NC STATE UNIVERSITY

NORTH CAROLINA
ELECTRIC METER SCHOOL
AND GRID TECHNOLOGY
CONFERENCE

Glossary of Terms For the Electric Utility Industry

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10BaseT –

A synonym for the Fast Ethernet network standard. The "10" refers to a maximum data-transfer rate of 10 megabits per second over twisted pair, copper wire.

10K -

A grade level Box or Cover rating. See "Incidental Light Traffic".

1A -

1 Normally Open

1B -

1 Normally Closed

20A -

A California ruling that has the investor owned utilities performing the under-grounding of electrical cables. The funds to perform the work are derived from rates and go into a sinking fund that is used at the discretion of the municipality the electric line is in.

20B -

A California ruling that has the investor owned utilities performing the under-grounding of electric cables. The funds to perform this work are derived from a combination of rates and the developer of the land the line is on. This work is done at the discretion of the municipality the electric line is in.

20C -

A California ruling that has the investor owned utilities performing the under-grounding of overhead electrical cables. The funds to perform this work are derived from the developer of the land the line is on.

20K -

A grade level Box or Cover rating. See "Occasional Traffic".

2S1W -

Two Speeds, 1 winding (motor).

2S2W -

Two Speed, 2 winding (motor).

2-Wire -

A pulse transmission system that uses 2 wires and usually transmits positive-going pulses of some duration with a rest (or zero voltage level) between pulses. Historically, this type of pulse system lacked immunity to induced noise. Filtering techniques of the receiving equipment will determine noise immunity. "2-Wire" is usually synonymous "Form A" in pulse metering is represented as a SPST-NO switch configuration.

3-Wire -

A pulse transmission system that employs 3 wires and has a signal on the common to one of the two contacts at all times, but never simultaneously to both. This type of system is much less prone to noise than a 2-wire system because a signal is always present. "3-Wire" is usually synonymous "Form C" in pulse metering and is represented as a SPDT switch configuration.

3 Phase -

See "Three Phase" and "Polyphase"

600 Volt -

Electrical systems, cables or service designed to be operated under 1000 Volts.

600V-UD -

600 Volt Underground Distribution Cable.

802.11a -

A specification for a wireless LAN that operates in the 5GHz frequency range and provides a data transmission rate of 54Mbps using spread spectrum technology.

802.11b -

A specification for a wireless LAN that operates in the 2.4GHz range and provides a data transmission rate of 11Mbps using spread spectrum technology. This specification was known as Wi-Fi but the term now applies to 802a and 802g as well.

802.11g -

A specification for a wireless LAN that operates in the 2.4GHz frequency range and provides a data transmission rate, over short distances, of 54Mbps using orthogonal frequency division multiplexing (OFDM) technology.

802.1x -

A security standard for wired and wireless LANs.

A

A -

1) Amperes; Amps. 2) Area. For cables Area is expressed in Circular Mils.

A-H -

Ampere-Hour

A/D Conversion –

The process of converting an analogue signal into an equivalent digital one utilizing an A/D converter.

AA -

1) The Aluminum Association. 2) Refers to All Aluminum as in All Aluminum Conductor.

AAAC -

All Aluminum Alloy Conductor

AAC -

All Aluminum Conductor.

AAC/TW -

All Aluminum Conductor, Trapezoidal-Shaped Aluminum Strands.

AASHTO -

American Association of Safety Highway Traffic Officials

Absorbed Glass Mat –

Absorbed Glass Mat, also known as AGM, is a newer type of battery construction that uses saturated absorbent glass mats rather than gelled or liquid electrolyte. It is somewhat more expensive than flooded (liquid) type.

AC -

See "Alternating Current"

ACAR -

All Aluminum Conductor, Aluminum Alloy Reinforced.

ACB -

Air Circuit Breaker

Access Point –

A wireless networked device usually connected to a wireless LAN used to access the wired LAN.

Accuracy -

The degree of uncertainty for which a measured value agrees the ideal value.

Accuracy Class –

A number used to indicate the accuracy range of a measurement transducer, according to the defined standard.

ACSR -

Aluminum Conductor Steel Reinforced.

ACSR/AW -

Aluminum Conductor, Aluminum Clad Steel Reinforced.

ACSR/TW –

ACSR conductor made using Trapezoidal Wire construction.

ACSS -

Aluminum Conductor Steel Supported. This is a conductor that is generally used for overhead transmission construction. ACSS is often preferred over ACSR because of its superior sag characteristics.

ACSS/AW -

Aluminum Conductor, Aluminum Clad Steel Supported.

ACSS/TW –

ACSS conductor made using Trapezoidal Wire construction.

Active Material (Battery) –

Material which reacts chemically to produce electrical energy when the cell discharges. The material returns to its original state during the charging process.

Active Power –

A term used for power when it is necessary to distinguish among Apparent Power, Complex Power and its components, and Active and Reactive Power.

Adjustment –

The operation intended to bring a transducer into a state of performance suitable for its use.

Admittance –

The reciprocal of Impedance (1/Z).

ADSL –

Asymmetric Digital Subscriber Line. ADSL uses standard phone lines to provide high speed data communications. ADSL upstream speeds (from the user) normally top out at 128Kbps and downstream (to the user) at no more than 1.5Mbps. A separate phone line is not required for ADSL Service.

AEIC -

Association of Edison Illuminating Companies. [www.aeic.org]

Aeolian Vibration –

A natural forced vibration caused by wind flowing over a conductor. This occurs at alternate wind induced vortices and at wind speeds typically at 8 to 12 MPH. Contact Young & Company for additional information including the formula to calculate Aeolian Vibration.

Aerial Cable –

An assembly of insulated conductors installed on a pole or similar overhead structures. It may be self-supporting or attached to a messenger cable.

AFCI -

Arc Fault Circuit Interrupter

AFD -

Adjustable Frequency Drive

AFI -

Arc Fault Interrupter

AGM -

See "Absorbed Glass Mat"

AIC -

Arc Interrupting Current

Air Blast Breakers –

A variety of high voltage circuit breakers that use a blast of compressed air to blow-out the arc when the contacts open. Normally, such breakers only were built for transmission class circuit breakers.

AIS –

Air Insulated Switchgear

Air Terminals –

Also called “Lightning Rods” are found bolted to the substation superstructure immediately next to the equipment they are meant to protect.

Al –

The chemical symbol for aluminum.

Alarm -

A signal for attracting attention to some abnormal event.

ALJ -

Administrative Law Judge

All-or-Nothing Relay -

An electrical relay which is intended to be energized by a quantity, whose value is either higher than that at which it picks up or lower than that at which it drops out.

Alley Arm –

A side brace for a cross arm that is not loaded (balanced) evenly.

Alley Roadway (Lighting) –

Narrow public ways within a block, generally used for vehicular access to the rear of abutting properties.

Alligator –

A specialized tool attached to a hot stick used to tie a wire or cable into an insulator.

Alloy –

A metal formed by the combination of two or more metals.

Alternating Current –

An electric current that reverses direction at regular intervals, having a magnitude that varies continuously in a sinusoidal manner.

Ambient Temperature –

The temperature surrounding an object.

American Wire Gage (AWG) –

A standard system used in the United States for designating the size of an electrical conductor based on a geometric progression between two conductor sizes.

AMF (Lighting) –

Average Maintained Foot-candles

Amorphous Semiconductor –

A non-crystalline semiconductor material used in photovoltaic panel construction. It is easier and less costly to manufacture than crystalline, but is less efficient and degrades over time. It is also known as thin film.

Ampacity –

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

Ampere –

The unit expressing the rate of flow of an electric current. One ampere is the current produced by a difference in potential of one volt across a resistance of one ohm; an electric current flowing at the rate of one coulomb per second.

Ampere-Hour –

The use of one Ampere for one hour.

Ampere-hour capacity (storage battery) –

The number of ampere-hours that can be delivered under specified conditions of temperature, rate of discharge, and final voltage.

Ampere-hour meter –

An electric meter that measures and registers the integral, with respect to time, of the current of a circuit in which it is connected.

Analog Panel Meters –

Receive a representative value from the substation CTs or PTs and indicate real time voltage and amperage levels.

Anchor –

A device that supports and holds in place conductors when they are terminated at a pole or structure. The anchor is buried and attached to the pole by way of guy wire to counteract the mechanical forces of these conductors.

Anneal –

The process of controlled heating and cooling of a metal. In wire and cable products, copper and aluminum are annealed to increase flexibility while maintaining adequate strength.

Anode –

1) The positive electrode that emits positive ions and attracts negative ions, within a voltaic cell or other such device. 2) The positive pole of a battery.

ANSI –

American National Standards Institute. ANSI is located at 1430 Broadway, New York, NY 10018.

Antenna Gain –

An antenna's transmission power, provided as a ratio of its output (send) signal strength to its input (receive) signal strength, normally expressed in dBi. The higher the dBi, the stronger the antenna.

Anti-Pumping Device –

A feature incorporated in a Circuit Breaker or re-closing scheme to prevent repeated operation where the closing impulse lasts longer than the sum of the relay and CB operating times.

Apparent Power (volt-amps) –

The product of the applied voltage and current in an ac circuit. Apparent power, or volt-amps, is not the true power of the circuit because the power factor is not considered in the calculation.

AR –

Automatic Recloser.

Arc –

A discharge of electricity through air or a gas.

Arc Flash –

An arcing fault is the flow of current through the air between phase conductors or phase and neutral or ground. An arcing fault can release tremendous amounts of concentrated radiant energy at the point of the arcing in a small fraction of a second resulting in extremely high temperatures, a tremendous pressure blast, and shrapnel hurling at high velocity.

Arc Thermal Performance Value –

Maximum capability for arc flash protection of a particular garment or fabric measured in calories per square centimeter. Though both garments and fabrics can be used for protection a garment made from more than one layer of arc flash rated fabric will have a calorie per square centimeter rating greater than the sum of the ATPV rating of the original fabrics. The calorie per square centimeter rating of most are flash protective Suits, coveralls and coats is commonly sewn into the fabric in large letters.

Arcing Time –

The time between instant of separation of the CB contacts and the instant of arc excitation.

Armor –

An outer metal layer applied to a cable for mechanical protection. Armor is comprised of factory formed wire, designed to be applied to a range of conductor sizes. Preformed Line Products manufacturers Armor.

Armor Rod –

An outer metal layer applied to a cable for mechanical protection. Armor Rods are comprised of factory formed wire, designed to be applied to a range of conductor sizes. Preformed Line Products manufacturers Armor Rods.

Array –

For photovoltaic systems, a number of photovoltaic modules connected together to provide a single electrical output. Also see "Photovoltaic Array".

Arrester –

Short for Surge Arrester, a device that limits surge voltage by diverting it.

Askeral –

A generic term for a group of synthetic, fire-resistant, chlorinated aromatic hydrocarbons used as electrical insulated fluids.

ASTM –

American Society for Testing and Materials. ASTM is located at 1916 Race Street, Philadelphia, PA 19103.

ATC -

Available Transfer Capacity

ATP -

Alternative Transient Program

Automatic line sectionalizer –

A self-contained circuit-opening device that automatically opens the main electrical circuit after sensing and responding to a predetermined number of successive main current impulses.

Automatic Recloser –

An automatic switch used to open then reclose following an over current event on a distribution voltage (medium voltage) line.

Autonomous Photovoltaic System –

A stand-alone Photovoltaic system that has no back-up generating source. The system may or may not include storage batteries.

Autotransformer –

A transformer in which at least two windings have a common section. They are used to either "buck" or "boost" the incoming line voltage.

Auxiliary Power –

The power required for correct operation of an electrical or electronic device, supplied via an external auxiliary power source rather than the line being measured.

Auxiliary Relay –

An all-or-nothing relay energized via another relay. An example is a measuring relay, for the purpose of providing higher rated contacts, or introducing a time delay, or providing multiple outputs from a single input.

Average Maintained Foot-candles (Lighting) –

(ILL x CU x LLF)/ (PS x RW)

AWG –

American Wire Gauge.

Azimuth –

The angle between true north and the projection of a surface normal to the horizontal plane, measured clockwise from the north. As applied to a Photovoltaic array, 180 degrees azimuth means the array faces south.

B

Baker Board –

A platform used to work above the ground on a wood pole.

Balanced Load –

Refers to an equal loading of the phases in a polyhphase system (current and phase angle).

Balanced polyphase system –

A polyphase system in which both the currents and voltages are symmetrical.

Ballast –

A device that by means of inductance, capacitance, or resistance, singly or in combination, limits the lamp current of a fluorescent or high intensity discharge lamp. It provides the necessary circuit conditions (voltage, current and wave form) for starting and operating the lamp.

Bandwidth –

The data carrying capacity of a transmission path, measured in bits or bytes per second.

Bank –

A group of electrical devices, usually transformers or capacitors, connected in a way to increase capacity.

Bar-type CT –

Commonly used on the load side of substation transformers and are normally the first connection from the transformer secondary bushings.

Basic impulse level (BIL) –

A reference impulse (voltage) insulation strength expressed in terms of the peak value of the withstand voltage of a standard impulse voltage wave. It is used to express the ability of electrical equipment such as transformers to withstand certain levels of voltage impulses like lightening strokes.

