



Chapter 1 General :: ARTICLE 100 Definitions

I. General **See related ROC**

Accessible (as applied to equipment). Admitting close approach; not guarded by locked doors, elevation, or other effective means.

Exhibit 100.1 illustrates examples of equipment considered accessible (as applied to equipment) in accordance with requirements elsewhere in the *Code*. The main rule for switches and circuit breakers used as switches is shown in (a) and is according to **404.8(A)**. In (b), the busway installation is according to **368.17(C)**. The exceptions to **404.8(A)** are illustrated in (c), busway switches installed according to Exception No. 1; in (d), a switch installed adjacent to a motor according to Exception No. 2; and in (e), a hookstick-operated isolating switch installed according to Exception No. 3.

Exhibit 100.1 Example of a busway and of switches considered accessible even if located above the 6 ft 7 in. maximum height of the switch handle, which is specified in 404.8(A).

Accessible (as applied to wiring methods). Capable of being removed or exposed without damaging the building structure or finish or not permanently closed in by the structure or finish of the building.

Wiring methods located behind removable panels designed to allow access are not considered permanently enclosed and are considered exposed as applied to wiring methods. See **300.4(C)** regarding cables located in spaces behind accessible panels. **Exhibit 100.2** illustrates an example of wiring methods and equipment that are considered accessible despite being located above a suspended ceiling.

Exhibit 100.2 Example of an accessible busway and junction box located above hung ceilings having lift-out panels.

Accessible, Readily (Readily Accessible). Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, and so forth. *See related* **ROC**

The definition of *readily accessible* does not preclude the use of a locked door for service equipment or rooms containing service equipment, provided those for whom ready access is necessary have a key (or lock combination) available. Sections **230.70(A)(1)** and **230.205(A)** require service-disconnecting means to be readily accessible. However, **230.205(A)** permits overhead or underground primary distribution systems on services of over 600 volts, nominal on private property to have a disconnecting means that is not readily accessible provided that there is a readily accessible means to operate the disconnecting means through a mechanical linkage or through an electronically actuated means.

Section **225.32** requires that feeder disconnecting means for separate buildings be readily accessible. A commonly used, permitted practice is to locate the disconnecting means in the electrical equipment room of an office building or large apartment building and to keep the door to that room locked to prevent access by unauthorized persons. Section **240.24(A)** requires that overcurrent devices be so located as to be readily accessible. **Exhibit 100.3** shows an example of a locked electrical equipment door with a warning sign that restricts access.

Exhibit 100.3 Warning on locked electrical equipment door.

Ampacity. The maximum current, in amperes, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

Changed From 2008

- 100 Ampacity: Revised to indicate it is the maximum current that can be carried continuously.

The definition of the term *ampacity* states that the maximum current a conductor carries continuously varies with the conditions of use as well as with the temperature rating of the conductor insulation. For example, ambient temperature is a condition of use. A conductor with insulation rated at 60°C and installed near a furnace where the ambient temperature is continuously maintained at 60°C has no current-carrying capacity. Any current flowing through the conductor will raise its temperature above the 60°C insulation rating. Therefore, the ampacity of this conductor, regardless of its size, is zero. See the ampacity correction factors for temperature in **Tables 310.15(B)(2)(a)** and **310.15(B)(2)(b)** or see Informative Annex B. The temperature limitation on conductors is further explained, and examples are given in **310.15(B)(2)** and in the commentary following that section. Another condition of use is the number of conductors in a raceway or cable. [See **310.15(B)(3)(a)**.]

Appliance. Utilization equipment, generally other than industrial, that is normally built in standardized sizes or types and is installed or connected as a unit to perform one or more functions such as clothes washing, air conditioning, food mixing, deep frying, and so forth.

Approved. Acceptable to the authority having jurisdiction.

See the definition of *authority having jurisdiction* and **110.2** for a better understanding of the approval process. Typically, approval of listed equipment will more readily be given by an authority having jurisdiction where the authority accepts the laboratory's listing mark. Other options may be available for the jurisdiction to approve equipment, including evaluation by the inspection authority or field evaluation by a qualified laboratory or individual. Where an evaluation is conducted on site, industry standards such as NFPA 79, *Electrical Standard for Industrial Machinery* (if applicable), can be used.

Arc-Fault Circuit Interrupter (AFCI). A device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.

Changed From 2008

- 100 Arc-Fault Circuit Interrupter (AFCI): Relocated from Article 210 to Article 100.

The basic objective of an arc-fault circuit interrupter is to de-energize the branch circuit when an arc fault is detected. Arc-fault circuit interrupters are evaluated in UL 1699, *Standard for Arc-Fault Circuit-Interrupters*, using testing methods that create or simulate arcing conditions to determine a product's ability to detect and interrupt arcing faults. These devices are also tested to verify that arc detection is not unduly inhibited by the presence of loads and circuit characteristics that may mask the hazardous arcing condition. In addition, these devices are evaluated to determine resistance to unwanted tripping due to the presence of arcing that occurs in control and utilization equipment under normal operating conditions or to a loading condition that closely mimics an arcing fault, such as a solid-state electronic ballast or a dimmed load.

Askarel. A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions, the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases, depending on the askarel type. *See related* **ROP ROC**

Attachment Plug (Plug Cap) (Plug). A device that, by insertion in a receptacle, establishes a connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

Standard attachment caps are available with built-in options, such as switching, fuses, or even ground-fault circuit interrupter (GFCI) protection. Attachment plug contact blades have specific shapes, sizes, and configurations so that a receptacle or cord connector will not accept an attachment plug of a voltage or current rating different from that for which the device is intended. See **406.7** for requirements pertaining to attachment plugs and the configuration charts from NEMA WD 6, *Wiring Devices — Dimensional Requirements*, for general-purpose nonlocking and specific-purpose locking plugs and receptacles shown in **Exhibit 406.3**.

Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

Informational Note: The phrase “authority having jurisdiction,” or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

The important role of the authority having jurisdiction (AHJ) cannot be overstated in the current North American safety system. The basic role of the AHJ is to verify that an installation complies with the *Code*. See also the definition of *approved*, **90.7**, and **110.2**.

Automatic. Performing a function without the necessity of human intervention.

Bathroom. An area including a basin with one or more of the following: a toilet, a urinal, a tub, a shower, a bidet, or similar plumbing fixtures.

Changed From 2008

- 100 Bathroom: Expanded by adding additional plumbing fixtures which, in combination with a basin, constitute a bathroom.

Bonded (Bonding). Connected to establish electrical continuity and conductivity.

Bonding, which establishes an effective path for fault current that, in turn, facilitates the operation of the overcurrent protective device, is treated in the requirements of **250.4(A)(3)** and **(4)** and **250.4(B)(3)** and **(4)**. Specific bonding requirements are found in Part V of Article **250** and in other sections of the *Code* as referenced in **250.3**.

Bonding Conductor or Jumper. A reliable conductor to ensure the required electrical conductivity between metal parts required to be electrically connected.

Changed From 2008

- 100 Bonding Conductor or Jumper: The word “conductor” was added to correlate with use of the terms, “bonding jumper” and “bonding conductor” in Article 250 and other places in the code.

The term *bonding jumper* was revised to *bonding conductor or jumper* for the 2011 *Code*. Either of the two terms *bonding conductor* or *bonding jumper* may be used. The term *bonding jumper* may be interpreted to imply a short conductor. However, some bonding jumpers may be several feet in length. The primary purpose of a bonding conductor or jumper is to ensure electrical conductivity between two conductive bodies, such as between a box and a metal raceway. Bonding jumpers are particularly important where a box has either concentric- or eccentric-type knockouts. These knockouts can impair the electrical conductivity between metal parts and may actually introduce unnecessary impedance into the grounding path. Bonding jumpers may be found at service equipment [**250.92(B)**], equipment operating over 250 volts (**250.97**), and expansion fittings in metal raceways (**250.98**). **Exhibit 100.4** shows the difference between concentric- and eccentric-type knockouts. **Exhibit 100.4** also illustrates one method of applying bonding jumpers at these types of knockouts.

