{Property}

Aging Electrical Systems

fire

Introduction

While there are many building components that can cause considerable damage when they fail, nothing is as dangerous as a failure to the electrical system. Malfunctioning devices and aging wiring can cause fire, electrocution, and even death under certain circumstances. The threat of fire is even more significant in multifamily housing because a fire in one unit can quickly spread to other units.

Statistics compiled by the National Fire Protection Association (NFPA) reveal that the electrical distribution system in homes continues to be a leading cause of residential building fires each year. A home's electrical system, like other utilities, will deteriorate with age and eventually require repair or replacement.

A homeowner's general perception is that if the lights work and the vacuum runs then everything is fine, but this can be a disastrous mistake in an older home. Residential electrical systems over 30 years old may contain hidden hazards that require professional inspection and repair.

The following warning signs may indicate possible electrical problems. Contact a licensed electrician to inspect the electrical system and make necessary repairs if any of these warning signs are evident:

- Flickering or dimming lights
- Switches or outlets are hot to the touch or emit an acrid odor
- Cords, outlets or switch plates are discolored
- Frequent blown fuses or tripped circuit breakers
- GFCI outlets will not reset
- Electronic equipment and computers shutting off unexpectedly

The primary concerns with electrical systems over 30 years old include obsolete wiring and electric panels.

What CAU Recommends:

Many associations believe that electrical upgrades are the responsibility of the unit owner. While this may be the case with your association, depending on the language contained in the governing documents, the association still has a vested interest in electrical upgrades because an electrical fire will likely trigger coverage under the association master policy. At a minimum, associations should consider the following:

> Have a licensed electrician inspect electrical systems more than 30 years old

> Establish a plan and funding to replace old and obsolete electrical wiring

> Establish a plan and funding to replace obsolete electric panels

> Do not use power strips to provide additional outlets

> Use the proper wattage light bulbs

Need More Information?

Additional information on aging electrical systems is available through several sources including Underwriters Laboratories (www.ul.com), The National Fire Protection Association (www.nfpa.org), Electrical Safety Foundation International (www.esfi.org) and your local electric supplier. Associations may also request additional information on this topic by contacting CAU's Loss Control Department.

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Obsolete Wiring

According to Underwriters Laboratories (UL), most residential electrical systems are only inspected during the time of installation. While receptacles and switches are readily accessible and easily replaced when broken, the electrical wiring remains unseen and untouched.

Electrical wiring and wire insulation will deteriorate over time and can become cracked, brittle, or covered with oxidation that can cause circuits to overheat.

Subsequent modifications to the original circuits and overloading by the homeowner can increase the risk of electrical failure. This risk is increased in older homes where circuit capacity may not meet the requirements of today's lifestyle.

By today's standards, knob and tube wiring and aluminum wiring in branch circuits are obsolete.

Knob and tube wiring is one of the oldest wiring methods and was common in homes until the 1930's. This wiring method involves separating two conductors in air by using ceramic knobs and tubes to mount the wire. The cloth insulation commonly used is more prone to deteriorate and cannot withstand high temperatures from increased loads like modern wiring with PVC insulation. There is no ground wire so you cannot use modern electrical switches and outlets safely.

Aluminum wiring was a common substitute for copper wiring in homes built between 1965 and 1973. Aluminum wiring was deemed unsafe after patterns of failures at splices and connection points developed. Many electrical professionals feel that the useful service life of aluminum wire is approximately 30 years.

Consumer Product Safety Commission (CPSC) research shows that a home with aluminum branch circuits installed before 1973 is 55 times more likely to have a connection reach "Fire Hazard Conditions" than is a home wired with copper.

The CPSC recognizes two permanent repairs for aluminum wired branch circuits; rewiring the home with copper wiring and the COPALUM crimping repair. Both methods are costly repairs with their own disadvantages.

The COPALUM repair is effective only if an electrician completes the repair for ALL connections in the home and the repairs remain in place. In many homes, there may be unknown connections in concealed spaces that are not accessible. Another problem is the possibility that unit owners can remove the repairs later during renovations.

Considering that knob & tube and aluminum wiring are at or beyond their useful service life, rewiring the home is the preferred method of repair to ensure that the electrical system is safe

Obsolete Electric Panels

Many residential electrical systems used fuse panels as over current protection until the early 1960's. Like obsolete wiring, these panels are beyond their useful service life and need to be replaced. Many fuse panels have a 30 or 60 amp capacity meaning that they have two or four, 15 amp circuits, not nearly enough capacity for the electrical load in a home today. As more appliances and electronic devices are used in the home, the higher the probability for an overload condition.

Aside from their age, the major problems associated with fuse panels are over fusing and bypassing the fuses. In older fuse panels, a resident could easily insert a higher amperage fuse or insert a piece of metal in the socket to avoid constantly replacing blown fuses. Though changes in the socket design and tamper proof fuses will generally prevent this from happening today, fuses are still considered obsolete protection and should be upgraded to circuit breakers.

Circuit breakers gained popularity through the 1940's and 1950's and became the standard in new residential construction in the early 1960's. As with many other technologies, electrical engineers developed better overload protection systems and panels over time. The circuit breaker panels installed through the late 1970's are now over thirty years old and considered obsolete. There are also reports that some of these panels may fail to trip when overloaded or fail to drop power when a breaker is turned off. Both of these conditions can result in a fire or electrocution.