Basic Insulation Level –

A design voltage level for electrical apparatus that refers to a short duration (1.2 x 50 microsecond) crest voltage and is used to measure the ability of an insulation system to withstand high surge voltage.

Battery –

A combination of two or more chemical cells connected together electronically to produce electrical energy.

Battery Tray –

A container with a base and walls for holding several cells or batteries.

Bay-O-Net –

A fusing device frequently used to protect transformers and downstream devices. A Bay-O-Net fuse may include a Partial Range Current Limiting Fuse in series with an under oil fuse link.

Beacon –

In wireless networking, a beacon is a packet sent by a connected device to inform other devices of its presence and readiness.

Beam Spread –

With regard to outdoor light, the angle between the two directions in a plane in which the intensity is equal to a stated percentage of the maximum beam intensity. The percentage is typically 10% for floodlights and 50% for roadway luminaries.

Belt –

Refers to a lineman's climbing belt.

Bias Current –

The current used as a bias quantity in a biased relay.

Biased Relay –

A relay in which the characteristics are modified by the introduction of some quantity, and which is usually in opposition to the actuating quantity.

Bikeway (Lighting) –

Any road, street, path or way that is specifically designated as being open to bicycle travel, regardless of whether such facilities are designed for the exclusive use of bicycles.

BIL –

1) See Basic Insulation Level. 2) See Basic Impulse Level.

Blackout –

The complete interrupting of load to an electric utility customer or group of customers to reduce overall load on the system.

Blowing –

The act of installing fiber optic cable into a duct using air pressure.

Bluetooth –

A wireless computing and telecommunications specification that defines how mobile personal computing devices work with each other and with regular computers and phone systems within a close range.

Bonding –

The permanent joining of metallic parts to form an electrically conductive path that will ensure electrical continuity and the capacity to conduct any current to be present in a safe manner.

Boomer –

A lineman that moves from job to job.

Boost Charge –

A charge applied to a battery which is already near a state of full charge, usually of short duration.

Booster Transformer –

A current transformer whose primary winding is in series with the catenary and secondary winding in the return conductor of a classically-fed A.C. overhead electrified railway.

Breakdown Voltage –

The voltage at which a dielectric material fails.

Breaker –

See "Circuit breaker".

Brownout –

Refers to a reduction of voltage on the system. This effectively dims the lights. Systems in the eastern parts of the U.S. where networks are integrated use brownouts as a means of conserving energy.

Buck –

The act of lowering the voltage.

Bucket –

A basket or platform that supports one or more linemen attached to a boom of a truck.

Bucket Truck –

An aerial lift truck used to lift men high enough to work on overhead lines.

Building Wire –

Conductors and cables used in commercial building construction.

Bulb –

The outer enclosure of a light source; usually glass or quartz.

Bulb Envelope Lighting –

The outer enclosure of a light source; usually glass or quartz.

Bull Line –

Heavy line used to pull wire or cable into a conduit or into an overhead configuration.

Bull Wheel –

A reel device used to hold tension during the wire installation process.

Bunched Stranding –

A term applied to a number of wires twisted together in one direction in one operation without regard to their geometric arrangement.

Bundle –

Multiple cables used to form one phase of an overhead circuit.

BURD –

Buried Urban Residential Distribution.

Burden –

A term related to the accuracy of CTs. Like its name indicates it places a burden of the maximum allowable load on the CT. Load imposed by an electronic or electrical device on the measured input circuit, expressed in volt-amps.

Buried Urban Residential Distribution –

Refers to the system of electric utility equipment installed below grade.

Bus –

A conductor, which may be a solid bar or pipe, normally made of aluminum or copper, used to connect one or more circuits to a common interface. An example would be the bus used to connect a substation transformer to the outgoing circuits.

Bushing –

An insulator having a conductor through it, used to connect equipment to a power source.

Bushing-type CT –

Used for metering and controlling the current as it leaves the transformer.

Bushing Well –

See Universal Bushing Well.

C

C –

Centigrade or Celsius

C-Rate –

Battery discharge current in amperes; numerically equal to rated capacity of a cell in ampere-hours.

C2H4 –

Ethylene.

C2H6 –

Ethane.

Cable –

A term generally applied to the larger sizes of bare or weatherproofed (covered) and insulated conductors. It is also applied to describe a number of insulated conductors twisted or grouped together.

Cable Cleaner –

A chemical compound used to clean dirt, residual insulation & semi con and other foreign material from an insulated cable during the termination process.

Cable Pulling Lubricant –

A chemical compound used to reduce pulling tension by lubricating a cable when pulled into a duct or conduit.

Cable Sheath –

The outermost covering of a cable providing overall protection.

Cable Tray –

A rigid structural system used to support cables and raceways. Types of cable trays include ladder, ventilated trough, ventilated channel, and solid bottom.

CAIDI –

A distribution circuit reliability average interruption duration index. It represents the average time required to restore service to the average customer per sustained interruptions.

CAIFI –

The customer average interruption frequency index. It is designed to show trends in customers interrupted and helps to show the number of customers affected out of the whole customer base.

Cal-ISO -

See California Independent System Operator.

Calibration –

Adjustment of a device so the output is within a specified range for particular values of the input.

California Independent System Operator (Cal-ISO) –

The FERC-regulated control area operator of the California transmission grid. Its responsibilities include providing nondiscriminatory access to the grid, managing congestion, maintaining the reliability and security of the grid, and providing billing and settlement services. Cal-ISO is based in Folsom, CA near Sacramento, with a backup control site in Alhambra, CA.

California Power Exchange (CalPX) –

Now defunct, this independent California agency was responsible for conducting an auction for the generators seeking to sell energy and for loads that are not otherwise being served by bilateral contracts. The CalPX was responsible for scheduling generation in its day-ahead and hour ahead markets, for determining hourly market-clearing prices and for settlement and billing for suppliers and utility distribution companies (UDC's) using the PX's market.

California Public Utilities Commission (CPUC) –

Headquartered in San Francisco, the CPUC regulates telecommunications, electric, natural gas, water, railroad, and rail transit and passenger transportation companies. The CPUC is chartered by the State of California to assure consumers have safe, reliable utility service at reasonable rates.

Calorie –

A calorie is the energy required to raise one gram of water one degree Celsius at one atmosphere. The onset of second-degree burns may occur at 1.2 calories per centimeter squared per second. One calorie per centimeter squared per second per second can be equal to holding your finger over the tip of the flame of a cigarette lighter for one second.

Can -

Slang for an overhead transformer.

Candela (cd) –

The standard unit for luminous intensity. One candela is equal to one lumen per steradian.

Candlepower –

Luminous intensity expressed in candelas.

Candlepower Distribution Curve –

A curve, generally polar, representing the variation of luminous intensity of a lamp or luminaire in a plane through the light center.

Capacitance –

1) The ratio of an impressed charge on a conductor to the corresponding change in potential. 2) The ratio of the charge on either conductor of a capacitor to the potential difference between the conductors. 3) The property of being able to collect a charge of electricity.

Capacitor –

An electrical device having Capacitance. A device that causes the voltage to lag behind the current.

Capacitor bank –

An assembly of capacitors and all necessary accessories, such as switching equipment, protective equipment, controls, etc., required for a complete operating installation.

Capacitor Ground Switch –

A solid blade switch that when closed will ground the common bus of a capacitor bank.

Capacitor Voltage Transformer –

A voltage transformer that uses capacitors to obtain a voltage divider effect. It is utilized at EHV voltages instead of an electromagnetic VT for cost and size purposes.

Capacity (Battery) –

The quantity of electricity delivered by a battery under specific conditions, usually expressed in ampere-hours.

Cascade-type PT –

Single high-voltage PTs with the primary winding distributed on several cores.

Cat 5 Cable –

See "Category 5 Cable"

Category 5 Cable –

Also known as "Cat 5", this cable is used for fast Ethernet and telephone communications. The cable is constructed of 4 twisted pair of copper wire.

Cathode –

1) The negative electrode, that emits electrons or gives off negative ions and toward which positive ions move or collect in a voltaic cell or other such device.
2) The negative pole of a battery.

CB –

Circuit Breaker

CCVT (capacitance coupled voltage transformer) –

A single-phase device which is constructed as a stack of small capacitors connected in series.

CDMA –

Code Division Multiple Access. CMDA is a technique used mainly with personal communications devices such as mobile phones that digitizes the conversation and tags it with a special frequency code. The data is then scattered across the frequency band. The receiving device is instructed to decipher only the data corresponding to a particular code to reconstruct the signal.

Cell (Battery) –

An electrochemical device composed of positive and negative plates, separator, and electrolyte which are capable of storing electrical energy.

Cell (Photovoltaic) –

See "Photovoltaic Cell".

Cell Voltage (Battery) –

See "Nominal Voltage (Battery)".

Cell-Reversal (Battery) –

Reversing of polarity within a cell of a multi-cell battery due to over discharge.

CH2H2 -

Acetylene

CH4 -

Methane.

Characteristic Angle –

The angle between the vectors representing two of the energizing quantities applied to a relay used for the declaration of the performance.

Characteristic Curve –

A plot or curve displaying the operating values of the characteristic quantities corresponding to various values or combinations of the energizing quantities.

Characteristic Impedance Ratio (C.I.R.) –

The maximum value of the system impedance ratio for which the relay performance remains within the prescribed limits of accuracy.

Charge (Battery) –

The conversion of electrical energy from an external source, into chemical energy within a cell or battery.

Charge Controller –

An electronic device which regulates the voltage applied to a battery or battery bank.

Charge Rate (Battery) –

The rate at which current is applied to a secondary cell or battery to restore its capacity.

Charge-Retention (Battery) –

The tendency of a charged cell or battery to resist self-discharge.

Check Protection System –

An auxiliary protection system intended to prevent tripping due to inadvertent operation of the main protection system.

Cherry Picker –

An aerial lift truck. Also see Bucket Truck.

Chlorinated Polyethylene –

Chlorinated Polyethylene. CPE, a thermoplastic compound, is used to jacket certain types of power cable.

Choker –

A Sling.

Circuit –

A conductive path over which an electric charge may flow.

Circuit Breaker –

A device that can be used to manually open or close a circuit, and to automatically open a circuit at a predetermined level of over current without damage to itself.

Circuit Insulation Voltage –

The highest circuit voltage to earth on which a circuit of a transducer may be used and which determines its voltage test.

Circuit Switchers –

Circuit-Switchers are multipurpose switching and protection devices. Often used for switching and protection of transformers, single and back-to-back shunt capacitor banks, reactors, lines, and cables. They can close, carry, and interrupt fault currents as well as load currents.

Circuit Voltage –

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

Circular-Mil (cmil) –

The area of a circle with a diameter of one mil (1/1000 inch), used to describe the cross-sectional area of a conductor. One cmil equals approximately 0.0000008 square inches.

Class Index –

A number which designates an accuracy class.

Clearing Time –

The total time needed for a protective device such as a fuse or circuit breaker to clear a fault.

CLF –

Refer to "Current Limiting Fuse".

Client –

As part of a computer network, where a server is employed, this is the customer or non-server side. When you log onto a server, from another computer, the word "Client" refers to you, your computer or your software.

Climbers –

Hooks for climbing poles that are attached to a lineman's boots.

Closing Impulse Time –

The time during which a closing impulse is given to the circuit breaker.

Closing Time –

Referring to a circuit breaker it is the necessary time for it to close, beginning with the time of energizing of the closing circuit until contact is made in the CB.

CO –

Carbon Monoxide.

Coax Cable –

See "Coaxial Cable".

Coaxial Cable –

Also known as "Coax", this cable is typically used to connect TV to its video source. Coaxial Cable consists of a small copper wire or tube, surrounded by an insulating material and another conductor with a larger diameter, normally copper braid or a conductive tube. The cable is jacketed for mechanical and electrical protection.

Coefficient of Utilization (CU) –

The percentage of light generated within a luminaire which ultimately strikes the work surface. It is usually expressed as a decimal percentage.

Coffin Hoist –

A chain hoist of any type.

Coil Loss –

Power loss in a transformer due to the flow of current. These losses are present only when the transformer is serving a load. Load losses vary by the square of the current magnitude. Load losses are composed of losses due to the current flow through the resistance of the conductors as well as eddy losses in the windings and stray losses due to current flow through other components.

Cold –

Refers to non-energized equipment, lines or circuits.

Collector Roadway (Lighting) –

The distributor and collector roadways servicing traffic between major and local roadways. These are roadways used mainly for traffic movements within residential, commercial and industrial areas.

Combination Unilay –

A stranding configuration that uses two strand sizes to achieve a 3% reduction in the conductor diameter without compression.

Combination Watt-hour and Demand Meter –

A meter that registers load and also indicated or records maximum demand.

Come-a-long –

A wire grip for holding a conductor or strand under tension.

Commercial (Lighting) –

A business area of a municipality where there are ordinarily many pedestrians during night hours. The definition applies to densely developed business area outside, as well as within, the central part of a municipality. The area contains land use attracting a relatively heavy volume of nighttime vehicular and/or pedestrian traffic on a frequent basis.

Compact Stranding –

A stranding configuration with concentric strands in which each layer is passed through a compacting die to reduce the conductor diameter by approximately 10%.

Competition Transition Charge (CTC) –

A charge itemized on customer bills to recover costs associated with investor owned utility investments in generation-related assets and state-mandated contracts with nonutility generators that may now be uneconomic and unrecoverable in the restructured electric utility industry.