Exhibit 100.4 Bonding jumpers installed around concentric or eccentric knockouts.

Bonding Jumper, Equipment. The connection between two or more portions of the equipment grounding conductor.

The main purpose of equipment bonding jumpers is to ensure that the electrical continuity of an effective ground-fault current path is not compromised by an interruption in mechanical or

electrical continuity. For example, conduits entering an open-bottom switchboard are usually not mechanically connected to the switchboard. Bonding jumpers provide electrical continuity. An example of potential loss of both mechanical and electrical continuity would be an installation of an expansion fitting intended to allow for movement in a metal conduit system, as illustrated in **Exhibit 100.5**. Expansion fittings consist of loosely joined raceways that allow expansion without deformation of the raceway. Some expansion fittings for metal conduit have an internal bonding jumper that is integral to the fitting, eliminating the need for the external bonding jumpers shown in **Exhibit 100.5**. Equipment bonding jumpers are also used to connect the grounding terminal of a receptacle to a metal box that in turn is grounded via an equipment grounding conductor (the raceway system).

Exhibit 100.5 Equipment bonding jumpers installed to maintain electrical continuity around conduit expansion fittings. (Courtesy of the International Association of Electrical Inspectors)

Bonding Jumper, Main. The connection between the grounded circuit conductor and the equipment grounding conductor at the service.

Exhibit 100.6 shows a main bonding jumper that provides the connection between the grounded service conductor and the equipment grounding conductor at the service. Bonding jumpers may be located throughout the electrical system, but a main bonding jumper is located only at the service. Main bonding jumper requirements are found in **250.28**.

Exhibit 100.6 A main bonding jumper installed at the service between the grounded service conductor and the equipment grounding conductor.

Bonding Jumper, System. The connection between the grounded circuit conductor and the supply-side bonding jumper, or the equipment grounding conductor, or both, at a separately derived system.

Changed From 2008

- 100 Bonding Jumper, System: Relocated from Article 250 and revised to clarify the function of the bonding jumper by adding a reference to the supply-side bonding jumper.

This definition was revised for the 2011 *Code* to clarify the function of the system bonding jumper. The system bonding jumper can be installed in several ways. For example, if a multi-barrel lug is connected to the XO terminal of a transformer, the system bonding jumper, grounding electrode conductor, grounded conductor, and bonding jumper can be connected at that connector. If a multi-barrel lug is connected to the transformer or generator enclosure, it is common to connect the system bonding jumper, grounding electrode conductor and the bonding jumper or conductor to that connector. The grounded conductor should always connect directly to the XO terminal. A system bonding jumper is used to connect the equipment grounding conductor(s) or the supply side bonding jumper to the grounded conductor of a separately derived system either at the source (see **Exhibit 250.13**) or at the first system disconnecting means (see **Exhibit 250.14**). A system bonding jumper is used at the derived system if the derived system contains a grounded conductor. Like the main bonding jumper at the service equipment, the system bonding jumper provides the necessary link between the equipment grounding conductors and the system grounded conductor in order to establish an effective path for ground-fault current to return to the source. The requirements for system bonding jumper(s) are found in **250.30(A)(1)**.

Branch Circuit. The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

Exhibit 100.7 shows the difference between branch circuits and feeders. Conductors between the overcurrent devices in the panelboards and the duplex receptacles are branch-circuit conductors. Conductors between the service equipment or source of separately derived systems and the panelboards are feeders.

Exhibit 100.7 Feeder (circuits) and branch circuits.

Branch Circuit, Appliance. A branch circuit that supplies energy to one or more outlets to which appliances are to be connected and that has no permanently connected luminaires that are not a part of an appliance.

Two or more 20-ampere small-appliance branch circuits are required by **210.11(C)(1)** for dwelling units. Section **210.52(B)(1)** requires that these circuits supply receptacle outlets located in such rooms as the kitchen, pantry, and so on. These small-appliance branch circuits are not permitted to supply other outlets or permanently connected luminaires. (See **210.52** for exact details.)

Branch Circuit, General-Purpose. A branch circuit that supplies two or more receptacles or outlets for lighting and appliances.

Branch Circuit, Individual. A branch circuit that supplies only one utilization equipment.

Exhibit 100.8 illustrates an individual branch circuit with a single receptacle for connection of one piece of utilization equipment (e.g., one dryer, one range, one space heater, one motor). See **210.23** regarding permissible loads for individual branch circuits, as well as **210.21(B)(1)**, which requires the single receptacle to have an ampere rating not less than that of the branch circuit. A branch circuit supplying one duplex receptacle that supplies two cord-and-plug-connected appliances or similar equipment is not an individual branch circuit.

Exhibit 100.8 An individual branch circuit, supplying only one piece of utilization equipment via a single receptacle.

Branch Circuit, Multiwire. A branch circuit that consists of two or more ungrounded conductors that have a voltage between them, and a grounded conductor that has equal voltage between it and each ungrounded conductor of the circuit and that is connected to the neutral or grounded conductor of the system.

See **210.4**, **240.15(B)(1)**, and **300.13(B)** for specific information about multiwire branch circuits.

Building. A structure that stands alone or that is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

A building is generally considered to be a roofed or walled structure that may be used or intended for supporting or sheltering any use or occupancy. However, it may also be a separate structure such as a pole, billboard sign, or water tower. Definitions of the terms *fire walls* and *fire doors* are the responsibility of building codes. Generically, a fire wall may be defined as a wall that separates buildings or subdivides a building to prevent the spread of fire and that has a fire resistance rating and structural stability. Fire doors (and fire windows) are used to protect openings in walls, floors, and ceilings against the spread of fire and smoke within, into, or out of buildings.

Cabinet. An enclosure that is designed for either surface mounting or flush mounting and is provided with a frame, mat, or trim in which a swinging door or doors are or can be hung.

Both cabinets and cutout boxes are covered in Article **312**. Cabinets are designed for surface or flush mounting with a trim to which a swinging door(s) is hung. Cutout boxes are designed for surface mounting with a swinging door(s) secured directly to the box. Panelboards are electrical assemblies designed to be placed in a cabinet or cutout box. (See the definitions of *cutout box* and *panelboard*.)

Circuit Breaker. A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without damage to itself when properly applied within its rating.

Informational Note: The automatic opening means can be integral, direct acting with the circuit breaker,

or remote from the circuit breaker.

Adjustable (as applied to circuit breakers). A qualifying term indicating that the circuit breaker can be set to trip at various values of current, time, or both, within a predetermined range.

Instantaneous Trip (as applied to circuit breakers). A qualifying term indicating that no delay is purposely introduced in the tripping action of the circuit breaker.

Inverse Time (as applied to circuit breakers). A qualifying term indicating that there is purposely introduced a delay in the tripping action of the circuit breaker, which delay decreases as the magnitude of the current increases.

Nonadjustable (as applied to circuit breakers). A qualifying term indicating that the circuit breaker does not have any adjustment to alter the value of current at which it will trip or the time required for its operation.

Setting (of circuit breakers). The value of current, time, or both, at which an adjustable circuit breaker is set to trip.

Clothes Closet. A non-habitable room or space intended primarily for storage of garments and apparel.

This definition helps to determine whether the rules of **240.24(D)**, **410.8**, and **550.11(A)** apply to an installation. If the definition does not apply, the area may be classified as something other than a clothes closet, such as a bedroom. Other requirements may then be applied, such as **210.52** and **210.70**.

Communications Equipment. The electronic equipment that performs the telecommunications operations for the transmission of audio, video, and data, and includes power equipment (e.g., dc converters, inverters, and batteries) and technical support equipment (e.g., computers).

This definition clearly indicates that power supplies and computers are considered part of the communications equipment and are thus subject to requirements that apply to that equipment. The telephone switch shown in **Exhibit 100.9**, for example, is considered part of telecommunications equipment and so is subject to the same requirements. The definition correlates with NFPA 76, *Standard for the Fire Protection of Telecommunications Facilities*.

