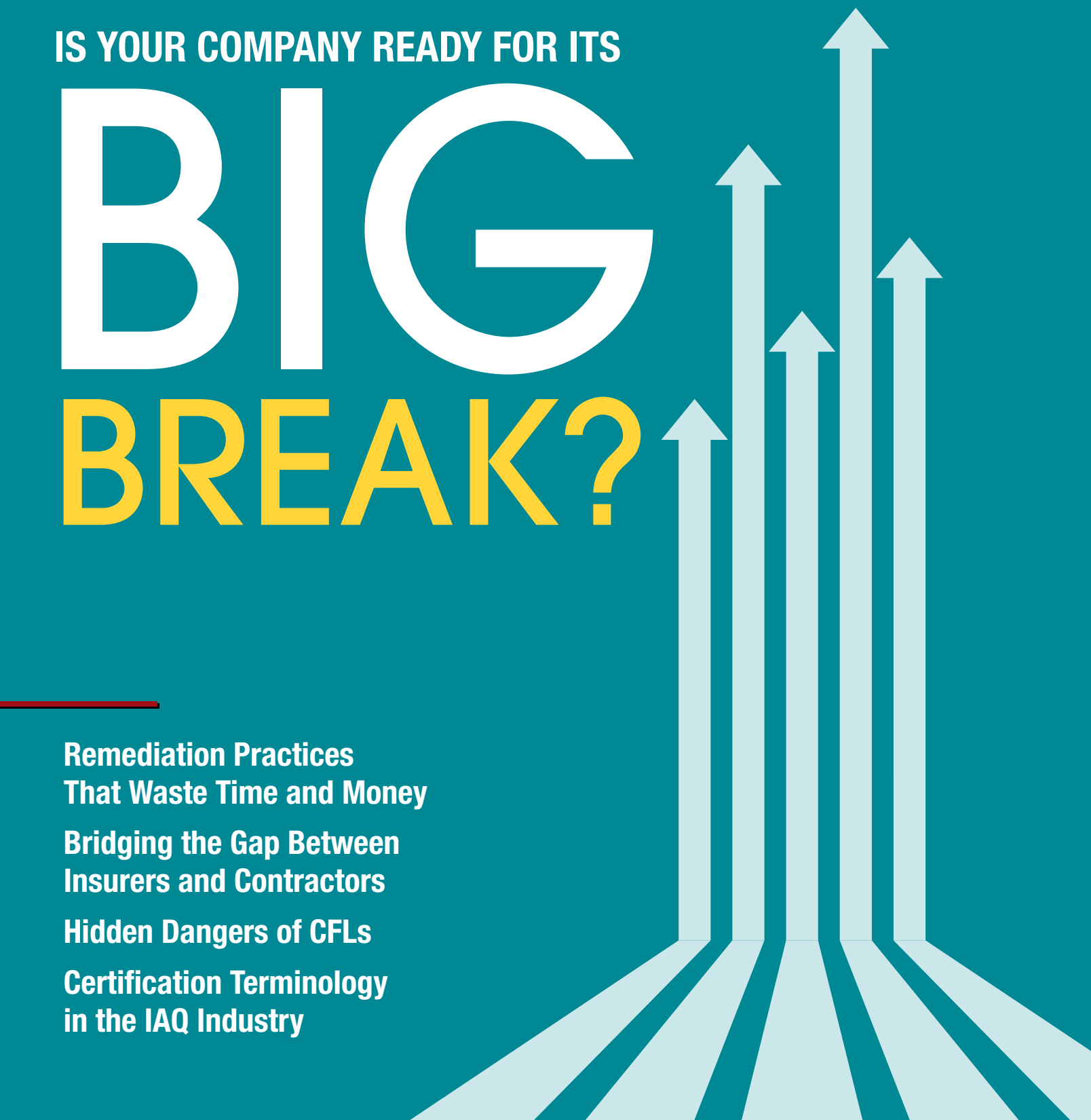
IS YOUR COMPANY READY FOR ITS

BIG BREAK?