Compliance Voltage –

The specified maximum voltage that a transducer (or other device) current output must be able to supply while maintaining a specified accuracy.

Compound –

An insulating or jacketing material made by mixing two or more ingredients.

Compressed –

A stranding configuration with concentric strands in which either all layers or the outer layer only is passed through a die to reduce the conductor diameter by 3%.

Compression Splice –

A compression connector used to join two conductors. There are different designs used for overhead and underground conductors. For overhead conductors, there are different designs for limited and full tension applications.

Concentrator (Photovoltaic) –

See "Photovoltaic Concentrator".

Concentric Stranding –

A stranding configuration in which individual wires are stranded concentrically with no reduction in overall diameter. Typically used for bare conductors.

Conduct –

The ability of two conductors separated by a dielectric to store electricity when a potential difference exists between the conductors.

Conductivity –

The capability of a conductor to carry electricity, usually expressed as a percent of the conductivity of a same sized conductor of soft copper.

Conductor –

1) A wire or combination of wires suitable for carrying an electrical current. Conductors may be insulated or bare. 2) Any material that allows electrons to flow through it.

Conductor Loss –

See "Coil Loss".

Conductor Shield –

A semiconducting material, normally cross-linked polyethylene, applied over the conductor to provide a smooth and compatible interface between the conductor and insulation. This smooth semiconducting shield is at the same potential as the conductor resulting in dielectric field lines that are not distorted.

Conduit –

A channel for holding and protecting conductors and cables, made of metal or an insulating material, usually circular in cross section like a pipe. Also referred to as Duct.

Conduit Fill –

Volumetric measurement of the duct space occupied by the cables inside, expressed as a percent.

Conjunctive Test –

A parametric or specific test of a protection system on all components and auxiliary equipment that are connected.

Connector –

A conductive coupling device used to connect conductors together.

Constant Current Charge –

Charging technique where the output current of the charge source is held constant.

Constant Potential Charge –

Charging technique where the output voltage of the charge source is held constant and the current is limited only by the resistance of the battery.

Continuity Test –

A test performed on a conductor to determine if it is unbroken throughout its length.

Continuous –

See Continuous Rating.

Continuous Load –

An electrical load in which the maximum current is expected to continue for three hours or more.

Continuous Rating –

The constant voltage or current that a device is capable of sustaining. This is a design parameter of the device.

Conversion Coefficient –

The relationship of the value of the measured to the corresponding value of the output.

Coordination –

Relating to the protection of the power system, the process of coordinating the fuse, breakers and reclosers of a system so to allow the downstream devices to operate first.

Copolymer –

Chains of unlike molecules that are chemically bonded together.

Core Balance Current Transformer –

A ring-type current transformer in which all primary conductors are passed through the aperture making any secondary current proportional to any imbalance in current.

Core Loss –

Power loss in a transformer due to excitation of the magnetic circuit (core). No load losses are present at all times when the transformer has voltage applied. No load losses vary based on the applied voltage, and are essentially constant whether the transformer is supplying a load or not.

Corona –

The electrical effect that occurs when the voltage breaks down the insulating value of the air around it. More commonly found on Ultra High Voltage lines and equipment.

Corona Discharge –

An electrical discharge at the surface of a conductor accompanied by the ionization of the surrounding atmosphere. It is normally accompanied by light and audible noise.

Corona Ring –

An aluminum ring that is attached to equipment or phase dead-ends to spread out the corona effect. The ring prevents the corona effect from breaking down the air and establishing an ionized path to ground.

Coulomb –

A unit of electric charge in SI units (International System of Units). A Coulomb is the quantity of electric charge that passes any crossection of a conductor in one second when the current is maintained constant at one ampere.

Counter EMF –

Voltage or cell or battery opposing the voltage of the charging source.

Counting Relay –

A relay that counts the number of times it is energized and actuates an output after a desired count has been reached.

Cover –

Top surface section of the hand hole for closing the top access opening of the box section.

CPE –

Chlorinated Polyethylene.

CPE is a thermoplastic compound that is used to jacket certain types of power cable.

CPUC –

See California Public Utilities Commission (CPUC).

Creepage Distance –

The shortest distance between two conductors as measured along the device that separates them. Creepage Distance is normally a design parameter of insulators or insulating bushings.

Crest –

See Crest Value.

Crest Value –

The maximum value of a wave form. This is normally associated with electrical fault magnitude or transients.

Cross-Linked Polyethylene (XLPE) –

A Common thermoset insulation material for building wire and cable Polyethylene made from petroleum and natural gas. It undergoes a crosslinking chemical reaction during a curing process that causes the compound molecules to bond, forming heavier molecules with desired physical and chemical properties.

CSA - Canadian Standards Association -

CSA is located at 178 Rexdale Blvd, Toronto, Ontario, Canada M9W 1R3.

CSP –

Completely Self-Protected transformer.

CST –

Customer Subsurface Transformer.

CSV –

Character (or Comma) Separated Values Format, format widely utilized for the exchange of data between different software, in which the data are separated by a known character usually a comma.

CT –

See "Current Transformer".

CTC –

See Competition Transition Charge.

Cu –

The chemical symbol for copper.

CU (Lighting) –

Coefficient of Utilization

Current –

1) The movement of electrons in a conductor measured in Amperes. 2) Also see Ampere.

Current Leakage –

The current that tracks across any insulated device that is touching an energized source to ground. Leakage is usually measured in micro amps.

Current Limiting Fuse –

A fuse designed to operate at the current zero crossing. Also see "Zero Crossing".

Current Transducer –

A transducer used for the measurement of A.C. current.

Current Transformer –

A transformer used to measure the amount of current flowing in a circuit. Its primary winding is rated in excess of the expected current of the circuit and the secondary will normally be rated at 5 amps being equal to the nominal full primary current.

Current Transformer Ratio –

1) The ratio of primary amps divided by secondary amps. 2) The current ratio provided by the windings of the CT. For example, a CT that is rated to carry 200 Amps in the primary and 5 Amps in the secondary would have a CT ratio of 200 to 5 or 40:1.

Cut Off Voltage –

Battery Voltage reached at the termination of a discharge. Also Known as the End Point Voltage (EPV).

Cutoff (Lighting) –

Luminaire light distribution is classified as cutoff when the candlepower per 1000 lamp lumens does not numerically exceed 25 (2.5%) at an angle of 90 degrees above nadir (horizontal), and 100 (10%) at a vertical angle of 80 degrees above nadir. This applies to any lateral angle around the luminaire.

Cutoff Angle (Lighting) –

With regard to an outdoor lighting luminaire, the angle between the vertical axis and the first line of sight at which the bare light source is not visible.

Cutoff, Full (Lighting) –

A luminary light distribution with zero candela at an angle of 90 degrees or above and not more than 10% of emitted light above 80 degrees.

Cutoff, Non (Lighting) –

A luminary light distribution where there is no Candela restriction at any angle.

Cutoff, Semi (Lighting) –

A luminary light distribution with 5% candela at an angle of 90 degrees or above and not more than 20% of emitted light above 80 degrees.

Cutout –

See "Fused Cutout".

Cycle –

In Alternating current, the change of the poles from negative to positive and back.

Cycle (Battery) –

A sequence of discharge followed by a charge, or a charge followed by a discharge, of a battery under specific conditions.

D

DA Bolt –

A Double Arming Bolt.

Data Encryption Standard –

See "DES".

Day ahead market –

The forward market for the supply of electrical power at least 24 hours before delivery.

dB –

See "decibel".

dBi –

Decibels compared to an isotropic antenna. The higher the dBi, the stronger the antenna.

dBm –

Decibels compared to one milliwatt. The higher the dBm, the higher the devices transmit or receive power.

DC –

See "Direct Current".

DCF77 –

A LF transmitter located at Mainflingen, Germany, broadcasting a time signal on a 77.5 kHz frequency.

De-energized –

Free from any electrical connection to a source of potential difference and from electrical charge.

De-ionization Time –

The time required for dispersion of ionized air after a fault is cleared so that the arc will not re-strike on re-energization.

Dead Front –

Generally refers to equipment that is connected without exposed conductor. Dead front equipment is normally connected with elbows. Thomas & Betts Elastimold division manufactures elbows and other medium voltage connection devices.

Dead Time –

The time between the fault arc being extinguished and the circuit breaker contacts re-mating.

Decibel –

A logarithmic mathematical ratio that indicates a devices electric or acoustic signal to that of another.

Deep Discharge (Battery) –

Withdrawal of 50% or more of the rated capacity of a cell or battery.

Delivery Traffic Indication Message –

See "DTIM".

Delta –

A three phase connection where each phase is connected in series with the next, separated by a phase rotation of 120 degrees.

Delta-Wye –

Refers to a transformer that is connected Delta on the primary side and Wye on the secondary.

Dependent Time Measuring Relay –

A measuring relay for which times depend, in a specified manner, on the value of the characteristic quantity.

Depth of Discharge –

The portion of the nominal capacity from a cell or battery taken out during each discharge cycle, expressed in percent. Shallow Depth of Discharge is considered as 10% or less. Deep Discharge is considered 50% or more.

Derating –

Calculations that reduce standard tabulated ratings based, generally based on ambient temperature or proximity to a heat source.

DES - Data Encryption Standard -

DES is an encryption, method that uses an algorithm for private key encryption, in which the sender uses the same private key as the recipient uses to decode it.

Design Load –

The actual, expected load or loads that a device or structure will support in service.

Design Test –

Tests done to equipment to verify the design meets certain established characteristics or standards.

Device Control Point –

Local keypad on device level to control the switchgear often combined with local or remote switch.

DFT –

Discrete Fourier Transform

DHCP –

Domain Host Control Protocol.

DHCP is a protocol used for dynamically assigning IP addresses to networked computers.

Dielectric –

1) Any electrical insulating medium between two conductors.
2) The medium used to provide electrical isolation or separation.

Dielectric Constant –

A number that describes the dielectric strength of a material relative to a vacuum, which has a dielectric constant of one.

Dielectric Grease –

A silicone based chemical compound used to seal and lubricate connections between medium voltage connectors such as cable termination elbows.

Dielectric Strength –

The maximum voltage an insulation system can withstand before breakdown, expressed in volts per mil of insulation thickness.

Dielectric Test –

A test that is used to verify an insulation system. A voltage is applied of a specific magnitude for a specific period of time.

Dielectric Withstand –

The ability of insulating materials and spacing's to withstand specified overvoltage's for a specified time (one minute unless otherwise stated) without flashover or puncture.

Dielectric Withstand Voltage Test –

The test to determine Dielectric Withstand.

Digital Signal Processing –

A technique for the processing of digital signals by various filter algorithms to obtain some desired output.

Digital Signal Processor –

A microprocessor optimized in hardware design and software instruction set for the processing of analog signals digitally. This is achieved by DFT and similar techniques.

Digital Subscriber Line –

See "DSL".

Dip Tolerance (Lighting) –

With regard to outdoor lighting, the percentage of instantaneous voltage variation from normal that is required to extinguish a light source.

Dipole Antenna –

A type of antenna commonly used in wireless networking devices. It has a signal range of 360 degrees horizontally and 75 degrees vertically.

Direct Current –

Electric current in which electrons flow in one direction only. Opposite of alternating current.

Direct Sequence Spread Spectrum –

See "DSSS".

Direct-on-Line –

A method of motor starting, which full line voltage is applied to a stationary motor.

Directional Relay –

A protection relay in which the tripping decision is dependent in part upon the direction in which the measured quantity is flowing.

Discharge (Battery) –

The conversion of the chemical energy of a cell or battery into electrical energy and withdrawal of the electrical energy into a load.

Discharge Current –

The surge current that is dissipated through a surge arrester.

Discharge Rate (Battery) –

The rate of current flow from a cell or battery.

Disconnect Switch –

A simple switch that is used to disconnect an electrical circuit. It may or may not have the ability to stop the flow of current in the circuit.

Discrimination –

The ability of a power protection system to differentiate between the conditions it was intended to operate and those it was not intended for.

Distortion Factor –

The ratio between the R.M.S. value of the harmonic content and the R.M.S. value of the non-sinusoidal quantity.

Distribution Automation –

A system consisting of line equipment, communications infrastructure, and information technology that is used to gather intelligence about a distribution system. It provides analysis and control in order to optimize operating efficiency and reliability.

Distribution System –

A term used to describe that part of an electric power system that distributes the electricity to consumers from a bulk power location such as a substation. It includes all lines and equipment beyond the substation fence.

Distribution Transformer –

A transformer that reduces voltage from the supply lines to a lower voltage needed for direct connection to operate consumer devices.

Distribution Voltage –

A nominal operating voltage of 1-38kV.

Disturbed Network Protocol –

A proprietary communication protocol used on secondary networks between HMI, substation computers or bay computers and protective devices.

DIS – Distribution Information System –

Used by some utilities as a Distribution Mapping System to inventory, label, and use for outage and engineering management purposes.

DMZ - Demilitarized Zone –

Networking has corrupted the term and used it to refer to an unprotected subnet connected to a local network, but outside the protection of a firewall.

DNS - Domain Name System –

The DNS is an international network of Internet domain name servers, names, and addresses that enables locating computers on the internet.