Exhibit 100.9 A private automatic branch exchange, one part of telecommunications equipment.

Concealed. Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. *See related ROP*

Raceways and cables supported or located within hollow frames or permanently closed in by the finish of buildings are considered concealed. Open-type work — such as raceways and cables in unfinished basements, in accessible underfloor areas or attics, or behind, above, or below panels designed to allow access and that may be removed without damage to the building structure or finish — is not considered concealed. [See definition of *exposed (as applied to wiring methods)*.]

Conductor, Bare. A conductor having no covering or electrical insulation whatsoever.

Conductor, Covered. A conductor encased within material of composition or thickness that is not recognized by this *Code* as electrical insulation.

Typical covered conductors are the green-covered equipment grounding conductors contained within a nonmetallic-sheathed cable or the uninsulated grounded system conductors within the overall exterior jacket of a Type SE cable. Covered conductors should always be treated as bare conductors for working clearances because they are really uninsulated conductors. See the definition of *insulated conductor* that follows and the requirements in Article **310**.

Conductor, Insulated. A conductor encased within material of composition and thickness that is recognized by this *Code* as electrical insulation.

For the covering on a conductor to be considered insulation by this *Code*, conductors with covering material are generally required to pass minimum testing required by a product standard. One such product standard is UL 83, *Thermoplastic-Insulated Wires and Cables*. To meet the requirements of UL 83, specimens of finished single-conductor wires must pass specified tests that measure (1) resistance to flame propagation, (2) dielectric strength, even while immersed, and (3) resistance to abrasion, cracking, crushing, and impact. Only wires and cables that meet the minimum fire, electrical, and physical properties required by the applicable product standards are permitted to be marked with the letter designations found in **Table 310.104(A)**. See **310.104** for the exact requirements of insulated conductor construction and applications.

Conduit Body. A separate portion of a conduit or tubing system that provides access through a removable cover(s) to the interior of the system at a junction of two or more sections of the system or at a terminal point of the system.

Boxes such as FS and FD or larger cast or sheet metal boxes are not classified as conduit bodies.

Conduit bodies include the short-radius type as well as capped elbows and service-entrance elbows. Some conduit bodies are referred to in the trade as “condulets” and include the LB, LL, LR, C, T, and X designs. A typical conduit body is shown in **Exhibit 100.10**. See **300.15** and Article **314** for rules on the usage of conduit bodies. Type FS and Type FD boxes, which are not classified as conduit bodies, are listed with boxes in **Table 314.16(A)**.

Exhibit 100.10 Typical conduit bodies. (Courtesy of the National Electrical Contractors Association)

Connector, Pressure (Solderless). A device that establishes a connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder.

Continuous Load. A load where the maximum current is expected to continue for 3 hours or more.

Controller. A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

A controller may be a remote-controlled magnetic contactor, switch, circuit breaker, or other device that is normally used to start and stop motors and other apparatus and, in the case of motors, is required by **110.9** and **430.82** to be capable of interrupting the stalled-rotor current of the motor. Stop-and-start stations and similar control circuit components that do not open the power conductors to the motor are not considered controllers.

Cooking Unit, Counter-Mounted. A cooking appliance designed for mounting in or on a counter and consisting of one or more heating elements, internal wiring, and built-in or mountable controls.

Coordination (Selective). Localization of an overcurrent condition to restrict outages to the circuit or equipment affected, accomplished by the choice of overcurrent protective devices and their ratings or settings. *See related* **ROP ROC**

Overcurrent protective devices, such as fuses and circuit breakers, have time/current characteristics that determine the time it takes to clear the fault for a given value of fault current. Selectivity occurs when the device closest to the fault opens before the next device upstream operates. For example, any fault on a branch circuit should open the branch-circuit breaker rather than the feeder overcurrent protection. All faults on a feeder should open the feeder overcurrent protection rather than the service overcurrent protection. When selectivity occurs, the electrical system is considered to be coordinated.

With coordinated overcurrent protection, the faulted or overloaded circuit is isolated by the selective operation of only the overcurrent protective device closest to the overcurrent condition. The main goal of selective coordination is to isolate the faulted portion of the electrical circuit quickly while at the same time maintaining power to the remainder of the electrical system. The electrical system overcurrent protection must guard against short circuits and ground faults to ensure that the resulting damage is minimized while other parts of the system not directly involved with the fault are kept operational until other protective devices clear the fault.

Selective coordination requirements include emergency systems, legally required standby systems, and critical operations power systems of **700.27**, **701.27**, and **708.54**, respectively. The past *Code* requirements regarding selective coordination for elevator feeders remain in **620.62**.

Copper-Clad Aluminum Conductors. Conductors drawn from a copper-clad aluminum rod with the copper metallurgically bonded to an aluminum core. The copper forms a minimum of 10 percent of the cross-sectional area of a solid conductor or each strand of a stranded conductor.

Cutout Box. An enclosure designed for surface mounting that has swinging doors or covers secured directly to and telescoping with the walls of the box proper.

Dead Front. Without live parts exposed to a person on the operating side of the equipment.

Demand Factor. The ratio of the maximum demand of a system, or part of a system, to the total connected load of a system or the part of the system under consideration.

Device. A unit of an electrical system that carries or controls electric energy as its principal function. *See related* **ROP**

Components (such as switches, circuit breakers, fuseholders, receptacles, attachment plugs, and lampholders) that distribute or control but do not consume electrical energy are considered devices. Devices that consume incidental amounts of electrical energy in the

performance of carrying or controlling electricity are also considered devices. Some examples of these components include a switch with an internal pilot light, a GFCI receptacle, and even a magnetic contactor.

Disconnecting Means. A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

For disconnecting means for service equipment, see Part VI of Article **230**; for fuses, see Part IV of Article **240**; for circuit breakers, see Part VII of Article **240**; for appliances, see Part III of Article **422**; for space-heating equipment, see Part III of Article **424**; for motors and controllers, see Part IX of Article **430**; and for air-conditioning and refrigerating equipment, see Part II of Article **440**. (See also references for *disconnecting means* in the index.)

Dusttight. Constructed so that dust will not enter the enclosing case under specified test conditions.

Requirements for enclosures are found in **110.28**, and **Table 110.28**, Enclosure Selection, provides a basis for selecting enclosure types that are dusttight. (See also the commentary following the definition of *enclosure*.)

Duty, Continuous. Operation at a substantially constant load for an indefinitely long time.

Duty, Intermittent. Operation for alternate intervals of (1) load and no load; or (2) load and rest; or (3) load, no load, and rest.

Duty, Periodic. Intermittent operation in which the load conditions are regularly recurrent.

Duty, Short-Time. Operation at a substantially constant load for a short and definite, specified time.

Duty, Varying. Operation at loads, and for intervals of time, both of which may be subject to wide variation.

Information on the protection of intermittent, periodic, short-time, and varying-duty motors against overload can be found in **430.33**.

Dwelling, One-Family. A building that consists solely of one dwelling unit.

Dwelling, Two-Family. A building that consists solely of two dwelling units.

Dwelling, Multifamily. A building that contains three or more dwelling units.

Dwelling Unit. A single unit, providing complete and independent living facilities for one or more persons, including permanent provisions for living, sleeping, cooking, and sanitation.

Where dwelling units are referenced throughout the *Code*, it is important to note that rooms in motels, hotels, and similar occupancies could be classified as dwelling units if they satisfy the requirements of the definition. **Exhibit 100.11** illustrates a motel or hotel room that clearly meets the definition because it has permanent provisions for living, sleeping, cooking, and sanitation. See also the definition of *mobile home* in **550.2**.

Exhibit 100.11 Example of motel or hotel room considered to be a dwelling unit.

Electric Sign. A fixed, stationary, or portable self-contained, electrically illuminated utilization equipment with words or symbols designed to convey information or attract attention.

