

Introduction: Electrical fires

Electricity is a common cause of fires in buildings and not all risks—including insulation based fires and loose connections—are addressed by overcurrent protection.



To understand the impact electrical fires can cause, consider these global statistics:

- According to the [International Association of Fire and Rescue Services](#) (CTIF), 35% of fires in the world that require firefighter intervention, start in buildings.
- Organizations such as the [European Fire Academy](#) (EFA), and property and insurance companies that track building damages, declared that 25% of building fires are electrical in origin.
- [AXA Insurance](#) has also found that half of all organizations that suffer a fire will close within the next five years.
- In the U.S., according to the U.S. Fire Association (USFA) ~10% of fires in nonresidential buildings are directly caused by electricity (15% in educational, 19% in retail or offices, 16.5% in basic industry). This number grows to 30% if we include overheated electrical loads in industrial segments.
- According to the [German Insurance Association](#), 31.7% of fires in Germany are caused by electricity.
- 56% of industrial disasters in India are due to electrical faults.

Examples of debilitating electrical fires include:

- Paris's Montparnasse train station in 2018 ([France 24 article](#))
- Atlanta's Hartsfield-Jackson airport in 2017 ([Electrical Contractor article](#))
- Rome's Fiumicino airport in 2015 ([ABC's article](#))

INTRODUCTION: ELECTRICAL FIRES

Electrical fires can generate huge losses in commercial buildings from the loss of business continuity, business opportunity costs, assets, and production loss. These losses can be so significant that they can even destroy companies.

If an electrical design follows requirements, including IEC standards and national regulations, and uses compliant equipment, the electrical fire risks from over-current, over-voltages and overheating of electrical appliances should be reduced. **However, electrical installations can deteriorate with time**, often due to environmental factors, such as heat and humidity. Additionally, damage can occur during use or as a result of corrosive chemical reactions.

This Guide considers the risk of fire caused by electrical currents that fall below overcurrent protection thresholds.

It focuses on the latest solutions to help mitigate such hazards in both new and existing installations. Even professionally designed installations can be exposed to electrical fire risks. Figure 1.1 illustrates risk areas and causes, even for installations which have followed the standards.

Areas of fire risks

Chapter 1 - LV main, secondary and control switchboards

- IP level, insulation distances and heat dissipation issues
- Power connection issues

Chapter 2 - Power and distribution circuits

- Conductor insulation failures
- Connection issues (derivation box)

Chapter 3 - Final distribution boards and circuits

- Conductor insulation failures
- Arc faults
- Power connection issues (wiring devices)

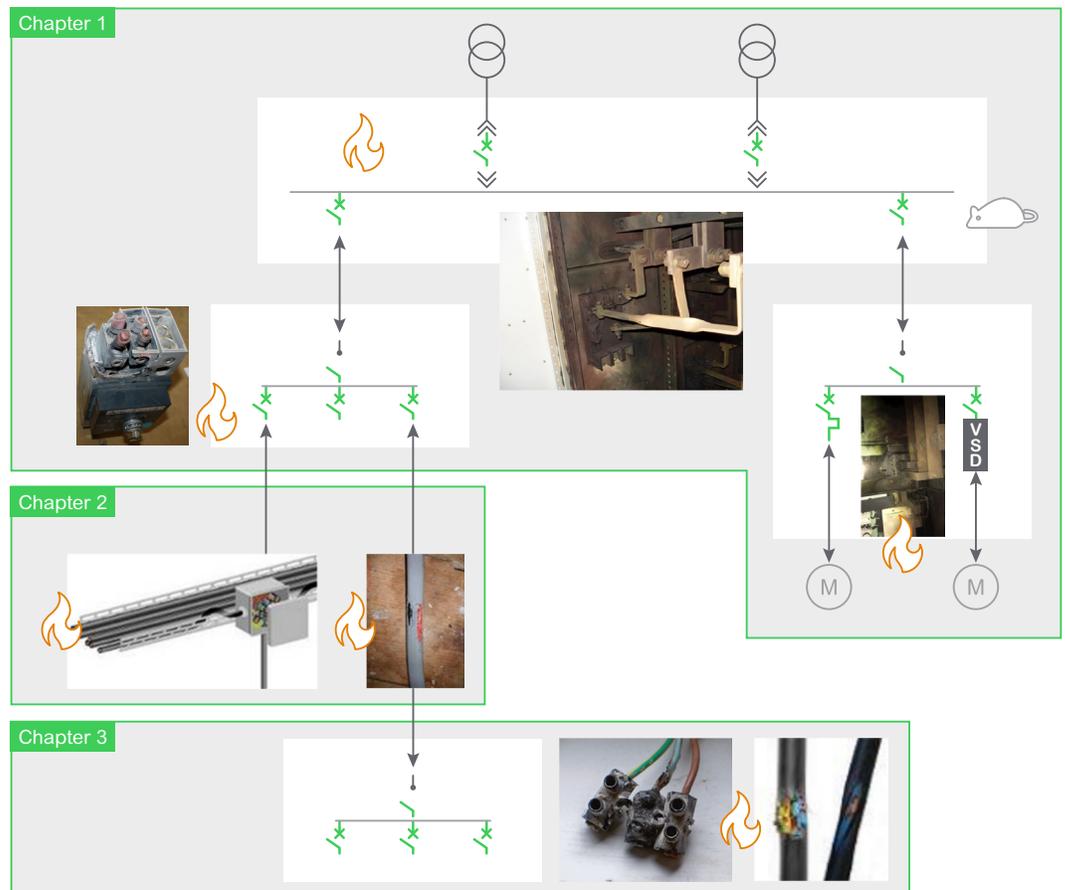


Figure 1.1. Risk areas and causes