Dolly –

See "Stringing Block".

Domain Host Control Protocol –

See "DHCP".

Domain Name System –

See "DNS".

Door –

The fuse tube of a fused cutout.

Double Arming Bolt –

A special long bolt used to assemble two cross arms, one on each side of the pole.

Draw-Lead –

A cable or solid conductor that has one end connected to the transformer or a reactor winding and the other end drawn through the bushing hollow tube and connected to the top terminal of the bushing.

Drawing –

The process of reducing a cylindrical rod or wire to a desired diameter by pulling the wire through dies.

A term used for schematic diagram.

"Dry" Contacts –

A relay's contacts that have no electricity applied to them from the device in which they are incorporated. A voltage is supplied by an external device or system, usually the system that will receive the pulses. Dry contact outputs are the standard convention in pulse metering, and provide separation of circuits, voltage isolation and voltage translation between systems.

Drop-Out –

A relay drops out when it moves from the energized position to the un-energized position.

Dry Charge (Battery) –

The process by which the electrodes are formed and assembled in a charged state. The cell or battery is activated when electrolyte is added.

Dry-Type Transformers –

Transformers that use only dry-type materials for insulation. These have no oils or cooling fluids and rely on the circulation of air about the coils to provide necessary cooling. Such units are usually limited in size to a few hundred kVA because of problems of cooling the larger units.

DSL - Digital Subscriber Line –

A method to Lines carries data at high speeds over standard telephone lines.

DSSS –

Direct Sequence Spread Spectrum. Used in radion transmission, DSSS alters, or modulates, the signal by spreading it over a wider frequency, generating what seems like signal noise to anything except the device that is designed to reassemble the signal into its original form.

DTIM – Delivery Traffic Indication Message -

A DTIM is a signal sent as part of a beacon by an access point to a client device in sleep mode, alerting it that a packet of data awaits delivery.

Dual Voltage Switch –

A switch used to select primary windings of a transformer.

Dual Voltage Transformer –

A transformer that has switched windings allowing its use on two different primary voltages.

Duct –

A channel for holding and protecting conductors and cables, made of metal or an insulating material, usually circular in cross section like a pipe. Also referred to as Conduit.

Duct Bank –

Two or more ducts or conduits used as part of a system.

Dynamic DNS –

This is a system by which Internet Service Providers temporarily assign IP addresses. This allows the reassignment of the address when no longer in use.

E

Earth Fault Protection System –

A protection system which is designed to excite during faults to earth.

Earthing Transformer –

A three-phase transformer intended essentially to provide a neutral point to a power system for the purpose of grounding.

Eddy Current –

The current that is generated in a transformer core due to the induced voltage in each lamination. It is proportional to the square of the lamination thickness and to the square of the frequency.

EEI -

Edison Electric Institute.

[www.eei.org]

EERA –

Electrical Equipment Representatives Association. EERA is an association of electrical manufacturer's representatives. Additional information on EERA can be found at www.eera.org. Young & Company is a member of EERA.

Effective Internal Resistance (Battery) –

The apparent opposition to current within a battery that manifests itself as a drop in battery voltage proportional to discharge current. Its value is dependent on battery design, state-of-charge, temperature and age.

Effective Power (Watts) –

See "Watt"

Effective Range –

The range of values of the characteristic quantity or quantities. For example the energizing quantities to which the relay will respond and satisfy the requirements to precision.

Effective Setting –

The setting of a protection system including the effects of current transformers, this effective setting can be expressed in terms of primary current or secondary current from the current transformers.

Effectively Grounded –

Intentionally connected conductors or electric equipment to earth, where the connection and conductors are of sufficiently low impedance to allow the conducting of an intended current.

Efficiency (Lighting) –

A ratio of light emitted from a luminaire to the light produced by the bare lamp.

EHV –

See "Extra High Voltage".

Elbow –

A device used to connect a medium voltage cable (4-35KV nominal) to an electrical component such as a switch or transformer. Its name is derived from the fact that its shape is an "L". Elbows are available in ratings of 200, 600 and 900 Ampere.

Electrical Hazard –

A dangerous condition such that contact or equipment failure can result in electric shock, arc flash burn, thermal burn, or blast.

Electrical Relay –

A device designed to produce sudden predetermined changes in one or more electrical circuits after the appearance of certain conditions in the controlling circuit.

Electrical Safety –

Recognizing hazards associated with the use of electrical energy and taking precautions so that hazards do not cause injury or death.

Electrically Safe Work Condition –

A state in which the conductor or circuit part to be worked on or near has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to ensure the absence of voltage, and grounded if determined necessary.

Electricity –

The flow of electrons through a conducting medium.

Electrolyte (Battery) –

In a lead-acid battery, the electrolyte is sulfuric acid diluted with water. It is a conductor and also a supplier of hydrogen and sulfate ions for the reaction.

Electromechanical Relay –

An electrical relay in which the designed response is excited by a relative mechanical movement of elements under the action of a current in the input circuit.

Electromotive Force –

Potential causing electricity to flow in a closed circuit.

Elongation –

The amount (% length) that a conductor or other material can stretch before breaking when a pulling force is applied.

Embedded Generation –

Generation that is connected to a distribution system possibly at LV instead of HV.

EMS –

See Energy Management System

EMTDC™ -

Electro-Magnetic Transients for DC. Incorporates both EMTP and ATP, and integrates DC systems and components.

EMTP –

Electromagnetic Transients Program

End Point Voltage –

Battery Voltage reached at the termination of a discharge. Also Known as the Cut Off Voltage.

End-of-Discharge Voltage –

The voltage of a battery at the termination of a discharge but before the discharge is stopped.

End-Point Voltage –

The Cell or Battery voltage at which point the rated discharge capacity has been delivered at a specific Rate-of-Discharge. It is also used to specify the cell or battery voltage below which the connected equipment will not operate or below which operation is not recommended.

Energy –

That which does work or is capable of doing work. Electricity is energy that is measured in kilowatt hours.

Energy Management System –

A system in which a dispatcher can monitor and control the flow of electric power by opening and closing switches to route electricity or to isolate a part of the system for maintenance. It is also used to control the amount of generation needed to serve a load.

Entrainment (Battery) –

The process whereby gasses generated in the cell carry electrolyte through the vent cap.

EPDM –

Ethylene Propylene Dione Monimer. This is a synthetic rubber compound used as insulation in making electrical components.

EPR –

Ethylene Propylene Rubber, a synthetic rubber compound that is used as cable insulation.

EPRI –

Electric Power Research Institute. EPRI is located at P.O. Box 10412, Palo Alto, CA 94303.

EPROM –

Electrically Programmable Read Only Memory.

Eutectic –

An alloy used to form the melting point of a fuse. It is frequently silver or tin based.

Event –

In the digital world an event is any information acquired or produced by the digital control system.

Exciting Current –

The magnetizing current of a device such as a transformer. Also known a field current.

Expressway Roadway (Lighting) –

A divided major roadway for through-traffic with partial control of access and generally with interchanges at major crossroads. Expressways for non-commercial traffic within parks and park-like area are generally known as parkways.

Extension, Box –

An add-on section that fits to the bottom or to the top of a grade level box, extending its height.

Extra High Voltage –

An electrical system or cable designed to operate at 345kv (nominal) or higher.

Extrusion –

The application of a semi-solid rubber or plastic material such as PVC onto a conductor.

F

F -

Fahrenheit

FA –

Forced-Air, a cooling classification for transformers now classified as ONAF. Oil type, Forced circulation through cooling (i.e. cooling pumps) and natural convection flow in windings.

Farad –

The capacitance value of a capacitor of which there appears a potential difference of one volt when it is charged by a quantity of electricity equal to one coulomb.

FAT –

Factory acceptance test. Validation procedures witnessed by the customer at the factory.

Fault Close Rating –

The ability, in amps, of a switching device to "close" into a fault of specific magnitude, without excessive arcing.

Fault Current –

The current that flows as a result of a short-circuit condition.

Fault Indicator –

A device installed on a conductor to determine if current exceeded the indicator's current rating. Fault indicators sense using use the magnetic field induced by load current.

Federal Energy Regulatory Commission (FERC) –

FERC is an independent regulatory agency within the U.S. Department of Energy that approves rates for wholesale electricity transactions and transmission of electricity in interstate commerce for utilities, power marketers, power pools, power exchanges and independent system operators. FERC also regulates the transmission and sale for resale of natural gas in interstate commerce; regulates the transmission of oil by pipeline in interstate commerce; licenses and inspects private, municipal and state hydroelectric projects; and oversees related environmental matters. The FERC board of governors is composed of five commissioners. The chairman, designated by the President, serves as the commission's administrative head. FERC is based in Washington, D.C. (also see NERC, page 79)

Feeder –

A three phase distribution line circuit used as a source to other three phase and single phase circuits.

FERC –

Federal Energy Regulatory Commission.

Ferroresonance –

In transformers, an over-voltage condition that can occur when the core is excited through capacitance in series with the inductor. This is especially prevalent in transformers that have very low core losses. It can generally be prevented by having a load connected to the transformer secondary. Contact Young & Company or Howard Industries for additional information.

Fiducial Value –

A specified value to which reference is made in order to specify the accuracy of the transducer. For transducers the fiducial value is the span. For transducers having reversible or symmetrical outputs the fiducial value can be either the span or half the span as specified by the manufacturer.

Field Current –

The magnetizing current of a device such as a transformer. Also known as exciting current.

Fill –

In conduit or cable tray installations, the portion of the total cross-sectional area of the tray or conduit that can be occupied by conductors or cables.

Filler –

A material used in multiconductor cable to occupy large interstices formed by the cable assembly. Also, a material added to an insulation compound to add volume and increase impact resistance.

Fixed Capacitor Bank –

A capacitor bank installed with no automatic switching device. The bank is manually switched on and off. Also see "Capacitor Bank".

Fixture –

With regard to lighting, a reference to Luminaire.

Flame Resistance –

The ability of insulation or jacketing material to resist the support and conveyance of fire.

Flash Hazard –

A dangerous condition associated with the release of energy caused by an electric arc.

Flash Hazard Analysis –

A study investigating a worker's potential exposure to arc-flash energy, conducted for the purpose of injury prevention, the determination of safe work practices, and the appropriate levels of PPE.

Flash Protection Boundary –

An approach limit at a distance from exposed live parts within which a person could receive a second degree burn if an electrical arc flash were to occur.

Flash Suit –

A complete FR clothing and equipment system that covers the entire body, except for the hands and feet. This includes pants, jacket, and bee-keeper-type hood fitted with a face shield.

Flashover –

An unintended electrical discharge to ground or another phase. Flashovers can occur between two conductors, across insulators to ground or equipment bushings to ground.

Float Charge –

A method of maintaining a cell or battery in a charged condition by continuous, long-term, constant voltage charging at a level sufficient to balance self-discharge.

Float Charge (Battery) MTI –

A continuous low rate charge that compensates for the self-discharge rate of a battery. Also known as Trickle Charge.

Flooded Cell –

A cell design that incorporates an excess amount of electrolyte.

Flower Pot –

Slang for "Universal Bushing Well".

Fluorescent Lamp –

A low pressure Mercury, electric discharge lamp in which a fluorescing coating (Phosphor) transforms some of the ultraviolet energy generated by the discharge into light.

FOB –

Free on Board. A term used in shipping: The point at which liability transfers from seller to buyer.

Foot-candle (fc) –

Standard unit of measure for illumination on a surface. The Average foot-candle level on a square surface is equal to the lumens striking the surface, divided by the area of the surface.

Form A Interface –

Form A generally implies a 2-wire pulse interface, using the K and Y terminals.

Form C Interface –

Form C generally implies a 3-wire pulse interface, using the K, Y and Z terminals.

Form "A" Contacts –

An industry standard contact arrangement that is normally-open or the non-made up position, usually referred to as K and Y.

Form "C" Contacts –

An industry standard single-pole, double-throw (SPDT) contact arrangement that describes a set of relay contacts consisting of one Form A and one Form B with a single "common" (K) contact. A Form C set of contacts will break one set of contacts before making up the the second set. Generally referred to as K, Y and Z.

FPI -

Fault Passage Indicator

Frequency –

In ac systems, the rate at which the current changes direction, expressed in hertz (cycles per second); a measure of the number of complete cycles of a wave-form per unit of time.

Frequency Transducer –

A transducer used for the measurement of the frequency of an A.C. electrical quantity.

FRP –

Fiberglass Reinforced Plastic.

Fulgurate –

A glass-like structure that forms around the element of a current limiting fuse when it operates. It is caused when the heat of the arc melts the silica sand surrounding it.

Full Duplex Communications –

A communications system in which data can travel simultaneously in both directions.

Full Scale –

The specified maximum magnitude of the input quantity being measured that can be applied to a transducer without causing a change in performance beyond specified tolerance.

Full Scale Output –

The specified maximum output value for which the stated accuracy condition applies.

Functional Block Diagram –

One of the IEC 61131-3 programming languages.

Fuse –

A device installed in the conductive path with a predetermined melting point coordinated to load current. Fuses are used to protect equipment from over current conditions and damage.

Fuse Arcing Time –

The amount of time required to extinguish the arc and clear the circuit.

Fuse Link –

1. A replaceable fuse element used in a Fused Cutout. 2. A replaceable part or assembly comprised entirely or principally of the conducting element, requires to be replaced after each circuit interruption to restore the fuse to operating conditions.