Electric Power Production and Distribution Network. Power production, distribution, and utilization equipment and facilities, such as electric utility systems that deliver electric power to the connected loads, that are external to and not controlled by an interactive system.

Enclosed. Surrounded by a case, housing, fence, or wall(s) that prevents persons from accidentally contacting energized parts.

Enclosure. The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts or to protect the equipment from physical damage.

Informational Note: See **Table 110.28** for examples of enclosure types.

Enclosures are required by **110.28** to be marked with a number that identifies the locations where the type can be used. Enclosures that comply with the requirements for more than one type of enclosure are marked with multiple designations. See the commentary following **110.28** for details on enclosure markings and types and also see **Table 110.28**, which lists the types of enclosures required to be used in specific locations.

Energized. Electrically connected to, or is, a source of voltage.

The term *energized* is not limited to equipment that is “connected to a source of voltage.” Equipment such as batteries, capacitors, and conductors with induced voltages must also be considered energized. Also see the definitions of *exposed (as applied to live parts)* and *live parts*.

Equipment. A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, an electrical installation.

This definition was revised to clarify that machinery is also considered equipment. For further information on machinery, see Article **670** and NFPA 79, *Electrical Standard for Industrial Machinery*.

Explosionproof Equipment. Equipment enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor that may occur within it and of preventing the ignition of

a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and that operates at such an external temperature that a surrounding flammable atmosphere will not be ignited thereby.

Changed From 2008

- 100 Explosionproof Equipment: Revised by replacing the term “apparatus” with “equipment” in the title and text.

Informational Note: For further information, see ANSI/UL 1203-2006, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*.

Exposed (as applied to live parts). Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts that are not suitably guarded, isolated, or insulated. *See related ROP*

This definition applies to energized live parts that must be guarded to avoid accidental contact and injury. See **110.27** for the requirements for guarding live parts. Also see the definitions of *energized* and *live parts*.

Exposed (as applied to wiring methods). On or attached to the surface or behind panels designed to allow access.

See **Exhibit 100.2**, which illustrates wiring methods that would be considered “exposed” because they are located above a suspended ceiling with lift-out panels.

Externally Operable. Capable of being operated without exposing the operator to contact with live parts.

Feeder. All circuit conductors between the service equipment, the source of a separately derived system, or other power supply source and the final branch-circuit overcurrent device.

See the commentary following the definition of *branch circuit*, including **Exhibit 100.7**, which illustrates the difference between branch circuits and feeders.

Festoon Lighting. A string of outdoor lights that is suspended between two points.

The general requirements for festoon lighting are located in **225.6(B)**.

Fitting. An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

Items such as condulets, conduit couplings, EMT connectors and couplings, and threadless connectors are considered fittings.

Garage. A building or portion of a building in which one or more self-propelled vehicles can be kept for use, sale, storage, rental, repair, exhibition, or demonstration purposes.

Informational Note: For commercial garages, repair and storage, see Article **511**.

The definition of *garage* includes the garages for electric vehicles, covered in Article **625**.

Ground. The earth.

Ground Fault. An unintentional, electrically conducting connection between an ungrounded conductor of an electrical circuit and the normally non-current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment, or earth. *See related ROP*

Changed From 2008

- 100 Ground Fault: Relocated to Article 100

Grounded (Grounding). Connected (connecting) to ground or to a conductive body that extends the ground connection.

Grounded, Solidly. Connected to ground without inserting any resistor or impedance device.

Grounded Conductor. A system or circuit conductor that is intentionally grounded.

Ground-Fault Circuit Interrupter (GFCI). A device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds the values established for a Class A device.

Informational Note: Class A ground-fault circuit interrupters trip when the current to ground is 6 mA or higher and do not trip when the current to ground is less than 4 mA. For further information, see UL 943, *Standard for Ground-Fault Circuit Interrupters*.

The commentary following **210.8** contains a list of applicable cross-references for ground-fault circuit interrupters (GFCIs). **Exhibits 210.6** through **210.16** contain specific information regarding the requirements for GFCIs.

Ground-Fault Protection of Equipment. A system intended to provide protection of equipment from damaging line-to-ground fault currents by operating to cause a disconnecting means to open all ungrounded conductors of the faulted circuit. This protection is provided at current levels less than those required to protect conductors from damage through the operation of a supply circuit overcurrent device.

See the commentary following **230.95**, **426.28**, and **427.22**.

Grounding Conductor, Equipment (EGC). The conductive path(s) installed to connect normally non-current-carrying metal parts of equipment together and to the system grounded conductor or to the grounding electrode conductor, or both. *See related ROP*

Informational Note No. 1: It is recognized that the equipment grounding conductor also performs bonding.

Informational Note No. 2: See **250.118** for a list of acceptable equipment grounding conductors.

Requirements for proper sizing of equipment grounding conductors are found in **250.122** and **Table 250.122**.

Grounding Electrode. A conducting object through which a direct connection to earth is established.

For requirements pertaining to grounding electrodes, see **250.52(A)**.

Grounding Electrode Conductor. A conductor used to connect the system grounded conductor or the equipment to a grounding electrode or to a point on the grounding electrode system.

The grounding electrode conductor, which is used at the service or a separately derived system, is covered extensively in Article **250**, Part III. These conductors are required to be copper, aluminum, or copper-clad aluminum in **250.62** and to be sized according to **250.66** and **Table 250.66**. **Exhibit 100.6** and **Exhibit 250.1** show a grounding electrode conductor in a typical grounding system for a single-phase, 3-wire service.

Guarded. Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach or contact by persons or objects to a point of danger.

Guest Room. An accommodation combining living, sleeping, sanitary, and storage facilities

within a compartment.

Guest Suite. An accommodation with two or more contiguous rooms comprising a compartment, with or without doors between such rooms, that provides living, sleeping, sanitary, and storage facilities.

Some requirements for guest rooms in hotels, motels, and similar occupancies are found in **210.60**.

Handhole Enclosure. An enclosure for use in underground systems, provided with an open or closed bottom, and sized to allow personnel to reach into, but not enter, for the purpose of installing, operating, or maintaining equipment or wiring or both.

Requirements for handhole enclosures are found in **314.30**. **Exhibit 100.12** shows the installation of one type of handhole enclosure. Handhole enclosures are required by **314.30** to be “identified” for use in underground systems.

Exhibit 100.12 Example of handhole enclosure installation. (Courtesy of Quazite ®/Hubbell Lenoir City, Inc.)

Hoistway. Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

See Article **620** for the installation of electrical equipment and wiring methods in hoistways.

Identified (as applied to equipment). Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular *Code* requirement.

Informational Note: Some examples of ways to determine suitability of equipment for a specific purpose, environment, or application include investigations by a qualified testing laboratory (listing and labeling), an inspection agency, or other organizations concerned with product evaluation.

In Sight From (Within Sight From, Within Sight). Where this *Code* specifies that one equipment shall be “in sight from,” “within sight from,” or “within sight of,” and so forth, another equipment, the specified equipment is to be visible and not more than 15 m (50 ft) distant from the other.

There are several requirements in the *Code* for a disconnecting means to be in sight from the equipment that it controls. For example, **430.102** requires the disconnecting means to be in sight from the controller. Three exceptions permit the disconnect to be located elsewhere.

Exhibit 430.18 depicts requirements for the placement of a disconnecting means that is not in sight of a motor.

Interactive System. An electric power production system that is operating in parallel with and capable of delivering energy to an electric primary source supply system.

Interrupting Rating. The highest current at rated voltage that a device is identified to interrupt under standard test conditions.

Changed From 2008

- 100 Interrupting Rating: Revised by replacing “intended” with “identified.”

Informational Note: Equipment intended to interrupt current at other than fault levels may have its interrupting rating implied in other ratings, such as horsepower or locked rotor current.

Interrupting ratings are essential in the coordination of electrical systems so that available fault currents can be properly controlled. Sections specifically dealing with interrupting ratings are **110.9**, **240.60(C)**, **240.83(C)**, and **240.86**. **Exhibit 100.13** depicts the label of a 1600 amp frame circuit breaker showing the interrupting capacity ratings.