Remediation Practices That Waste Time and Money

Bridging the Gap Between Insurers and Contractors

Hidden Dangers of CFLs

Certification Terminology in the IAQ Industry

By Michael A. Pinto, CSP, CMP

The Hidden Hazards of Compact Fluorescent Lights–Part 1

Generally, this column deals with "big picture" issues related to cleaning and restoration contractors, so some readers may be thinking, "What do compact fluorescent lights (CFLs) have to do with our industry?" Cleaning and restoration contractors are increasingly called on to diagnose and resolve health hazards from a variety of environmental concerns, including mold, sewage, infectious agents, soot/smoke and chemicals.

In addition, restoration contractors rebuild damaged homes and commercial buildings to a pre-loss condition. In doing so, they make many recommendations and choices about the products used in restored structures. CFLs are commonly recommended and installed, yet pose dangers to both cleaning and restoration work crews and building occupants. As leaders in our industry, it is imperative that we clearly understand the risks.

A Brief Primer

Because of the emphasis over the last few years on switching from incandescent bulbs to CFLs for energy efficiency, most individuals are familiar with the twisty tube shape of the bulbs. CFLs are an advancement of the traditional fluorescent lights that have been used in commercial structures since the 1940s. The standard fluorescent light has a separate ballast that controls the energy provided to the bulb(s) in that fixture. The CFL combines the ballast and bulb into one piece by substituting electronic controls at the base of the bulb for a traditional ballast. As such, CFLs can be screwed into standard light sockets that are not wired to a ballast.

The chief advantage of fluorescent bulbs, whether traditional or compact fluorescent, is that the lights burn cooler and use less electricity than incandescent bulbs to produce the same amount of light. Still, they have several drawbacks, including a higher upfront cost for each bulb, a warm-up time to get to full intensity, and difficulty of operation in cold temperatures.

However, CFLs have some drawbacks even when compared to the traditional fluorescent tubes. The control mechanism on many CFLs must have a steady power source to operate properly and, therefore, cannot be used with dimmer switches. Improper replacement of standard bulbs with CFL bulbs in lights with dimmer switches has already been documented as the source of a number of serious fires. Consider the irony, as well as the liability, of a restoration company that specializes in putting burned buildings back together installing the bulb and switch combination that then led to a serious fire.

The electronic control at the base the bulb is designed for a certain number of on/off cycles, so the lifespan of a CFL may be reduced by up to 85 percent if it is switched off and on frequently. This makes them a poor choice for fixtures that are controlled by motion sensors. Even something as simple as the position of the bulb can have a significant impact. Screwing a CFL into a ceiling socket, particularly a can light with limited air circulation, will dramatically reduce its lifespan as the heat from the bulb rises and damages electronics in the base.

The Danger From Broken Bulbs

Of primary concern to the cleaning and restoration contractor is that all fluorescent bulbs have some level of mercury in them. Even green-tipped bulbs that are considered to be ecologically friendly have mercury. It's just a smaller amount than the traditional bulbs. In commercial fluorescent tubes, the mercury content ranges from 3.5 to 4 mg per tube for a low-mercury bulb compared to a standard fluorescent bulb with 8 to 14 mg of mercury per tube.

Despite their smaller size, CFLs can contain mercury levels as high as 18 mg per tube, although the average is around 5 mgs. Currently, the lowest recorded level is 0.9 mg of mercury per CFL tube.

The mercury in a fluorescent bulb can be released as both dust and vapor if the light is broken. This heavy metal is dangerous to people and animals and easily migrates through the environment in the air, water and soil. Mercury is persistent in the food chain and bioaccumulates in living organisms, meaning that its toxicity level increases as it moves up through the food chain.