Fuse Melt Time –

The time needed for a fuse element to melt, thereby initiating operation of the fuse. Also known as Melt Time.

Fused Cutout –

A device, normally installed overhead, that is used to fuse a line or electrical apparatus.

G

Gassing (Battery) –

The evolution of gas from one or more of the electrodes in a cell. Gassing commonly results from local action (self-discharge) or from the electrolysis of water in the electrolyte during charging.

Gateway –

The Gateway is a computer which provides interfaces between the local computer system and one or several SCADA (or RCC) systems.

Gel –

A chemical compound used to seal and mechanically cushion fiber optic filament in a cable. The cleaners used to remove are made by American Polywater.

Gel Cleaner –

A chemical based cleaner used to remove the gel in a fiber optic cable. Gel cleaner is made by American Polywater Corp.

Generator Step-Up (GSU) –

Generator step up is done by transformers directly connected to the generator output terminals. This is usually done via busbars in large generating stations. They normally have a high voltage in secondary and high current in primary.

GF –

Ground Fault

Gin –

A device used for temporary lifting.

GIS –

Gas Insulated Switchgear (usually SF6).

Glare –

A sensation of uncomfortable brightness, usually coming from a luminaire at angles between horizontal and 45 degrees below horizontal.

Global Positioning System –

A system used for locating objects on Earth precisely, using a system of satellites in geostationary orbit in space. Often used by digital relays to obtain accurate time information.

GMT -

Greenwich Mean Time

Gnd -

Ground

Grease –

1) Slang for Cable Pulling Lubricant, a chemical compound used to reduce pulling tension by lubricating a cable when pulled into a duct or conduit. 2) Slang for Dielectric Grease, a silicone based chemical compound used to seal and lubricate connections.

Grip All Stick –

See Shotgun Stick.

Ground –

1. An electrical term meaning to connect to the earth. 2. A conducting connection, whether intentional or accidental by which an electric circuit, or equipment, is connected to the earth or some conducting body that serves in place of the earth.

Ground Fault –

An undesired current path between ground and an electrical potential.

Ground Grid –

A substation ground grid is made up of buried copper conductors in a grid pattern. The size of the conductors and the spacing between them will vary according to the earth's resistivity. The requirement of the ground grid is that it be appropriate for the magnitude of the available fault current, the operating time of protective devices, and have sufficient mechanical ruggedness. The minimum conductor size for the ground grid is #1/0 copper.

Grunt -

A lineman's helper.

GTO –

Gate Turn-off Thyristor.

Gut –

Slang for "Line Hose".

Guy Strain Insulator –

An insulator, normally porcelain or an epoxilator, used to electrically isolate one part of a down guy from another. Guy Strain Insulators are made by Porcelain Products.

H

H –

Henry.

H-20 –

Also referred to as "HS20-44" or "H20-44" Bridge Loading. H20 Loading refers to a maximum front wheel loading of 8000 lbs. and a maximum rear wheel load of 16,000 lbs. with an impact factor of 30% added (16000 x 1.30) for a total maximum wheel loading of 20,800 lbs.

H2 –

Hydrogen.

H20-44 –

See "H20"

Half-duplex communications –

A communications system in which data can travel in both directions, but only in one direction at a time.

Hard Drawn –

Wire that has been drawn to its specific size and not annealed.

Hard Line –

A Steel Pulling line. Also see Bull Line.

Harmonic –

A sinusoidal component of the voltage that is a multiple of the fundamental wave frequency. Harmonics are primarily the result of the today's modern electronic equipment. Today's electronics are designed to draw current in "pulses" rather than in a smooth sinusoidal wave form.

Harmonic Distortion –

The presence of harmonics that change an AC waveform from sinusoidal to complex.

Harmonic Filters –

Capacitors that are in series and used to control the frequency of electrical equipment. Abnormal frequencies are multiples of the basic 60 hertz.

Hazard Risk Category –

Categories defined by NFPA 70E-2004 to explain protection levels needed when performing tasks. The values range from 1 to 4. ATPV rated PPE is required for categories 1 through 4 as follows: 1- 4 cal/cm^2; 2- 8 cal/cm^2; 3- 25 cal/cm^2; 4- 40 cal/cm^2.

Heart Fibrillation –

The medical condition whereby the heart’s normal electrical rhythm is disrupted. The condition is considered life threatening.

Heat Run Test –

A test that is used to determine the increase in operating temperature at a given load.

Helical –

Wrapped in a spiral fashion. Refers to the way the strands of a conductor are laid.

Henry –

The meter-kilogram-second unit of inductance, equal to the inductance of a circuit in which an electromotive force of one volt is produced by a current in the circuit which varies at the rate of one ampere per second.

Hertz –

1) A unit of frequency equal to one cycle per second. 2) In alternating current, the changing of the negative and positive poles.

HID –

High Intensity Discharge

High Intensity Discharge (HID) Lamp –

An electric discharge lamp in which the light producing arc is stabilized by wall temperature and the arc tube has a bulb wall loading in excess of 3 watts per square centimeter. Examples of HID lamps include High Pressure Sodium, Metal Halide and Mercury Vapor.

High Pot –

A test done to confirm the reliability of an insulation system where a high voltage is applied.

High Pressure Sodium (HPS) Lamp –

A High Intensity Discharge light source in which the arc tube's primary internal element is Sodium Vapor. HPS is commonly used for roadway and area lighting.

High Voltage –

An electrical system or cable designed to operate between 46kV and 230kV.

High Voltage System –

An electric power system having a maximum root-mean-square ac voltage above 72.5 kilovolts (kV).

High-speed reclosing –

A re-closing scheme where re-closure is carried out without any time delay other than required for deionization.

Hooks –

See "Climbers".

Hookstick –

A hot stick that is used to operating switches and cutouts.

Horsepower –

A unit of work. When used to show power usage, one horsepower is equivalent to 746 watts.

Hose –

Slang for "Line Hose".

Hot –

Refers to an energized conductor or apparatus.

Hot Arm –

A device that is used to temporarily extend a conductor beyond the cross arm it was on.

Hotstick –

An insulated stick usually made of fiberglass, which is used to work energized overhead conductors and operate electrical equipment that is overhead, underground and pad mounted.

HPS –

High Pressure Sodium

HRC –

High Rupturing Capacity (applicable to fuses).

HS20-44 –

See "H-20"

HS285 (TM) –

Aluminum Conductor, Steel Supported with Extra High Strength Steel Core. HS285 is a Trademark of Southwire Company.

HSR –

High Speed Re-closing.

HV –

High Voltage.

Hybrid Photovoltaic System –

A photovoltaic system that includes other sources of electric generation such as wind or fossil fuel.

Hydrometer –

A float type instrument used to determine the state-of-charge of a battery by measuring the specific gravity of the battery electrolyte (i.e., the amount of sulfuric acid in the electrolyte).

I

I –

Current

I.D.M.T. –

Inverse Definite Minimum Time.

I/O -

Input/Output

I2t –

Current Squared times time. This is an electrical quantity that is used to determine energy to a protective device, such as a circuit breaker or fuse.

ICCP –

Term used for IEC 60870-6-603 protocol.

ICEA –

Insulated Cable Engineers Association. ICEA is located at P.O. Box P, South Yarmouth, MA 02664.

ICT –

Interposing Current Transformer (software implemented).

IEC –

International Electro technical Commission. [www.iec.ch]

IED - Intelligent Electronic Device –

Equipment containing a microprocessor and software used to implement one or more functions in relation to an item of electrical equipment. IED is a generic term used to describe any microprocessor-based equipment, apart from

IEEE - Institute of Electrical and Electronics Engineers –

Pronounced "eye-triple-E", this non-profit U.S. engineering organization develops, promotes, and reviews standards within the electronics, computer and electric power industries. [www.ieee.org]

IESNA - Illuminating Engineering Society of North America –

Founded in 1906, IESNA is the recognized technical authority on illumination.

IGBT –

Insulated Gate Bipolar Transistor

ILL (Lighting) –

Initial Lamp Lumens

Impedance –

1) The total opposing force to the flow of current in an ac circuit. 2) The total resistance to flow of an alternating current generally expressed in ohms. It is a combination of resistance and reactance.

Impulse –

A current surge

Impulse Test –

Tests to confirm that the insulation level is sufficient to withstand overvoltage's, such as those caused by lightning strikes and switching.

Incandescent Lamp –

A lamp in which light is produced by a filament heated to incandescence by an electric current.

Incident Energy –

The amount of energy impressed on a surface, a certain distance from the source, generated during an electrical arc event. Often measured in calories per centimeter squared (cal/cm²).

Incidental Light Traffic –

Refers to a grade level Reinforced Polymer Concrete or Fiberglass Reinforced Plastic box or Cover load rating of 10,400lbs. This rating is derived from incidental single vehicle tire contact estimated at a maximum of 8000lbs with an impact factor of 30%.

Independent System Operator –

See California Independent System Operator (Cal-ISO).

Independent Time Measuring Relay –

A measuring relay, the specified time for which can be considered as being independent, within specific limits, of the value of the characteristic quantity.

Induced Current –

Current in a conductor resulting from the application of a time varying electromagnetic field.

Induced Voltage –

A voltage produced around a closed path or circuit by a change of magnetic flux linking that path.

Inductance –

1) The property of a circuit in which a change in current induces an electro motive force. 2) Magnetic component of impedance.

Inductor (Reactor) –

A device that causes the current to lag behind the voltage.

Influence Quantity –

A quantity which is not the subject of the measurement but which influences the value of the output signals for a constant value of the measurand.

Initial Lamp Lumens (Lighting) –

(AMF x PS x RW)/(CU x LLF)

Input Quantity –

The quantity, or one of the quantities, which constitute the signals received by the transducer form the measured system.

Inrush Current –

The initial surge of current experienced before the load resistance of impedance increases to its normal operating value.

Instantaneous Relay –

A relay that operates and resets with no intentional time delay.

Instrument Transformer –

A transformer that is only designed to reduce current or voltage from a primary value that is too pass directly through a meter or instrument, to a proportional low level that can safely be applied.

Insulated Gate Bipolar Transistor –

A special design of transistor that is suitable for handling high voltages and currents. Often used in static power control equipment such as inverters, or controlled rectifiers, due to the flexibility of control of the output.

Insulation –

Sunlight, direct of diffuse, from incident solar radiation. It is equal to approximately 1000 watts per square meter at high noon. Not to be confused with insulation.

Insulation –

1) A non-conductive material used on a conductor to separate conducting materials in a circuit. 2) The non-conductive material used in the manufacture of insulated cables. Southwire Company manufacturers insulated cables. Speed Systems manufacturer's tools to strip insulation from cable.

Insulator –

A device that is used to electrically isolate a conductor or electrical device from ground or a different electrical potential. Electrical insulators are manufactured by Porcelain Products Company and W.H. Salisbury & Company.

Intensity (Lighting) –

The brightness of light in a given direction. Luminous intensity may be expressed in Candelas (cd) or in Lumens.

Intermediate (Lighting) –

Those areas of a municipality often characterized by moderately heavy nighttime pedestrian activity such as in blocks having libraries, community recreation centers, large apartment buildings, industrial buildings or neighborhood retail stores.

Intermediate Class Arrester –

Surge arresters with a high energy handling capability. These are generally voltage classed at 3-120kV.

Internal Impedance (Battery) –

The opposition to the flow of alternating current at a particular frequency in a cell or battery at a specific state-of-charge and temperature.

Internal Resistance (Battery) –

The opposition or resistance to the flow of Direct Electric Current within a cell or battery; the sum of the ionic and electronic resistance of the cell components. Its value vary with the current, state-of-charge, temperature, and age. With an extremely heavy load, such as an engine starter, the cell voltage may drop to approximately 1.6. This voltage drop is due to the internal resistance of the cell. A cell that is partly discharged has a higher resistance than a fully charged cell; hence it will have a greater voltage drop under the same load. This internal resistance is due to the accumulation of lead sulfate on the plates. The lead sulfate reduces the amount of active material exposed to the electrolyte; hence it deters the chemical action and interferes with the current flow.

International System of Units (SI) –

A universal system of units in which the following six units of measure are considered basic: meter, kilogram, second, ampere, Kelvin degree and candela.

Interrupter Switch –

A switch equipped with an interrupter for making or breaking connections under load.

Interrupting Medium –

The "fluid" used to interrupt the flow of electric current in a switch or circuit breaker. In high power equipment, this may be oil, insulating gas or even no material, as is the case of vacuum interruption which works because in a vacuum there is no mate.

Interrupting Rating –

The rating of a device to interrupt the flow of power or current, generally applied to a circuit breaker or a switch.

Interruption –

The loss of electric service to one or more customers or other facilities. It is the result of one or more component outages.

Interruption Duration –

The period from the initiation of an interruption to a customer or other facility to the time the service is restored.

Interruption, Momentary –

An interruption of a duration limited to the period required to restore service by automatic or supervisory controlled switching operations or by manual switching at locations where operators are immediately available. Such switching operations must be completed within five (5) minutes, including all reclosing operations.

Interruption, Sustained –

Any interruption not classified as momentary. Any interruption longer that five (5) minutes.