Exhibit 100.13 Interrupting ratings information on the label of a 1600 ampere circuit breaker.

Intersystem Bonding Termination. A device that provides a means for connecting bonding conductors for communications systems to the grounding electrode system. *See related* **ROP ROC**

Changed From 2008

- 100 Intersystem Bonding Termination: Revised to clarify that it is used to connect bonding conductors of the communications system to the grounding electrode system.

An intersystem bonding termination provides a convenient means to comply with the requirements for intersystem bonding and grounding of communication systems. It is a dedicated and well-defined location for terminating the grounding conductors required in

Chapter **8** and **770.93**. The termination would have sufficient capacity to handle multiple communication systems (telecom, satellite, CATV) on premises. The intersystem bonding termination device is intended to provide a means of connecting these grounding conductors to the service, building, or structure grounding electrode system. This is an important safety measure to prevent occurrences of voltages between the communication system and the power system. Frequently, in new construction, the grounding electrode, the raceway, and the grounding electrode conductor are hidden behind walls and are not accessible for bonding connection. See **Exhibit 250.41** for an example of a device used to provide intersystem bonding.

Isolated (as applied to location). Not readily accessible to persons unless special means for access are used.

See also the definition of *accessible, readily*.

Kitchen. An area with a sink and permanent provisions for food preparation and cooking.

Changed From 2008

- 100 Kitchen: The definition was revised by replacing “facilities” with “provisions.”

Because the term *kitchen* is used frequently in the *Code*, a common definition for this word is necessary so that uniform and consistent application of *Code* requirements can be established.

Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Equipment and conductors required or permitted by this *Code* are acceptable only if they have been approved for a specific environment or application by the authority having jurisdiction, as stated in **110.2**. See **90.7** regarding the examination of equipment for safety. Listing or labeling by a qualified testing laboratory provides a basis for approval.

Lighting Outlet. An outlet intended for the direct connection of a lampholder or luminaire.

Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

Informational Note: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. Use of the system employed by the listing organization allows the authority having jurisdiction to identify a listed product.

The *NEC* definition of *listed* matches the definition of *listed* found in the NFPA Regulations Governing Committee Projects. See definitions of *approved, authority having jurisdiction (AHJ), identified (as applied to equipment), and labeled*.

Live Parts. Energized conductive components.

The definition of *live parts* is associated with all voltage levels, not just voltage levels that present a shock hazard.

Location, Damp. Locations protected from weather and not subject to saturation with water or other liquids but subject to moderate degrees of moisture. Examples of such locations include partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements, some barns, and some cold-storage warehouses. *See related* **ROP ROC**

Location, Dry. A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

Location, Wet. Installations underground or in concrete slabs or masonry in direct contact with the earth; in locations subject to saturation with water or other liquids, such as vehicle washing areas; and in unprotected locations exposed to weather.

The inside of a raceway in a wet location and a raceway installed underground are considered wet locations. Therefore, any conductors contained therein would be required to be suitable for wet locations.

A general requirement pertaining to wet locations is found in **300.6(D)**, which also identifies numerous examples of wet locations. The requirements for luminaires installed in wet locations are found in **410.10(A)**. *See also patient care area* in **517.2** for a definition of wet procedure locations in a patient care area. Suitable enclosures for wet locations can be found in **Table 110.28**.

Luminaire. A complete lighting unit consisting of a light source such as a lamp or lamps, together with the parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source or the ballast or to distribute the light. A lampholder itself is not a luminaire.

Although new lighting techniques such as light pipes and glass fiber optics are sometimes referred to as “lighting systems,” the definition of *luminaire* does not necessarily preclude such systems, because light pipes and fiber optics are actually “parts designed to distribute the light.”

Luminaire is the term specified by IESNA, the ANSI/UL safety standards, and the ANSI/NEMA performance standards for lighting products previously referred to as “light fixtures” in the United States. *Luminaire* is also the term used in IEC standards and accepted globally.

Metal-Enclosed Power Switchgear. A switchgear assembly completely enclosed on all sides and top with sheet metal (except for ventilating openings and inspection windows) and containing primary power circuit switching, interrupting devices, or both, with buses and connections. The assembly may include control and auxiliary devices. Access to the interior of the enclosure is provided by doors, removable covers, or both. Metal-enclosed power switchgear is available in non-arc-resistant or arc-resistant constructions. *See related* **ROP ROC**

Motor Control Center. An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

Multioutlet Assembly. A type of surface, flush, or freestanding raceway designed to hold conductors and receptacles, assembled in the field or at the factory.

The definition of *multioutlet assembly* includes a reference to a freestanding assembly with multiple outlets, commonly called a power pole. In dry locations, metallic and nonmetallic multioutlet assemblies are permitted; however, they are not permitted to be installed if concealed. See Article **380** for details on recessing multioutlet assemblies. **Exhibit 100.14** shows a multioutlet assembly used for countertop appliances.

Exhibit 100.14 Multioutlet assembly installed to serve countertop appliances. (Courtesy of Legrand/Wiremold®)

Neutral Conductor. The conductor connected to the neutral point of a system that is intended to carry current under normal conditions.

This definition is similar to the IEC definition of *neutral conductor*. The proposed definition was adapted to *NEC* language and was expanded to cover the various cases relevant to the *NEC*.

It is important to remember that the neutral conductor is a current-carrying conductor. Many believe that, because the neutral conductor is a grounded conductor, it is safe to work on it while it is energized. This is a very dangerous practice that has led to many serious electric shocks.

Neutral Point. The common point on a wye-connection in a polyphase system or midpoint on a single-phase, 3-wire system, or midpoint of a single-phase portion of a 3-phase delta system, or a midpoint of a 3-wire, direct-current system.

Informational Note: At the neutral point of the system, the vectorial sum of the nominal voltages from all other phases within the system that utilize the neutral, with respect to the neutral point, is zero potential.

Exhibit 100.15 illustrates four examples of a neutral point in a system.

Exhibit 100.15 Four examples of a neutral point.

Nonautomatic. Requiring human intervention to perform a function.

Changed From 2008

- 100 Nonautomatic: The definition has been revised to correlate with the definition of the term “automatic.”

A nonautomatic function is essentially a manual function.

Nonlinear Load. A load where the wave shape of the steady-state current does not follow the wave shape of the applied voltage.

Informational Note: Electronic equipment, electronic/electric-discharge lighting, adjustable-speed drive systems, and similar equipment may be nonlinear loads.

Nonlinear loads are a major cause of harmonic currents in modern circuits. Additional conductor heating is just one of the undesirable operational effects often associated with harmonic currents. Informational Note No. 1 following **310.15(A)(3)** points out that harmonic current, as well as fundamental current, should be used in determining the heat generated internally in a conductor.

Actual circuit measurements of current for nonlinear loads should be made using only true rms-measuring ammeter instruments. Averaging ammeters produces inaccurate values if used to measure nonlinear loads. See the associated commentary following **310.15(B)(5)(c)**.

Outlet. A point on the wiring system at which current is taken to supply utilization equipment.

This term is frequently misused to refer to receptacles. Although receptacle outlets are outlets, not all outlets are receptacle outlets. Common examples of outlets include lighting outlets and smoke alarm outlets.

Outline Lighting. An arrangement of incandescent lamps, electric-discharge lighting, or other electrically powered light sources to outline or call attention to certain features such as the shape of a building or the decoration of a window.

The definition of *outline lighting* includes low-voltage, light-emitting diodes as well as other luminaires installed to form various shapes. See Article **600** for requirements for outline lighting.

Overcurrent. Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload, short circuit, or ground fault.

Informational Note: A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Therefore, the rules for overcurrent protection are specific for particular situations.