Numerous media outlets have reported on data taken from a Stanford University research report that indicates that the amount of mercury in one standard CFL "is enough to contaminate up to 6,000 gallons of water beyond safe drinking levels." A separate EPA-funded study found that improper disposal of 200 average CFLs (at 5 mg of mercury each) or 71 standard commercial fluorescent tubes (at 14 mg of mercury each) deposited in a 20-acre lake is enough to contaminate the fish and make them unfit to eat.

Breaking the bulbs inside buildings where there is less dilution from outside air makes the situation worse.

Measurements have consistently shown that breaking a single CFL bulb in an average sized bedroom can result in mercury vapor levels 300 times higher than the EPA's recommended long-term exposure level. Although the mercury level will dissipate over time, carpeting acts as a trap for the contaminant. This was confirmed by a study conducted by the Maine Department of Environmental Protection, which noted that despite following EPA cleanup guidelines, their researchers were unable to remove mercury from carpet.

Even more sobering was their assessment that later agitation of the carpet, such as by young children playing, created hazardous localized concentrations of mercury in the air close to the carpet—even weeks after the initial breakage.

Proper Cleaning Techniques

These studies on the difficulty of removing residue from broken fluorescent bulbs should give cleaning and restoration contractors pause. Accidental breakage of a fluorescent light, whether a standard tube in a commercial building or a CFL in a house, requires a response from your crew well beyond a broom and dustpan. At a minimum, professional restoration contractors should be following the EPA guidelines for cleaning up broken fluorescent bulbs.

Even when utilizing cleaning methods that are not available to the typical homeowner, such as HEPA vacuums and truck-mounted hot water extraction systems, the cleanup of broken fluorescent bulbs poses a dilemma for contractors in regard to the use of personal protective equipment. It is important to remember that an N-100 filtering face piece, which is so common for work in the cleaning and restoration industry, would not be adequate protection for cleaning up fluorescent bulbs. Because the bulb residue is a serious contaminant for people and the environment, I recommend that contractors require the use of suits and respirators for such cleanups. Special respirator filters are necessary to trap mercury vapor. RIA

Michael Pinto, CSP, CMP, is the CEO of Wonder Makers Environmental, Inc. He has more than 30 years of safety and environmental experience from jobs in the private sector, the non-profit arena, and regulatory agencies. Pinto is the author of five textbooks and more than 150 published articles. He can be reached at map@wondermakers.com.

> *"Breaking a single CFL bulb in an average sized bedroom can result in mercury vapor levels 300 times higher than the EPA's recommended long-term exposure level."*

THE EPA HAS PRODUCED A DETAILED, THREE-PAGE SET OF RECOMMENDATIONS FOR THE CLEANUP OF FLUORESCENT BULBS, WHICH WAS UPDATED IN JANUARY 2011.

That document is designed for homeowners, but its focus makes it even more important for contractors. Think of the potential liability if a professional cleaning or restoration contractor broke a fluorescent bulb during a job and then did not follow the EPA cleanup recommendations to which even nonprofessionals are supposed to adhere. So what does the EPA advise for cleaning up broken CFL bulbs? Its latest recommendations include:

- evacuating the area
- isolating the room where the breakage occurred and shutting off the HVAC system
- opening windows and leaving them open for several hours after the cleanup as well as opening them and leaving them open during subsequent regular cleaning of the same area
- throwing away any clothes or bedding that have come in direct contact with the mercury from the bulb as attempts at laundering just spread the contamination
- scooping up as much debris as possible using cardboard or duct tape
- sealing glass fragments and dust in a glass jar with a tight-fitting lid
- wiping with a damp cloth in lieu of vacuuming unless a vacuum is absolutely necessary to pick up residual pieces of glass
- throwing away the vacuum bag after cleaning the area, and continuing to replace the bag "the next several times" the area where the breakage occurred is vacuumed
- confirming that all debris, vacuum bags, etc., are properly recycled as required by federal and state regulations

The full document can be viewed at *http://epa.gov/cfl/cflcleanup.pdf.*

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