Interstices –

The space between two or more objects, such as the individual strands in a stranded conductor or conductors in a cable.

Intranet –

A restricted access network that works like the internet but is not. Usually owned and managed by a corporation, an Intranet enables a company to share its resources with its employees without confidential information being made available to everyone with internet access.

Intrinsic Error –

An error determined when the transducer is under reference conditions.

Inverse Time Delay Relay –

A dependent time delay relay having an operating time which is an inverse function of the electrical characteristic quantity.

Inverter –

A device that converts DC electricity into single or multiphase AC electricity.

Investor Owned Utility (IOU) –

A utility company whose assets are owned by investors and whose stock is publicly traded.

Ion –

Part of a molecule or group of atoms, positively or negatively charged, that transports electricity.

IOU –

See Investor Owned Utility

IP Address –

Internet Protocol address. This address is a 32 bit, unique string of numbers that identifies a computer, a printer, or another device on the internet. The IP address consists of a quartet of numbers separated by periods.

IRIG-B –

An international standard for time synchronization.

Iron Core Reactor –

A reactor that resembles a transformer and is oil cooled.

ISM Band –

The 2.4 GHz frequency spectrum. ISM is actually synonymous with 2.4 GHz; however, it stands for Industrial, Scientific and Medical.

ISO –

Independent System Operator

Isolation –

To be electrically separate. A measure of the strength of the dielectric providing the electrical division or separation.

Isolation Link –

A metal link used in series with a fusing device that melts and prevents refusing/re-energization of a transformer.

Isotropic Antenna –

A theoretical, ideal antenna having a signal range of 360 degrees. It is used as a baseline for measuring a real antenna's strength signal, in dBi, where i represents Isotropic Antenna.

J

Jacket –

A covering over insulated conductors for the purpose of electrical, chemical, and physical protection.

Jamming –

When the combined diameters of three cables roughly equal the interior diameter of the conduit, the cables can line up linearly as they are pulled around the bend. The cables then wedge against the conduit wall as they are forced towards the inside of the bend. The wedged (or jammed) cables are "stuck." To pull jammed cables with enough force to get them through a bend usually ruins the cable by ripping off the jacket or crushing the insulation.

JIT –

Just in Time

Johnny Ball –

Slang for "Guy Strain Insulator".

Joule –

1) Work done by the force of one neutron when its point of application moves through the distance of one meter in the direction of the force. 2) One watt-second.

Jumper –

An electrical connection between two points.

Junction, 200 Amp –

A "200 Amp Junction" is a molded synthetic and composite device used to connect two or more 200 Amp rated cables operating at Medium Voltage (4-35KV nominal). Connections to the cables are made via "200 Amp Elbows".

Junction, 600 Amp –

A "600 Amp Junction" is a molded synthetic and composite device used to connect two or more 600 or 900 Amp rated cables operating at Medium Voltage (4-35KV nominal). Connections to the cables are made via "T-Bodies".

K

K-Bus (Courier) –

Term used for the courier protocol on K-Bus interface for K-Relay range manufactured by Alstom.

“K” Lead –

The center or common lead of a 3-wire (Form C) or single-pole double-throw switch.

Kcmil –

One thousand circular-mils (see Circular-Mil)

Kilo –

A prefix indicating one (1) thousand.

Kilowatt –

1000 watts of real power. Expressed at kW.

Kilowatt Hour –

The use of one thousand watts for one hour.

Knee-Point e.m.f. –

Result of when a sinusoidal e.m.f. is applied to the secondary terminals of a current transformer is increased by 10% causes the exciting current to increase by 50%.

kVA –

1) Apparent Power expressed in Thousand Volt-Amps. 2) Kilovolt Ampere rating designates the output which a transformer can deliver at rated voltage and frequency without exceeding a specified temperature rise.

KVAR –

KVAR is the measure of additional reactive current flow which occurs when the voltage and current flow are not perfectly synchronized or not in phase.

kW –

See "Kilowatt".

kWh –

See "Kilowatt Hour"

KYZ –

A designator for the Form-C pulse initiator output from a transducer.

KYZ Output –

A three-wire pulse output from a metering device to drive external control or recording equipment. Each pulse or transition represents a predetermined increment of energy or other quantity. Average power can be determined with a known pulse count over a specified period and a given energy pulse value.

L

L –

A symbol used to express inductance. The unit of measure is a "Henry".

LA –

The traditional symbol used in the electrical industry to mean lightning arrester.

Ladder Diagram (LD) –

One of the IEC 61131-3 programming languages.

Lag –

The condition where the current is delayed in time with respect to the voltage in an ac circuit (for example, an inductive load).

Lamp –

A complete light source unit, usually consisting of a light generating element (arc tube or filament), support hardware, enclosing envelope and base.

Lamp Lumen Depreciation, LLD (Lighting) –

Information about the chosen lamp and its lumen depreciation and mortality are available from lamp manufacturers' literature. Rated average life should be determined for the specific hours per start; it should be known when burnouts occur in the lamp life cycle. From these facts, a practical, group re-lamping cycle should be established. Based on the hours elapsed to lamp replacement, the LLD factor can be determined.

LAN –

Local Area Network which is a short-distance network used to link a group of computers or intelligent devices together, usually within a building.

Latching Relay –

A relay (usually mercury-wetted for this application) that will stay in the last position it was in when voltage was removed. Requires both a set and reset signal to open and close it. Called "Bi-Stable" since they can be stable in either state in absence of power. No longer found in solid state products.

Lateral Circuit –

A tap-off line to take primary distribution from the main power line to a nearby load center.

Lateral Light Distribution –

Lateral light distributions are classified by IES distribution Types I, II, III, IV and V. In general, the larger the number, the more is projected across the roadway. This allows the lighting designer to select the appropriate distribution pattern for a given roadway width.

Lay Direction –

1) The direction in which the wires of a conductor are twisted.

2) The twist of conductors in a cable.

Lay Length –

The distance required to complete one revolution of helically laid strands of wires.

LCD –

Liquid Crystal Display

LDC –

A Line Drop Compensator is utilized to provide constant voltage at the load. This is normally associated with voltage regulators and their control settings.

LDD –

Luminaire Dirt Depreciation Factor

Lead –

The condition where the current precedes in time with respect to the voltage in an ac circuit (for example, a capacitive load).

Lead Acid (Battery) –

Term used in conjunction with a cell or battery that utilizes lead and lead peroxide as the active plate materials in a diluted electrolyte solution of sulfuric acid and water. The nominal cell voltage is 2.1 volts.

Lead Acid Battery –

The assembly of one or more cells with an electrolyte based on dilutes sulfuric acid and water, a positive electrode of lead dioxide and negative electrodes of lead. Lead Acid batteries all use the same basic chemistry. The positive plate is comprised of lead dioxide and the negative of finely divided lead. Both of these active materials react with the sulfuric acid electrolyte to form lead sulfate on discharge. The reaction is reversed on recharge. Batteries are constructed with lead grids to support the active material and individual cells are connected to produce a battery in a plastic or glass case.

Lead Dioxide (Battery) –

The higher oxide of lead present in charged positive plates. It is frequently referred to as lead peroxide.

Lead Peroxide –

See Lead Dioxide.

Lead Sulfate –

A lead salt formed by the action of sulfuric acid on lead oxide during paste mixing and formation. It is also formed electromechanically when a battery is discharged.

LED –

Light Emitting Diode

Light –

Energy that is capable of exciting the retina and producing a visual sensation.

Light Loss Factor (LLF) –

A factor used in calculating luminance after a given period of time and under given conditions. It takes into account temperature and voltage variations, dirt accumulation on luminaire and lit surfaces, lamp depreciation, maintenance procedures and atmos

Light Traffic –

A grade level Box or Cover rating. See "Incidental Light Traffic".

Lighting Arrester –

A device that protects power lines and equipment against high voltage lighting surges and switching surges. Connected from line to ground potential, the device has a very high resistance to current flow at normal voltages but when a very high voltage surge hits it, it becomes a very low resistance, passing damaging surges and current to ground.

Lighting Maintenance Factor (MF) –

The result of time-dependent depreciation effects must be considered in the initial design. Regular maintenance is particularly important with regard to energy conservation and these plans, once incorporated into the design, should be carried out or the system will not perform as expected.

Lightning –

Lightning is a powerful natural electrostatic discharge produced during a thunderstorm. Lightning's abrupt electric discharge is accompanied by the emission of light.

Lightning & Switching Impulses –

A distinction is made between Lightning and Switching impulses on the basis of duration of the wave front. Impulses with wave-front durations of up to a few tens of microseconds are in general considered to be lightning impulses. Those having durations of tens to thousands of microseconds are considered to be switching surges.

Limit Switch –

A protective device used to open or close electrical circuits when certain limits, such as temperature or pressure, are reached.

Limited Approach Boundary –

An approach limit at a distance from an exposed live part within which a shock hazard exists.

Limiting Value of the output current –

The upper limit of the output current which cannot, by design be exceeded under any conditions.

Line –

Refers to the conductor in an overhead or underground distribution or transmission line.

Line Hose –

A rubber dielectric covers for conductor that is used to electrically isolate a worker from an energized conductor. Line hose is made by W.H. Salisbury & Company.

Line Traps –

High voltage lines can be used to transmit R. F. carrier signals for the purposes of voice communication, remote signaling and control. The frequency range from 30 to 500 kHz has proven to be advantageous for high frequency carrier transmission. Line traps are used to minimize the losses of the R. F. carrier signals. They are therefore series connected with the high voltage lines on the substation side and must be designed to withstand the maximum continuous and short-time currents that will occur. Certain characteristic values such as impedance, the resistive component of impedance and attenuation must remain above given minimum values within the band-width of the line trap.

Liner –

Cloth gloves used to line the inside of a rubber insulating glove.

LLF (Lighting) –

Light Loss Factor

Load –

1) The amount of electrical power required by connected electrical equipment. 2) The total impedance of all the items in the output circuit.

Load break –

Refers to a group of rubber insulating products used to electrically connect apparatus with which load can be separated manually. Loadbreak products are manufactured by T&B Elastimold.

Load Loss –

See "Coil Loss".

Local Control Mode –

When set for a given control point it means that the commands can be issued from this point.

Local Roadway (Lighting) –

Roadways used primarily for direct access to residential, commercial, industrial or other abutting properties. They do not include roadways carrying through traffic. Long local roadways will generally be divided into short sections by collector roadway systems.

Long Distribution (Lighting) –

A luminary is classified as having a long light distribution when its max candlepower point falls between 3.75MH - 6.0MH TRL. The maximum luminaire spacing-to-mounting height ratio is generally 12.0 or less.

Long-Term Stability –

The stability over a period of one year.

LPW –

Lumens Per Watt

Lube –

Slang for "Cable Pulling Lubricant".

Lumen –

Standard unit of measure for light flux or light energy. Lamp light output is measured in Lumens.

Lumens Per Watt (LPW) –

The ratio of light energy output (Lumens) to electrical energy input (Watts).

Luminaire –

A complete lighting unit consisting of a light source with a means of distribution (reflector and/or refractor), lamp positioning (socket), lamp protection (housing) and a provision for power connection.

Luminaire Dirt Depreciation (LDD) –

The accumulation of dirt on luminaires results in a loss of light output on the road. This loss is known as the LDD factor and is determined by estimating the dirt category from the graph below. From the appropriate dirt condition curve and the proper elapsed time of the planned cleaning cycle, the LDD factor is then found.

Luminaire Dirt Depreciation Factor (LDD) –

The multiplier used in illuminance calculations to relate the initial illuminance provided by clean, new luminaires to the reduced illuminance that they will provide due to dirt collection on the luminaires at the time at which it is anticipated that cleaning procedures will be instituted.

Luminance –

The density of the luminous flux incident on a surface. It is the quotient of the luminous flux multiplied by the area of the surface when the latter is uniformly illuminated.

Luminance –

In a direction and at a point of a real or imaginary surface - The quotient of the luminous flux at an element of the surface surrounding the point, and propagated in directions defined by an elementary cone containing the given direction, multiplied by the solid angle of the cone and the area of the orthogonal projection of the element of the surface on a place perpendicular to the given direction.

Lux –

The SI unit of luminance. One lux is one lumen per square meter.

LV –

Low Voltage

M

MAC address –

Media Access Control address is a unique numeric identifier assigned to each device connected to an Ethernet network. It is used for data transmission and security functions.

Main Protection –

The protection system which is normally expected to operate in response to a fault in the protected zone.

Major Roadway (Lighting) –

That part of the roadway system that serves the principal network for through-traffic flow. The routes connect areas of principal traffic generation and important rural highways entering the city.

Maximum Permissible Values of the input current and voltage –

Values of current and voltage assigned by the manufacturer which the transducer will withstand indefinitely without damage.

Mbps –

Megabits per second. A megabit is roughly a million bits of data. This abbreviation is used to describe data transmission speeds, such as the rate at which information travels over the internet.

MCC –

Motor Control Center

MCCB –

Molded Case Circuit Breaker

Mean-Sensing Transducer –

A transducer which measures the mean or average value of the input waveform but which is adjusted to give an output corresponding to the r.m.s. value of the input when that input is sinusoidal.

Measured –

A quantity subjected to measurement.

Measuring Element –

A unit or module of a transducer which converts the measurand, or part of the measurand into a corresponding signal.