Overcurrent Protective Device, Branch-Circuit. A device capable of providing protection for service, feeder, and branch circuits and equipment over the full range of overcurrents between its rated current and its interrupting rating. Branch-circuit overcurrent protective devices are provided with interrupting ratings appropriate for the intended use but no less than 5000 amperes. *See related* **ROP ROC**

Changed From 2008

- 100 Overcurrent Protective Device, Branch Circuit: Editorially revised for usability. As a result of the revision, the definitions related to overcurrent protection will be located in the same part of Article 100.

The protection provided may be overload, short-circuit, or ground-fault or a combination, depending on the application. See also definition for *overcurrent protective device, supplementary*.

Overcurrent Protective Device, Supplementary. A device intended to provide limited overcurrent protection for specific applications and utilization equipment such as luminaires and appliances. This limited protection is in addition to the protection provided in the required branch circuit by the branch-circuit overcurrent protective device.

Changed From 2008

- 100 Overcurrent Protective Device, Supplementary : Editorially revised for usability. As a result of the revision, the definitions relative to overcurrent protection will be located in the same part of Article 100.

There are two levels of overcurrent protection within branch circuits: branch-circuit overcurrent protection and supplementary overcurrent protection. The devices used to provide overcurrent protection are different, and the differences are found in the product standards UL 489, *Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures*, and UL 1077, *Supplementary Protectors for Use in Electrical Equipment*.

The *NEC* requires that all branch circuits use only branch-circuit “rated” overcurrent protective devices to protect branch circuits, but it permits supplementary overcurrent protection devices for limited use downstream of the branch-circuit “rated” overcurrent protective device.

The definition of *supplementary overcurrent protection device* makes two important distinctions between overcurrent protective devices. First, the use of a supplementary device is specifically limited to a few applications. Second, where it is used, the supplementary device must be in addition to and be protected by the more robust branch-circuit overcurrent protective device.

Overload. Operation of equipment in excess of normal, full-load rating, or of a conductor in excess of rated ampacity that, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload.

Panelboard. A single panel or group of panel units designed for assembly in the form of a single panel, including buses and automatic overcurrent devices, and equipped with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall, partition, or other support; and accessible only from the front.

See Article **408**, Parts I, III, and IV, for detailed requirements concerning panelboards.

Plenum. A compartment or chamber to which one or more air ducts are connected and that forms part of the air distribution system.

The *NEC* definition of *plenum* is essentially the same as that in NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*. *NEC* requirements on wiring methods permitted within plenums are found in **300.22(B)**. The *NEC* definition is not intended to apply to the space above a suspended ceiling that is used for environmental air as referred to in **300.22(C)**, while the air-handling space under a computer room floor has special requirements, as given in Article **645**.

Power Outlet. An enclosed assembly that may include receptacles, circuit breakers, fuseholders, fused switches, buses, and watt-hour meter mounting means; intended to supply and control power to mobile homes, recreational vehicles, park trailers, or boats or to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

Premises Wiring (System). Interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all their associated hardware, fittings, and wiring devices, both permanently and temporarily installed. This includes (a) wiring from the service point or power source to the outlets or (b) wiring from and including the power source to the outlets where there is no service point. *See related* **ROP ROC**

Such wiring does not include wiring internal to appliances, luminaires, motors, controllers, motor control centers, and similar equipment.

Qualified Person. One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.

Informational Note: Refer to NFPA 70E-2009, *Standard for Electrical Safety in the Workplace*, for electrical safety training requirements.

This definition points out that safety training that qualifies a worker is training in hazard recognition and avoidance. The following excerpt on training requirements is taken from **110.6** in the 2009 edition of *NFPA 70E®*, *Standard for Electrical Safety in the Workplace®*. These training requirements are presented here only as an aid to understanding the requisite minimum training requirements specified in *NFPA 70E*, a recognized and widely used workplace safety standard. It is important to understand that this commentary, like the informational note following the definition of *qualified person*, is not mandatory. Mandatory application of these safety training provisions is dependent on whether *NFPA 70E* has been specifically adopted by the enforcing jurisdiction.

Excerpt from NFPA 70E®-2009, Standard for Electrical Safety in the Workplace®

110.6 Training Requirements.

(A) Safety Training. The training requirements contained in this section shall apply to employees who face a risk of electrical hazard that is not reduced to a safe

level by the applicable electrical installation requirements. Such employees shall be trained to understand the specific hazards associated with electrical energy. They shall be trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with their respective job or task assignments. Employees shall be trained to identify and understand the relationship between electrical hazards and possible injury.

(B) Type of Training. The training required by this section shall be classroom or on-the-job type, or a combination of the two. The degree of training provided shall be determined by the risk to the employee.

(C) Emergency Procedures. Employees exposed to shock hazards shall be trained in methods of release of victims from contact with exposed energized electrical conductors or circuit parts. Employees shall be regularly instructed in methods of first aid and emergency procedures, such as approved methods of resuscitation, if their duties warrant such training. Training of employees in approved methods of resuscitation, including cardiopulmonary resuscitation, shall be certified by the employer annually.

(D) Employee Training.

(1) Qualified Person. A qualified person shall be trained and knowledgeable of the construction and operation of equipment or a specific work method and be trained to recognize and avoid the electrical hazards that might be present with respect to that equipment or work method.

(a) Such persons shall also be familiar with the proper use of the special precautionary techniques, personal protective equipment, including arc-flash, insulating and shielding materials, and insulated tools and test equipment. A person can be considered qualified with respect to certain equipment and methods but still be unqualified for others.

(b) Such persons permitted to work within the Limited Approach Boundary of exposed energized electrical conductors and circuit parts operating at 50 volts or more shall, at a minimum, be additionally trained in all of the following:

- (1) The skills and techniques necessary to distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment
- (2) The skills and techniques necessary to determine the nominal voltage of exposed energized electrical conductors and circuit parts
- (3) The approach distances specified in Table 130.2(C) [of *NFPA 70E*] and the corresponding voltages to which the qualified person will be exposed
- (4) The decision-making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely

(c) An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person shall be considered to be a qualified person for the performance of those duties.

(d) Tasks that are performed less often than once per year shall require retraining before the performance of the work practices involved.

(e) Employees shall be trained to select an appropriate voltage detector and

shall demonstrate how to use a device to verify the absence of voltage, including interpreting indications provided by the device. The training shall include information that enables the employee to understand all limitations of each specific voltage detector that may be used.

(2) Unqualified Persons. Unqualified persons shall be trained in and be familiar with any of the electrical safety-related practices that might not be addressed specifically by Chapter 1 [of *NFPA 70E*] but are necessary for their safety.

Raceway. An enclosed channel of metal or nonmetallic materials designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this *Code*. Raceways include, but are not limited to, rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible conduit, flexible metallic tubing, flexible metal conduit, electrical nonmetallic tubing, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways. *See related* **ROP ROC**

General requirements and wiring methods for raceways are found within Article **300** and throughout Chapter **3** for more specific applications. Cable trays (see Article **392**) are support systems for wiring methods and are not considered to be raceways.

Rainproof. Constructed, protected, or treated so as to prevent rain from interfering with the successful operation of the apparatus under specified test conditions.

See the commentary following **110.28**.

Raintight. Constructed or protected so that exposure to a beating rain will not result in the entrance of water under specified test conditions.

Requirements for enclosures are in **110.28**, and the informational note to **Table 110.28** provides information on enclosure types that are considered to be raintight. Also see the commentary accompanying **110.28** for details on enclosure markings. Related requirements for raintight boxes and cabinets are found in **300.6(A)(2)**.

Receptacle. A receptacle is a contact device installed at the outlet for the connection of an attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is two or more contact devices on the same yoke.

Exhibit 100.16 shows one single and two multiple receptacles.

Exhibit 100.16 Receptacles.

Receptacle Outlet. An outlet where one or more receptacles are installed.

See **Exhibit 100.16** and the commentary following **220.14(I)**.

Remote-Control Circuit. Any electrical circuit that controls any other circuit through a relay or an equivalent device.

Exhibit 100.17 illustrates a remote-control circuit that starts and stops an electric motor.

Exhibit 100.17 Remote-control circuit for starting and stopping an electric motor.

