APPENDIX A

DEFINITIONS

AC/DC—means current that is often described as being either alternating current (AC) or direct current (DC). These terms refer to how the current varies in time.

- Alternating current is any current that reverses direction repeatedly; almost always this takes the form of a sine wave. Alternating current pulses back and forth within a conductor without the charge moving any net distance over time. The time-averaged value of an alternating current is zero, but it delivers energy in first one direction, and then the reverse.
- Direct current, as produced from a battery and required by most electronic devices, is a unidirectional flow from the positive part of a circuit to the negative. If, as is most common, this flow is carried by electrons, they will be travelling in the opposite direction.

Amperes—means the measurement used to determine the rate at which electrons move through a conductor as current.

Arc Flash Boundary (AFB)—means the safe approach distance from energized equipment or parts. NFPA 70E establishes the default arc flash boundary at 4 feet for low voltage (< 600V) systems where the total fault exposure is less than 5000 amperes-seconds (fault current in amperes multiplied by the upstream device clearing time in seconds). NFPA 70E also allows the AFB to be calculated. In some instances, calculations may decrease the boundary distance. Persons crossing into the arc flash boundary are required to wear the appropriate PPE as determined by calculating methods contained in NFPA 70E. In addition, a qualified person must accompany unqualified persons. The boundary is defined by NFPA 70E as the distance at which the worker is exposed to 1.2 cal/cm^2. IEEE Std 1584 - 2002 details the procedure and needed equations for arc flash calculations. The equations are used to calculate the incident energy and flash boundary. The IEEE procedure is valid for voltages ranging from 208V volts to 15kV with gap ranges between 3 mm. and 153 mm.

Clearance Distance—means the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive. Distance is measured from the live part if exposed, or from the enclosure front or opening if the live part is enclosed.

Conductor—means the wire that encases the electrical current that is the movement of electrons.

Contractor—means a contractor's firm or its representative hired from outside the College.

Corona Discharge—means an electrical discharge brought on by the ionization of a fluid surrounding a conductor that is electrically energized. The discharge will occur when the strength of the electric field around the conductor is high enough to form a conductive region, but not high enough to cause electrical breakdown or arcing to

nearby objects. It is often a pale-blue colored haze, a buzzing sound emanating from sharp metal points in the circuit, or the odor of ozone.

District—means the Portland Community College campuses, centers, and locations in the Portland Metropolitan District**.**

Electrical System—means the installation and utilization of electrical equipment installed or used within or on buildings, structures, and other premises; and the electrical safety-related work practices.

Electrons—means the subatomic particles that have a negative electric charge. All matter has electrons. In metals, there are free electrons that are only loosely bound to their parent atoms. When a voltage is applied to such a metal, these free electrons are forced to move through the metal, resulting in the conduction of current.

Emergency Guide—means the Emergency Guide established for each campus/center to aid in an emergency at that site. See: Public Safety - Resources: Emergency Guide.

Exposed Live Parts—means those parts not suitably guarded, isolated, or insulated and capable of being inadvertently touched or approached nearer than a safe distance by an individual.

FMS—means the College's Facilities Management Services that is the centralized department with the responsibility for maintaining a healthy and safe physical environment through its maintenance, custodial, and grounds operations throughout the District.

FR—means Flame Retardant which are compounds added to manufactured materials, such as plastics and textiles, and surface finishes and coatings that inhibit, suppress, or delay the production of flames to prevent the spread of fire. The compounds may be mixed with the base material (additive flame retardants) or chemically bonded to it (reactive flame retardants).

GFCI—means a Ground Fault Circuit Interrupter that is a fast acting circuit breaker that senses small current leakage to ground and shuts off the electricity and interrupts its faulty flow to ground. Its protection is from line-to-ground fault, and provides additional protection against fires, overheating, and destruction of insulation on wiring. It will not protect an employee from line-to-line contact hazard (e.g., when a person holds two "hot wires" or a hot and neutral wire in each hand).

IEEE—means the Institute of Electrical and Electronics Engineers whose purpose is "*scientific and educational, directed toward the advancement of the theory and practice of Electrical, Electronics, Communications, and Computer Engineering as well as Computer Science.*"

Incident—means any unplanned action or event that may result in personal injury to an employee or student; or may result in damage to College property.