Measuring Range –

The part of the span where the performance complies with the accuracy requirements.

Measuring Relay –

An electrical relay intended to switch when its characteristics quantity, under specified conditions and with a specified accuracy attains its operating value.

Medium Distribution (Lighting) –

A luminary is classified as having a medium light distribution when its max candlepower point falls between 2.25MH - 3.75MH TRL. The maximum luminaire spacing-to-mounting height ratio is generally 7.5 or less.

Medium Voltage –

An electrical system or cable designed to operate between 1kv and 38kv.

Megohmmeter –

A testing device that applies a DC voltage and measures the resistance (in millions of ohms) offered by conductor's or equipment insulation. Also used to measure the earth's resistivity. It is typically used to check insulators, lightning arresters, and substation transformer bushings.

Melt Time –

The time needed for a fuse element to melt, thereby initiating operation of the fuse. Also known as Fuse Melt Time.

Mercury Vapor Lamp (MV) –

An HID light source in which the arc tube's primary internal element is Mercury Vapor.

Mercury Wetted Contacts –

Contacts that have a very small amount of mercury around the contact point to prevent arcing or "bounce" when the contacts close. Most mercury-wetted relays (switches) must be mounted in the vertical position. No longer found in solid state products.

Messenger –

A bare wire used to support power or communications cables suspended overhead.

Metal Clad (Switchgear) –

An expression used by some manufactures to describe a category of medium voltage switchgear equipment where the circuit breakers are all enclosed in grounded, sheet-steel enclosures. Such enclosures may be suitable for indoor use or may be enclosed in an integral weatherproof housing for installation out of doors.

Metal Enclosed (Switchgear) –

An expression used by some manufacturers to describe a category of low voltage, 600 volt class switchgear equipment, where the circuit breakers are all enclosed in grounded, sheet-steel enclosures. Such enclosures normally are suitable only for indoor use

Metal Halide Lamp (MH) –

A HID light source in which the arc tube's primary internal element is Mercury Vapor in combination with Halides (salts or iodides) of other metals such as Sodium or Scandium.

Metering (non-tariff) –

Values computed depending on the values of digital or analog inputs during variable periods.

Metering (tariff) –

Energy values computed from digital and/or analog inputs during variable periods and dedicated to energy measurement for billing purposes.

MHR (Lighting) –

Mounting Height Ratio

Micro –

One-millionth

Mid-Point Sectioning Substation –

A substation located at the electrical interface of two sections of electrified railway. It contains provision for the coupling of the sections electrically in the event of loss of supply to one section.

Mil –

One-thousandth of an inch (0.001 inch)

Millisecond –

One one-thousandth of a second.

Mobile Transformer –

A transformer that often is mounted on a leak proof base and can be installed and operated in a semi-trailer, box truck or sea freight container.

ModBus –

Proprietary communication protocol used on secondary networks between HMI, substation computers or Bay computers and protective relays.

Modem –

Device utilized to convert computer data into sound that can be transmitted over phone lines. First used to send telegrams the modem received the name from the process of modulation and demodulation at the receiving end.

Module (Photovoltaic) –

See "Photovoltaic Module".

Momentary Rating –

The rating of a device to withstand momentary, very high current, without incurring damage.

Mortality Curve –

A graphic representation of lamp burnout as a function of time.

Motion Resistant Conductor –

ACSR with Motion Resistant Variable Profile.

MOV –

Metal Oxide Value (Varistor) is a cake of metal oxide developed in the 1970's for use as the arc quenching medium in lightning arresters.

MRO –

Maintenance and Repair

MTW –

Machine tool wire, used for electrical connections inside equipment.

Multi-Crystalline (Photovoltaic) –

A material that is solidified at such a rate that many small crystals (crystallites) form. The atoms within a single crystallite are symmetrically arranged, whereas the crystallites are jumbled together.

Multi-element transducer –

A transducer having two or more measuring elements. The signals from the individual elements are combined to produce an output signal corresponding to the measurand.

Multi-section transducer –

A transducer having two or more independent measuring circuits for one or more functions.

Multi-shot reclosing –

A re-closing scheme that permits more than one re-closing operation of a CB after a fault occurs before lock-out occurs.

MV –

See "Medium Voltage".

MVA –

Apparent Power expressed in Million Volt-Amps.

MW –

Mega Watt, one million watts.

MWH –

Mega Watt Hour, the use of one million watts for one hour.

N

N/C –

Normally Closed

N/O –

Normally Open

NAICS –

North American Industry Classification System. This is used in place of the PPI (Producer Price Index) system.

Nameplate Rating –

The normal maximum operating rating applied to a piece of electrical equipment. This can include Volts, Amps, horsepower, kW, or any other specific item specification for the equipment.

NEC –

National Electrical Code (NFPA-70).

NEMA –

National Electrical Manufacturers Association. NEMA provides a forum for the standardization of electrical equipment and is located at 2101 L Street N.W., Washington, DC, 20037. [http://www.nema.org/]

Neutral Conductor –

In multiphase circuits, the conductor used to carry unbalanced current. In single-phase systems, the conductor used for a return current path.

Neutral Ground Reactor –

A reactor used to connect the neutral point of a three phase system to ground. Neutral Ground Reactors are used to limit ground fault current on Neutral Grounded (WYE) systems.

Neutral Grounding Resistor –

A device that connects the neutral point of a three phase system to ground. Neutral Grounding Resistors are used to limit ground fault current on Neutral Grounded (WYE) systems.

NFPA –

The National Fire Protection Association.

NFPA 70E Standard –

Standard that provides guidance on implementing appropriate work practices that are required to safeguard workers from injury while working on or near exposed electrical conductors or circuit parts that could become energized.

NIC –

Network Interface Card is a device utilized by a computer to connect to a wired or wireless network.

Nickel Cadmium Battery –

The assembly of one or more cells with an alkaline electrolyte, a positive electrode of nickel oxide and negative electrodes of cadmium.

No Load Loss –

See "Core Loss".

Nominal –

The normal operating value.

Nominal Capacity (Battery) –

A designation by the battery manufacturer which helps identify a particular cell model and also provides an approximation of capacity. It is normally expressed in ampere-hours at a given discharge current.

Nominal Voltage –

A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class. The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

Nominal Voltage (Battery) –

Voltage of a fully charged cell or battery when delivering rated capacity at a specific discharge rate. The nominal voltage per cell is 2V for Lead Acid, 1.2V for Nickel-Cadmium, 1.2V for Nickel Metal Hydride and 3.9V for Lithium Ion (small cells only).

Non-cutoff (Lighting) –

Luminaire light distribution is classified as non-cutoff when there is no candlepower limitation in the zone above max candlepower.

Non-Halogen Ethylene Copolymers –

Non-Halogen Ethylene Copolymers combine attributes of polyethylene and polypropylene to produce cable insulating and jacketing compounds with superior fire protection. Unlike other ethylene compounds, these do not contain chemicals from the Halogen group

Non-Load break –

Refers to a group of rubber insulating products that cannot be separated under load. Also see Loadbreak.

North American Electric Reliability Corporation (NERC) –

The **North American Electric Reliability Corporation** (**NERC**) is a nonprofit corporation based in Atlanta, Georgia, and formed on March 28, 2006, as the successor to the North American Electric Reliability Council (also known as NERC). The original NERC was formed on June 1, 1968, by the electric utility industry to promote the reliability and adequacy of bulk power transmission in the electric utility systems of North America. NERC's mission states that it is to "ensure the reliability of the North American bulk power system." NERC oversees eight regional reliability entities and encompasses all of the interconnected power systems of the contiguous United States, Canada and a portion of Baja California in Mexico.

NERC's major responsibilities include working with all stakeholders to develop standards for power system operation, monitoring and enforcing compliance with those standards, assessing resource adequacy, and providing educational and training resources as part of an accreditation program to ensure power system operators remain qualified and proficient. NERC also investigates and analyzes the causes of significant power system disturbances in order to help prevent future events.

As part of the fallout of the Northeast Blackout of 2003, the Energy Policy Act of 2005 authorized the Federal Energy Regulatory Commission (FERC) to designate a national Electric Reliability Organization (ERO). On July 20, 2006, FERC issued an order certifying NERC as the ERO for the United States. Prior to being the National ERO, NERC's guidelines for power system operation and accreditation were referred to as *Policies*, for which compliance was strongly encouraged yet ultimately voluntary. NERC has worked with all stakeholders over the past several years to revise its Policies into *Standards*, and now has authority to enforce those standards on power system entities operating in the United States, as well as several provinces in Canada, by way of significant financial penalties for noncompliance. Efforts between NERC and the Canadian and Mexican governments are underway to obtain comparable authority for NERC to enforce its standards on the NERC member systems residing outside of the United States.

Notching Relay –

A relay which switches in response to a specific number of applied impulses.

NPS –

Negative Phase Sequence

Nylon –

For Wire and Cable applications, Nylon, a thermoplastic compound, is used exclusively as a jacketing material. Nylon Jackets provide the insulation system a high degree of mechanical and chemical protection.

O

OA –

Oil-Air, a cooling classification for transformers now classified as ONAN. Oil type, Natural convection flow through cooling equipment and in windings, & Air external cooling medium.

Occasional Traffic –

Refers to a grade level Reinforced Polymer Concrete or Fiberglass Reinforced Plastic Box or Cover load rating of 20,800lbs. This rating is derived from double wheel loading of 16,000 lbs with an impact factor of 30% added (16000 x x1.30). Application is limited generally for use in Parking Lots, Driveways and other Non-Street areas where vehicle traffic is expected. Meets the base loading of AASHTO H-20 but not listed as such to prevent use in streets.

Off Peak Power –

Power supplied during designated periods of low power system demand.

Off-Load Tap Changer –

A tap changer that is not designed for operation while the transformer is supplying load.

OHL –

Overhead Line

Ohm –

A unit of electrical resistance defined as the resistance of a circuit with a voltage of one volt and a current flow of one ampere.

Ohm's Law –

E=IR; I=E/R; R=E/I; Where E = Voltage impressed on a circuit, I = current flowing in a circuit and R = circuit resistance. Ohm's Law is used for calculating voltage drop, fault current and other characteristics of an electrical circuit.

Oil Breakers –

A type of high voltage circuit breaker using mineral oil as both an insulator and an interrupting medium. Typically, these units were produced for use at voltages from 35 kV to as much as 345 kV. Generally, these are older types and no longer produced for new installations.

OHGW (Overhead Ground Wire) –

A galvanized steel wire that is used to prevent lightning from striking the equipment below it. On transmission lines, it is in the uppermost position and grounded at every structure. In substations, the wire runs 20-40 feet above the substation equipment, is supported by 60-80 foot poles or towers and is connected to the ground grid.

OLTC –

See "On Load Tap Changer"

Omni directional Antenna –

This is like a dipole antenna because it radiates its signal 360 degrees horizontally; however, its signal is flatter than a dipole's allowing for higher gain.

On Load Tap Changer –

A tap changer that can be operated while the transformer is supplying load.

One-Axis Tracking (Photovoltaic) –

A system capable of rotating about one axis for tracking of the sun.

Open Link –

A fuse used on overhead electrical distribution systems that are held in place by two springs. This device and its holder have generally been replaced by Fused Cutouts where the fuse element in an arc tube.

Open-Circuit Voltage (Battery) –

The voltage of a cell or battery when it is not delivering or receiving power.

Open-Type Reactor –

A reactor that has no iron core or housing.

Opening Time –

For a CB the time between energizing of the trip coil and the instant of contact parting. With a relay the operating time is defined as the time which elapses between the application of a characteristic quantity and the instant when the relay operates.

Operating Current –

The current used by a lamp and ballast combination during normal operation.

Operating Current (of a relay) –

The current at which a relay will pick up.

Operating time Characteristic –

The curve depicting the relationship between different values of the characteristic quantity applied to a relay and the corresponding values of operating time.

Operating Value –

The limiting value of the characteristic quantity at which the relay actually operates.

OPGW - Optical Ground Wire –

A ground wire that includes optical fibers to provide a communications link.

Oscillograph –

An instrument for measuring alternating electric current or voltage by capturing the wave form. Electric Utilities use a variant called a Prefault Recorder, where the wave forms are stored for a short time on an ongoing basis and saved if the system sees an abnormal condition. These systems are also used to capture short duration transient conditions such as switching surges and lightning.

OSHA –

Occupational Safety and Health Administration. Government agency which seeks to assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.

OSHA 29 CFR 1910, Subpart S-Electrical –

Occupational Safety and Health Standards. Section 1910 Subpart S-Electrical Standard number 1910.333 specifically addresses Standards for Work Practices.

OSI 7-layer model –

The Open System Interconnection 7-layer model is a model developed by ISO for modeling of a communications network.

Outage –

The state of a component or part of a power system that is not available for service because of some event associated with the component of power system. These are the longer term events (several seconds to hours) caused by external factors such as trees.

Outage, Forced –

1. An outage that results from conditions directly associated with a power system component requiring that it be taken out of service either automatically or after switching operations can be performed. 2. An outage by improper operation of equipment or by human error.

Outage, Scheduled –

An outage that results from intentionally taking a power system out of service, normally for maintenance or replacement.

Output common mode interface voltage –

An unwanted alternating voltage which exists between each of the output terminals and a reference point.