Sealable Equipment. Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure. *See related* **ROP**

Separately Derived System. A premises wiring system whose power is derived from a source of electric energy or equipment other than a service. Such systems have no direct connection from circuit conductors of one system to circuit conductors of another system, other than connections through the earth, metal enclosures, metallic raceways, or equipment grounding conductors. *See related* **ROP ROC**

Changed From 2008

- 100 Separately Derived System: Revised to clarify that a separately derived system may have some incidental connections to other systems, such as through metal raceways, equipment grounding conductors, or the earth.

Examples of separately derived systems include generators, batteries, converter windings, transformers, and solar photovoltaic systems, provided they “have no direct electrical connection” to another source. This definition was revised for the 2011 *Code* to clarify the interconnection between separately derived systems and service derived electrical systems.

The earth, metal enclosures, metal raceways, and equipment grounding conductors may provide incidental connection between systems. However, the grounded circuit conductors are not intended to be directly connected.

Service. The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

A service can only be supplied by the serving utility. If electric energy is supplied by other than the serving utility, the supplied conductors and equipment are considered feeders, not a service.

Service Cable. Service conductors made up in the form of a cable.

Service Conductors. The conductors from the service point to the service disconnecting means.

Service conductors is a broad term and may include service drops, service laterals, and service-entrance conductors. This term specifically excludes, however, any wiring on the supply side (serving utility side) of the service point. Simply put, the service conductors originate at the service point (where the serving utility ends) and end at the service disconnect. These service conductors may originate only from the serving utility.

If the utility has specified that the service point is at the utility pole, the service conductors from an overhead distribution system originate at the utility pole and terminate at the service disconnecting means.

If the utility has specified that the service point is at the utility manhole, the service conductors from an underground distribution system originate at the utility manhole and terminate at the service disconnecting means. Where utility-owned primary conductors are extended to outdoor pad-mounted transformers on private property, the service conductors originate at the secondary connections of the transformers only if the utility has specified that the service point is at the secondary connections.

See Article 230, Part VIII, and the commentary following 230.200 for service conductors exceeding 600 volts, nominal.

Service Conductors, Overhead. The overhead conductors between the service point and the first point of connection to the service-entrance conductors at the building or other structure.

Changed From 2008

- 100 Service Conductors, Overhead: Added new term for what was formerly known as service-drop conductors. This term distinguishes overhead service conductors that are part of the premises wiring system from the overhead conductors that are on the line side of the service point.

Service Conductors, Underground. The underground conductors between the service point and the first point of connection to the service-entrance conductors in a terminal box, meter, or other enclosure, inside or outside the building wall.

Changed From 2008

- 100 Service Conductors, Underground: Added new term for what was formerly known as service-lateral conductors. Revised so that the definition more clearly describes the beginning and ending points of underground service conductors. The term distinguishes underground service conductors that are part of the premises wiring system from the underground service

conductors that are on the line side of the service point. An informational note has been added following the revised definition to specify the point of connection where there is no terminal box, meter, or other enclosure.

Informational Note: Where there is no terminal box, meter, or other enclosure, the point of connection is considered to be the point of entrance of the service conductors into the building.

Service Drop. The overhead conductors between the utility electric supply system and the service point.

Changed From 2008

- 100 Service Drop: Revised term now applies only to overhead conductors that are on the line side of the service point.

The definition of *service drop* was revised for the 2011 *Code*. This revision correlates with the changes to the definitions of the term *service lateral conductors*. Service drop and service lateral conductors are conductors on the line side of the service point and are not subject to the *NEC*. Overhead conductors on the load side of the service point are overhead service conductors.

In **Exhibit 100.18**, the service-drop conductors run from the utility pole and connect to the service-entrance conductors at the service point. Conductors on the utility side of the service point are not covered by the *NEC*. The utility specifies the location of the service point. Exact locations of the service point may vary from utility to utility, as well as from occupancy to occupancy.

Exhibit 100.18 Conductors in an overhead service.

Service-Entrance Conductors, Overhead System. The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop or overhead service conductors.

Changed From 2008

- 100 Service-Entrance Conductors, Overhead System: Revised to correlate with the changes made to the definitions of “service drop” and “service lateral conductors.”

See **Exhibit 100.18** for an illustration of service-entrance conductors in an overhead system. The system shows a service drop from a utility pole to attachment on a house and service-entrance conductors from point of attachment (spliced to service-drop conductors), down the side of the house, through the meter socket, and terminating in the service equipment. In this instance, the service point is at the drip loop.

Service-Entrance Conductors, Underground System. The service conductors between the terminals of the service equipment and the point of connection to the service lateral or underground service conductors.

Changed From 2008

- 100 Service-Entrance Conductors, Underground System: Revised to correlate with the changes made to the definitions of “service drop” and “service lateral.”

Informational Note: Where service equipment is located outside the building walls, there may be no service-entrance conductors or they may be entirely outside the building.

See **Exhibit 100.19** for an illustration of service-entrance conductors in an underground system. The illustration on the top shows underground service laterals conductors run from a pole to a service point underground. The conductors from the service point into the building are underground service conductors. The illustration on the bottom shows service lateral conductors run from a utility transformer.

Exhibit 100.19 Underground systems showing service laterals run from a pole (top) and from a transformer (bottom).

Service Equipment. The necessary equipment, usually consisting of a circuit breaker(s) or switch(es) and fuse(s) and their accessories, connected to the load end of service conductors to a building or other structure, or an otherwise designated area, and intended to constitute the main control and cutoff of the supply.

Service equipment may consist of circuit breakers or fused switches that are provided to disconnect all ungrounded conductors in a building or other structure from the service-entrance conductors. It is important to understand that individual meter socket enclosures are not considered service equipment according to **230.66**. A case could be made that potential and current transformer cabinets associated with utility meter enclosures are also excluded from the definition of *service equipment*.

The disconnecting means at any one location in a building or other structure is not allowed to consist of more than six circuit breakers or six switches and is required to be readily accessible either outside or inside nearest the point of entrance of the service-entrance conductors. Requirements for service conductors outside the building are in **230.6** and those

for disconnecting means are throughout Article 230, Part VI.

Service Lateral. The underground conductors between the utility electric supply system and the service point.

Changed From 2008

- 100 Service Lateral: Revised to clarify that these conductors are under the exclusive control of the utility company. Term now applies only to underground conductors that are on the line side of the service point.

The definition of *service lateral* was revised for the 2011 *Code*. This revision correlates with the changes to the definitions of the term *service drop conductors*. Service drop and service lateral conductors are conductors on the line side of the service point and are not subject to the *NEC*. Underground conductors on the load side of the service point are underground service conductors.

As **Exhibit 100.19** shows, the underground service laterals may be run from poles or from transformers and with or without terminal boxes, provided they terminate at the service point. The next transition would be to the underground service conductors, which would connect to the service entrance conductors, or they may terminate in a terminal box, meter, or some other enclosure, which may be inside or outside of the building. Conductors on the utility side of the service point are not covered by the *NEC*. The utility specifies the location of the service point. Exact locations of the service point may vary from utility to utility, as well as from occupancy to occupancy.

Service Point. The point of connection between the facilities of the serving utility and the premises wiring.

Changed From 2008

- 100 Service Point: Added "Informational Note" to provide additional information on the line of demarcation between the conductors of the serving utility and the premises wiring.

Informational Note: The service point can be described as the point of demarcation between where the serving utility ends and the premises wiring begins. The serving utility generally specifies the location of the service point based on the conditions of service.

Because the location of the service point is generally determined by the utility, the overhead conductors or the underground conductors may or may not be part of the service covered by the *NEC*. For these types of conductors to be covered, they must be physically located on the premises wiring side of the service point.

