Commercial Property Insights

Aging Buildings - Electrical Systems

As the exterior and interior components of a building begin to wear, aging systems can fail, including electrical systems. Electrical systems must be well-maintained, otherwise they can become severe hazards to buildings and their inhabitants. The risks of allowing an electrical system to deteriorate include fires—which, according to the Federal Emergency Management Agency, caused nonresidential buildings losses of $2.7 billion in 2017—and bodily harm due to electrocution.

Recognizing Issues

It's estimated that 90% of a building's electrical system is hidden behind walls, meaning it's easy for issues to go unnoticed until it's too late. The following are electrical system issues facilities managers should recognize:

- Flickering lights or lights that dim when major appliances are running
- Hot spots—light switches, outlets or electrical panels, that are hot to the touch
- Repeatedly tripped circuit breakers and blown fuses
- Dysfunctional outlets
- Burning smells, which may indicate melting wire insulation

Facilities managers should be on top of updating and maintaining electrical systems before such problems arise.

Why Failures Can Happen

Poorly maintained electrical systems could be both costly and deadly. Many factors contribute to the failure of aging electrical systems, including:

- **Outdated components**—As technology advances, previously standard parts may no longer be acceptable. These can include:
  - *Knob and tube wiring*—Knob and tube wiring was an early standardized method of electrical wiring consisting of single-insulated copper conductors. The insulation breakdown on knob and tube wiring frequently results from overheating or mechanical abuse.
  - *Aluminum wiring*—Aluminum wiring was used from the mid-1960s to the mid-1970s when copper prices were high. Unfortunately, the U.S. Consumer Product Safety Commission has since reported that aluminum wiring is 55 times more likely to create "fire hazard conditions" than copper.
  - *Old panels*—While old electrical panels—like the Federal Pacific Electric Company panels of the 1950s—aren't common, they still exist and can rust and break down over time. When this occurs, they no longer prevent surges, which can cause the components to melt, leading to sparks and potential fires.
- **Worn out components**—While each insurance carrier may have its own underwriting guidelines, a building's electrical system is typically considered aged after 25 to 30 years. It's around that time the components within the system begin to wear out and no longer work as well as they once did.

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- **Changes in a building's electrical needs**—Should the purpose of a building change, electrical systems may no longer be adequate. For example, if the building is now occupied by an owner in a different industry than initially designed and intended, electrical needs may be more advanced. Or, the occupant may remain the same but have evolving electrical needs that the system no longer meets.
- **Lack of upkeep**—Since electrical systems are primarily within the walls of a building, it's possible that whomever has been maintaining the system hasn't been doing so up to code. If a facilities manager has been getting by with temporary fixes, it's time to invest in proper solutions before it's too late

Risk Management Actions

Many of the issues that result from faulty electrical systems can be prevented by periodic electrical inspections and maintenance. It is also imperative that older buildings be retrofitted to replace old and unsafe wiring with more modern elements. Preventive actions include:

- **Conducting system inspections**—Electrical systems should be inspected and tested by a professional, licensed electrician every three to five years. These routine inspections can help to minimize the occurrence of unexpected shutdowns.
- **Utilizing infrared thermography**—This imaging can detect hot spots and dirty, loose, oxidized or corroded connections. It is also capable of finding phase-imbalance problems and undersized-wiring problems. Identifying and fixing these exposures can help reduce energy bills, maximize equipment availability and maintain a safe environment. While small businesses may hire out this role, larger companies may want to invest in their own qualified person on staff.
- **Hiring licensed electricians**—When the electrical system needs an upgrade, only use licensed electricians. For a system to be considered "updated" or "upgraded," it must meet current codes for the present occupancies. The building owner should always thoroughly document any upgrades that are completed.

Investing in the proper resources can help ensure that a building's electrical system doesn't compromise the integrity and safety of the building and its inhabitants.

For more risk management guidance, contact us today.