Limited Approach Boundary—means the NFPA 70E definition that is: "*a shock protection boundary to be crossed only by a qualified person (at a distance from a live part); which is not to be crossed by an unqualified person unless escorted by a qualified person*."

The limited approach boundary is the minimum distance from the energized item where unqualified personnel may safely stand. No untrained personnel may approach any

closer to the energized item than this boundary. The boundary is determined by NFPA 70E Table 2-1.3.4 and is based on the voltage of the equipment (2000 edition). A qualified person must use the appropriate PPE and be trained to perform the required work to cross the limited approach boundary and enter the *limited space*.

Live—means a continual stream of power or energy that is coursing through a circuit or conductor.

Lockout—means the placement of a lock on an energy isolating device in accordance with an established procedure.

Lockout Device—means the device that utilizes a lock and key to hold an energy isolating device in the safe position for the purpose of protecting personnel. The lockout device ensures that the equipment being controlled cannot operate until the lockout device has been removed.

NFPA 70E—means the National Fire Protection Association 70E-2000 requirements for safe work practices to protect personnel by reducing exposure to major electrical hazards.

Nominal Voltage—means the value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as: 120 or 240). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of the equipment.

OAR—means the State of Oregon Administrative Rules.

OHM—means a unit of resistance, and is symbolized by the Greek letter Ω; it was named in honor of Georg Ohm. 1 Ω is the resistance that will produce a potential difference of one volt in response to a current of one amp. Ohm's law is a basic law of circuit theory, stating that the current passing through a resistance is directly proportional to the potential difference across it. The resistance of most materials is relatively constant over a range of temperatures and currents.

OR-OSHA—means the State of Oregon Occupational Safety and Health Administration. (OSHA Permit Required Space Rules 1910.146).

Occupational Illness—means any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It may include acute and chronic illness or disease which may be caused by inhalation, absorption, ingestion, or direct contact.

Overload Protection—means the rated current capacity of conductors and equipment that must be sufficient for the design currents to which they will be subjected. Over-current protection equipment (e.g., fuses, automatic circuit breakers, thermal overload relays) shall be installed to disconnect the system in the event of an overload. If breaking capacity is not adequate, arcing may occur and cause fire and explosion damage with injury to workers.

Public Safety—means the College's Public Safety department that promotes a safe and secure campus community through the delivery of personal and facility security, crime prevention services, public safety communication, a disaster preparedness program, emergency medical services, and public assistance.

Qualified Electrical Worker—means an authorized, trained, and licensed electrician or limited licensed electrician who is permitted to work on or near exposed energized parts. In order to be considered a qualified electrical worker, he or she must be trained, at a minimum, in the following:

- The skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment;
- The skills and techniques necessary to determine the nominal voltage of exposed live parts;
- The knowledge of clearance distances specified in 1910.333(c) and the corresponding voltages to which the qualified person will be exposed.

Safety & Risk Services a.k.a. Risk Management—means the College's Safety & Risk Services department authorized through PCC Board Policy—B507 to maintain a safe and healthy work and educational environment for its employees, students, and visitors by educating, training, and auditing safety issues throughout the College District.

SDS—means the materials Safety Data Sheets (SDS) issued by the manufacturers of chemicals. The sheets are stored in the College's SDS program accessed through the College's Intranet. The software is a product of IHS Global Inc. (Dolphin).

Sine Wave or **Sinusoid**—means the mathematical curve that describes a smooth repetitive oscillation. It is named after the function sine, of which it is the graph. It occurs often in pure and applied mathematics.

Tagout—means the placement of a tag on equipment to indicate that the equipment shall not be operated until the tag is removed. A Tagout is a warning and communication device only; it is not intended to provide the physical restraint on those devices that are provided by a lock.

Tagout Device—means the prominent warning device that is capable of being securely attached and that, for the purpose of protecting equipment and/or products, forbids the operation of controlled equipment.

TSS—means the College's Technology Solutions Services that supports enterprise and campus computing and telephone needs.

Voltage—means the force or pressure that moves electrons through a circuit or conductor; it can be either a battery or a generator.

Voltage Designation—means one of the following:

- Low Voltage: less than 0.75 kilovolts
- High Voltage: between 0.75 and 230 kilovolts
- Extra High Voltage: over 230 kilovolts