Based on the definition of the term *service point* any conductor on the serving utility side of the service point generally is not covered by the *NEC*. For example, a typical suburban residence has overhead conductors from the utility pole to the house. If the utility specifies that the service point is at the point of attachment of the overhead conductors to the house, the overhead conductors are service drop conductors that are not covered by the *Code* because the conductors are not on the premises wiring side of the service point. Alternatively, if the utility specifies that the service point is "at the pole," the overhead conductors are considered overhead service conductors, and the *NEC* would apply to these conductors.

Exact locations for a service point may vary from utility to utility, as well as from occupancy to occupancy.

Short-Circuit Current Rating. The prospective symmetrical fault current at a nominal voltage to which an apparatus or system is able to be connected without sustaining damage exceeding defined acceptance criteria.

The short-circuit current rating is marked on the equipment nameplate, as shown in **Exhibit 100.20**. This value must not be exceeded. Otherwise, the equipment can be damaged by short-circuit currents, posing a hazard to personnel and property.

Exhibit 100.20 Short-circuit current rating on equipment nameplate.

Show Window. Any window used or designed to be used for the display of goods or advertising material, whether it is fully or partly enclosed or entirely open at the rear and whether or not it has a platform raised higher than the street floor level.

See **220.14(G)**, **220.43(A)**, and **Exhibit 220.1** for show-window lighting load requirements.

Signaling Circuit. Any electrical circuit that energizes signaling equipment.

Solar Photovoltaic System. The total components and subsystems that, in combination, convert solar energy into electric energy suitable for connection to a utilization load. *See related* **ROP ROC**

See Article **690** for solar photovoltaic system requirements.

Special Permission. The written consent of the authority having jurisdiction.

The authority having jurisdiction for enforcement of the *Code* is responsible for making interpretations and granting special permission contemplated in a number of the rules, as stated in **90.4**. For requirements governing special permission situations, see **110.26(A)(1)(b)**, **230.2(B)**, and **426.14**.

Structure. That which is built or constructed.

Surge Arrester. A protective device for limiting surge voltages by discharging or bypassing surge current; it also prevents continued flow of follow current while remaining capable of repeating these functions.

For further information on surge arresters, see Article **280**.

Surge-Protective Device (SPD). A protective device for limiting transient voltages by diverting or limiting surge current; it also prevents continued flow of follow current while remaining capable of repeating these functions and is designated as follows:

Type 1: Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service disconnect overcurrent device.

Type 2: Permanently connected SPDs intended for installation on the load side of the service disconnect overcurrent device, including SPDs located at the branch panel.

Type 3: Point of utilization SPDs.

Type 4: Component SPDs, including discrete components, as well as assemblies.

Informational Note: For further information on Type 1, Type 2, Type 3, and Type 4 SPDs, see UL 1449, *Standard for Surge Protective Devices*.

Type 1 and Type 2 surge-protective devices (SPDs) for permanently connected devices for use on circuits not exceeding 600 volts are included in UL 1449, *Transient Voltage Surge Suppressors*. Requirements related to SPDs are found in Article **280**.

Switch, Bypass Isolation. A manually operated device used in conjunction with a transfer switch to provide a means of directly connecting load conductors to a power source and of disconnecting the transfer switch.

See **700.5(B)** and **701.5(B)** for requirements pertaining to bypass isolation transfer switches.

Switch, General-Use. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

Switch, General-Use Snap. A form of general-use switch constructed so that it can be installed in device boxes or on box covers, or otherwise used in conjunction with wiring systems recognized by this *Code*.

Switch, Isolating. A switch intended for isolating an electrical circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

Switch, Motor-Circuit. A switch rated in horsepower that is capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

Switch, Transfer. An automatic or nonautomatic device for transferring one or more load conductor connections from one power source to another.

Switchboard. A large single panel, frame, or assembly of panels on which are mounted on the face, back, or both, switches, overcurrent and other protective devices, buses, and usually instruments. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. *See related* **ROP ROC**

Busbars are required to be arranged to avoid inductive overheating. Service busbars are required to be isolated by barriers from the remainder of the switchboard. Although not required, most modern switchboards are totally enclosed to minimize the probability of spreading fire to adjacent combustible materials and to guard live parts. Requirements for

switchboards are located in Article **408**.

Thermal Protector (as applied to motors). A protective device for assembly as an integral part of a motor or motor-compressor that, when properly applied, protects the motor against dangerous overheating due to overload and failure to start.

Informational Note: The thermal protector may consist of one or more sensing elements integral with the motor or motor-compressor and an external control device.

Thermally Protected (as applied to motors). The words *Thermally Protected* appearing on the nameplate of a motor or motor-compressor indicate that the motor is provided with a thermal protector.

Ungrounded. Not connected to ground or to a conductive body that extends the ground connection.

Uninterruptible Power Supply. A power supply used to provide alternating current power to a load for some period of time in the event of a power failure.

Changed From 2008

- 100 Uninterruptible Power Supply: Added to describe the function of an uninterruptible power supply.

Informational Note: In addition, it may provide a more constant voltage and frequency supply to the load, reducing the effects of voltage and frequency variations.

Utility-Interactive Inverter. An inverter intended for use in parallel with an electric utility to supply common loads that may deliver power to the utility.

Utilization Equipment. Equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes.

Ventilated. Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

See the commentary following **110.13(B)**.

Volatile Flammable Liquid. A flammable liquid having a flash point below 38°C (100°F), or a flammable liquid whose temperature is above its flash point, or a Class II combustible liquid that has a vapor pressure not exceeding 276 kPa (40 psia) at 38°C (100°F) and whose temperature is above its flash point.

The flash point of a liquid is defined as the minimum temperature at which it gives off sufficient vapor to form an ignitable mixture, with the air near the surface of the liquid or within the vessel used to contain the liquid. An ignitable mixture is defined as a mixture within the explosive or flammable range (between upper and lower limits) that is capable of the propagation of flame away from the source of ignition when ignited. Some emission of vapors takes place below the flash point but not in sufficient quantities to form an ignitable mixture.

Voltage (of a circuit). The greatest root-mean-square (rms) (effective) difference of potential between any two conductors of the circuit concerned.

Informational Note: Some systems, such as 3-phase 4-wire, single-phase 3-wire, and 3-wire direct current, may have various circuits of various voltages.

Common 3-phase, 4-wire wye systems are 480/277 volts and 208/120 volts. The voltage of the circuit is the higher voltage between any two phase conductors (i.e., 480 volts or 208 volts). The voltage of the circuit of a 2-wire feeder or branch circuit (single phase and the grounded conductor) derived from these systems would be the lower voltage between two

conductors (i.e., 277 volts or 120 volts). The same applies to dc or single-phase, 3-wire systems where there are two voltages.

Voltage, Nominal. A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (e.g., 120/240 volts, 480Y/277 volts, 600 volts). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment. *See related ROP*

Informational Note: See ANSI C84.1-2006, *Voltage Ratings for Electric Power Systems and Equipment (60 Hz)*.

For a list of nominal voltages to use in computing branch-circuit and feeder loads, see **220.5(A)**.

Voltage to Ground. For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

The voltage to ground of a 480/277-volt wye system would be 277 volts; of a 208/120-volt wye system, 120 volts; and of a 3-phase, 3-wire ungrounded 480-volt system, 480 volts.

For a 3-phase, 4-wire delta system with the center of one leg grounded, there are three voltages to ground — that is, on a 240-volt system, two legs would each have 120 volts to ground, and the third, or “high,” leg would have 208 volts to ground. See **110.15**, **230.56**, and **408.3(E)** for requirements pertaining to special markings and arrangements on such circuit conductors.

Watertight. Constructed so that moisture will not enter the enclosure under specified test conditions.

Unless an enclosure is hermetically sealed, it is possible for moisture to enter the enclosure. See the requirements related to watertight enclosures in **110.28** and **Table 110.28** and the additional information given in the accompanying commentary.

Weatherproof. Constructed or protected so that exposure to the weather will not interfere with successful operation.

Informational Note: Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

For requirements and more information on enclosures considered to be weatherproof based on exposure to specific environmental conditions, see **110.28** and the accompanying commentary, as well as **Table 110.28** and its informational note.