

# UNIT 26

## GFCIs, GFPEs, AFCIs, AND SPDs

### 26.1 Introduction

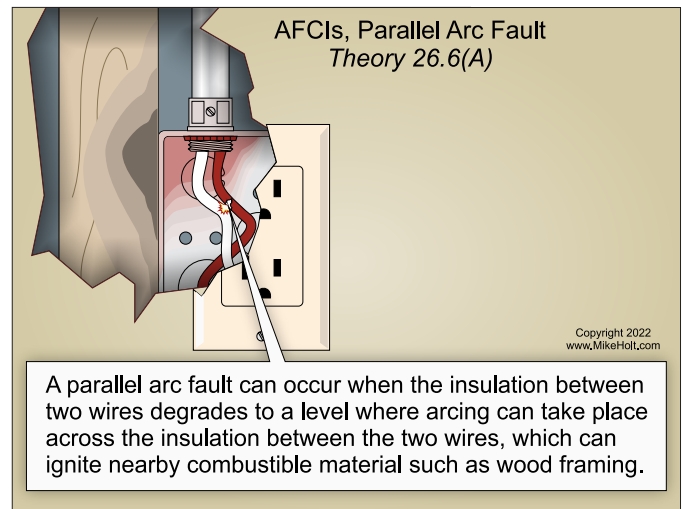
In addition to overcurrent protection of electrical circuits, electronic devices with the technology to protect against electric shock and fire are used in the electrical system. In this unit you will learn:

- ▶ what a ground-fault circuit interrupter is
- ▶ what an arc-fault circuit interrupter is
- ▶ what ground-fault protection of equipment is
- ▶ what a surge protective device is

### 26.6 Clearing Arcing Faults

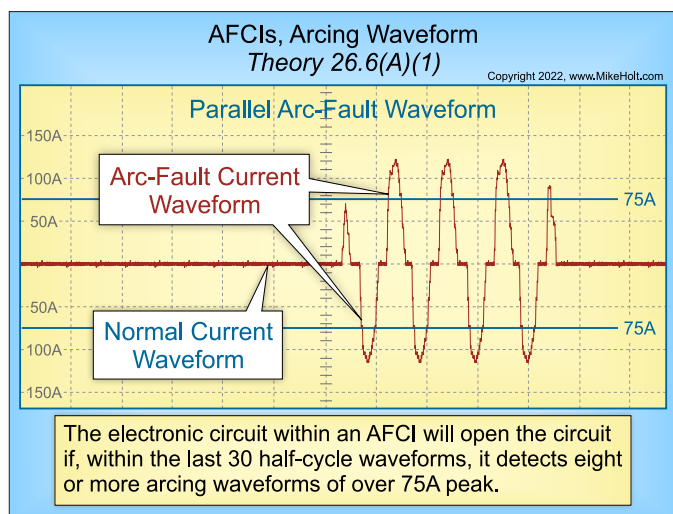
**(A) Parallel Arcing Fault.** A parallel arcing fault can occur when the insulation between two wires degrades to a level where arcing can take place across the insulation between the wires. An arc fault between wires can create heat at the point of the arc, which can ignite nearby combustible material such as wood framing. ▶Figure 26-11

**(1) Arcing Waveform.** The current in an arcing fault is limited by the system impedance and the impedance of the arcing fault itself. Typically, at a receptacle, fault current will be above 75A, but not likely above 450A. The electronic circuit within the AFCI will open the circuit if, within the last 30 half-cycle waveforms, it detects eight or more arcing waveforms of over 75A peak. ▶Figure 26-12



▶Figure 26-11

**(B) Series Arcing Fault Current.** A series arcing fault occurs when the wire within a cord is unintentionally broken, causing the current to arc across the gap in the wire. Series arc-fault current is load limited and the electronic circuit within the AFCI will open the circuit if the device detects a series arcing current of 5A or more.



►Figure 26-12