Output Current of a transducer –

The current produced by the transducer which is an analog function of the measurand.

Output Load –

The total effective resistance of the circuits and apparatus connected externally across the output terminals.

Output series mode interface voltage –

An unwanted alternating voltage appearing in series between the output terminals and the load.

Output Span –

The algebraic difference between the lower and upper nominal values of the output signal.

Over current Relay –

A protection relay that's tripping decision is related to the degree by which the measured current exceeds a set value.

Over range –

The specified maximum operating point for which the stated accuracy condition applies.

Overcharge (battery) –

The forcing of current through a cell after all the active material has been converted to the charged state (after 100% charged). The result will be the decomposition of water in the electrolyte into hydrogen and oxygen gas.

Overload –

The specified maximum magnitude of the input quantity that can be applied for a specified period of time without causing damage.

Overshoot Time –

The overshoot time is the difference between the operating time of the relay at a specified value of the input energizing quantity and the maximum duration of the value of input energizing quantity which, when suddenly reduced to a specific value below the operating level, is insufficient to cause operation.

Oxygen Recombination –

The process by which oxygen generated at the positive plate during charge reacts with the pure lead material of the negative plate and in the presence of sulfuric acid and reforms water.

P

Packet –

When data is ready to be transmitted it is divided into pieces called packets. These packets contain information about which computer sent the data and where the data is going.

Pad Mounted Transformer –

A transformer that is mounted on a pad (usually concrete or polycrete) that is used for underground service. Pad mounted transformers are available in single phase and three phase configurations.

Parallel Connection –

In the case of DC circuits, a way of joining two or more electrical devices or wires by connecting positive leads and negative leads together.

Parametric Conjunctive Test –

A conjunctive test that ascertains the range of values of each parameter for which the test meets specific performance requirements.

Parking Bushing –

A bushing that is designed to accept a 200a elbow. Parking bushings are used to "Park" a hot cable that is terminated with a 200 Amp rated elbow.

Parking Stand –

A metal bracket, usually made of steel that is used to support a parking bushing that in turn is used to "Park" a medium voltage cable that is terminated with an 200 Amp rated elbow. Parking Stands are usually furnished mounted to the front panel of 200 Amp rated electrical apparatus such as pad mounted transformers and switchgear, on the covers of submersible transformers and on 200 Amp Junctions.

Parkway –

Sometimes referred to as a rating for Grade Level Boxes or Covers rating. See "Incidental Light Traffic".

Pasted Plate (Battery) –

Paste in which the active material is applied as a paste to a conductive grid.

PC Card –

A credit card-sized peripheral that plugs into personal computers to expand RAM memory, add a modem, network card, hard drives, and other various PC devices. Three types of card have been standardized by the PCMCIA Type I, Type II, and Type III. They have thickness of 3.3 mm, 5 mm, and 10.5 mm respectively.

PCB –

Printed circuit board.

PCC –

Point of Common Coupling.

PCI –

Peripheral Component Interconnect. Self-configuring PC local bus.

PCMCIA –

Personal Computer Memory Card International Association. Trade association founded in 1989 to establish standards for expansion cards for portable computers (See PC Card).

PE – Polyethylene -

PE is a thermoplastic wire and cable insulating material that is also used for cable jacketing.

Peak to Peak –

The amplitude of the ac wave form from its positive peak to its negative peak.

PED –

Power Electronic Device.

Pedestrian Loading –

Refers to a grade level Reinforced Polymer Concrete or Fiberglass Reinforced Plastic Box or Cover loading applied by pedestrian traffic.

Pedestrian Walkway (Lighting) –

A public walk for pedestrian traffic not necessarily within the right-of-way for vehicular traffic. Included are skywalks (pedestrian overpasses), sub-walks (pedestrian tunnels), walkways giving access to parks or block interiors and mid-block street crossings.

PF –

Power Factor

Phase Angle –

The angular displacement between a current and voltage waveform, measured in degrees or radians.

Phase Angle Transducer –

A transducer used for the measurement of the phase angle between two a.c. electrical quantities having the same frequency.

Phase Rotation –

Phase rotation defines the rotation in a Poly-Phase System and is generally stated as "1-2-3", counterclockwise rotation. Utilities in the United States use "A-B-C" to define their respective phase names in place "1-2-3". However some refer to their rotation as A-B-C, A-C-B, or C-B-A counterclockwise, where "A" can replace 1, 2, or 3. Europe adapted R-S-T to define the phase names.

Photovoltaic –

Refers to the conversion of light into electricity.

Photovoltaic Array –

An interconnected system of photovoltaic modules that function as a single electricity producing unit. The modules are assembled in a discrete structure, with common mechanical support or mounting.

Photovoltaic Cell –

The smallest semiconductor element within a photovoltaic module to perform the immediate conversion of light into electrical energy (DC Voltage and DC Current).

Photovoltaic Concentrator –

A Photovoltaic module that uses optical elements to increase the amount of sunlight incident on a Photovoltaic cell. Concentrating arrays must track the sun. Efficiency is increased, but lifespan is decreased because of the high heat.

Photovoltaic Conversion Efficiency –

The ratio of electric energy produced by a photovoltaic device to the energy from sunlight incident upon the cell.

Photovoltaic Efficiency –

The ratio of electric power produced by a cell at any instant to the power of the sunlight striking the photovoltaic cell. This is typically 9% to 14% for commercially available cells.

Photovoltaic Module –

The smallest environmentally protected, essentially planar assembly of solar cells and ancillary parts, such as interconnections, terminals and protective devices such as diodes intended to generate dc power under unconcentrated sunlight.

Photovoltaic Panel –

Often used interchangeably with Photovoltaic Module. Especially in one-module systems, but more accurately used to refer to a physically connected collection of modules (i.e., a laminate string of modules used to achieve a required voltage and current).

Photovoltaic Stand-Alone System –

An autonomous or hybrid photovoltaic system not connected to a grid. The system may or may not have storage but most have required a battery.

Photovoltaic System –

A complete set of components for converting sunlight into electricity by the Photovoltaic process, including the array and balance of system devices.

Pick up ratio –

The ratio of the limiting values of the characteristic quantity at which the relay resets and operates. This value is sometimes called the differential relay.

Pick-up –

A relay is said to 'pick-up' when it changes from the de-energized position to the energized position.

Pilot Channel –

A means of interconnecting between relaying points for the purpose of protection.

Pilot Line –

A cord or rope used to pull a heavier rope that will be used to pull a conductor into place.

Ping –

Ping is a computer program that sends a packet over the internet to another computer to see if the remote computer is still responding. If the ping returns to the sending computer the remote computer is still connected.

Plant Plate (Battery) –

Plate made of pure lead.

Plate (Battery) –

The electrode of a cell consisting of a current collector and a positive or negative active material.

PLC - Programmable Logic Controller –

A specialized computer for implementing control sequences using software.

Plug Setting Multiple –

A term used in conjunction with electromechanical relays, denoting the ratio of the fault current setting of the relay.

Pocket Current Transformer –

A round or toroidal core transformer mounted on bushings of power transformers, bulk oil circuit breaker, and other dead tank circuit breakers. These transformers are placed in pockets of these elements they are mounted on where the pocket length is measured in inches.

POD – Point of Delivery –

Demarcation for electrical delivery from the utility to customer service wire connection. [also known as POC (Point of Connection)]

Point of Common Communication –

The interface between an in-plant network containing embedded generation and the utility distribution network to which the in-plant network is connected.

Polarity –

1) The electrical Term used to denote the voltage relationship to a reference potential (+). 2) With regard to Transformers, Polarity is the indication of the direction of the current flow through the high voltage terminals with respect to the direction through the low voltage terminals.

Pole Spacing (Lighting) –

(ILL x CU x LLF)/(AMF x RW)

Polycrystalline –

See "Multi Crystalline".

Polyethylene –

A thermoplastic material composed of ethylene polymers. Polyethylene has excellent electrical and mechanical properties and is used an insulating material in cable.

Polymer Concrete –

Also referred to as Reinforced Polymer Mortar (RPM). Polymer Concrete material consists of calcareous and siliceous stone, glass fibers and thermoses polyester resin. Polymer concrete can be used in the manufacture of equipment pads, grade level boxes and box covers.

Polyphase –

A polyphase system is a means of distributing alternating current electrical power. Polyphase systems have two or more energized electrical conductors carrying alternating currents with a definite time offset between the peak amplitudes of the wave in each conductor. In modern utility power generation and distribution three phases are used, with the phases separated in time by one third of an AC cycle. A polyphase system must provide a defined direction of phase rotation, so mirror image voltages do not count towards the phase order. A 3-wire system with two phase conductors 180 degrees apart is still only single phase. Such systems are sometimes described as split phase.

Polyvinyl Chloride –

Polyvinyl Chloride. PVC, a thermoplastic compound, is a commonly used Wire and Cable insulation and jacketing material.

Porcelain –

This hard variety of ceramic made of baked clay is highly resistive to the flow of electricity. Porcelain as an electrical insulator has been in use since 1897 when the first National Electrical Code was issued.

Port –

In networking, a server's various functions, such as managing FTP traffic or maintaining the DNS list, are each assigned a virtual address called a port. Any requests for that function are sent to the port address.

Port Forwarding –

This allows a computer external to a secured network, access a computer on the network through the mapping of a port on the network's firewall to a port on a specified computer.

Pot –

1) Slang for an overhead transformer.
2) 2) Short for "Potential".

Potential –

The voltage in a circuit. Reference is usually to the AC Voltage.

Potential Transformer –

A transformer used measure the amount of Voltage in a circuit. Its primary is rated in excess of the expected voltage of the circuit and the secondary will normally be rated at 120 volts being equal to the nominal full primary voltage.

Pothead –

Slang for a device used to transition an overhead conductor to underground. Potheads are normally porcelain and have been largely replaced with non-ceramic, synthetic rubber, terminators of the type manufactured by Thomas & Betts Elastimold.

POW –

Point-on-Wave. Point-on-wave switching is the process to control moment of switching to minimize the effects (inrush currents, over-voltages).

Power –

Rate at which energy is released or consumed, expressed in watts.

Power Electronics Device –

An electronic device (e.g. thyristor or IGBT) or assembly of such devices (e.g. inverter). Typically used in a power transmission system to provide smooth control of output of an item of plant.

Power Exchange –

See California Power Exchange.

Power Factor –

The ratio of energy consumed (watts) versus the product of input voltage (volts) times input current (amps). In other words, power factor is the percentage of energy used compared to the energy flowing through the wires. Adding capacitors to the system changes the inductive effect of the ballast coils, converting a Normal Power Factor (NPF) to a High Power Factor (HPF) system. At the generator, voltage and current rise and fall at the same time, this is called unity. As resistance and load is applied, the current and voltage separate, one leading the other; the difference (in percentage) between them is called the power factor.

Power Line Carrier Communication –

A mean of transmitting information over a power transmission line by using a carrier frequency superimposed on the normal power frequency.

Power Marketer –

An entity that takes title to electric power and then resells the power to end-use customers. This "middleman," which acts for itself in negotiating contracts, purchases, or sales of electrical energy, is required to meet two FERC tests to be certified as a power marketer: 1) show lack of adequate mitigation of transmission power; and 2) prove non-dominance of market power.

Power Source –

The voltage provided to power the operating equipment. Usually 120 VAC or 277 VAC, but also be station battery voltages of 24, 48 or 125 VDC.

Power Transformer –

A large transformer, generally larger than 1,000 kVA in capacity.

PPP –

Point-to-Point Protocol. PPP is the internet standard for serial communications. PPP defines how modem connection exchanges data packets with other systems on the internet.

PPTP –

Point-to-Point Tunneling Protocol. PPTP is a protocol that allows secure transmission of data in TCP/IP packets. PPTP protocols are used to carry secure communications over Virtual Private Networks that use public phone lines.

Pre-insertion Reactors –

Small reactors used to limit inrush current, normally used on switchgear.

Prohibited Approach Boundary –

An approach limit at a distance from an exposed live part within which work is considered the same as making contact with the live part.

Protected Zone –

The portion of a power system protected by a given protection system or a part of that protection system.

Protection Equipment –

The apparatus, including protection relay, transformers and ancillary equipment, for use in a protection system.

Protection Relay –

A relay designed to initiate disconnection of a part of an electrical installation or to a warning signal, in the case of a fault or other abnormal condition in the installation. A protection relay may include more than one electrical element and accessories.

Protection Scheme –

The coordinated arrangements for the protection of one or more elements of a power system. A protection scheme may compromise several protection systems.

Protection System –

A combination of protection equipment designed to secure, under pre-determined conditions, usually abnormal, the disconnection of an element of a power system, or to give an alarm signal, or both.

Protective Device Numbers, ANSI –

2 Time-delay, 21 Distance, 25 Synchronism-check, 27 Under voltage, 30 Annunciator, 32 Directional power, 37 Undercurrent or under power, 38 Bearing, 40 Field, 46 Reverse-phase, 47 Phase-sequence voltage, 49 Thermal, 50 Instantaneous overcurrent, 51 AC time overcurrent, 59 Overvoltage, 60 Voltage balance, 63 Pressure, 64 Apparatus ground, 67 AC directional overcurrent, 68 Blocking, 69 Permissive, 74 Alarm, 76 DC overcurrent, 78 Out-of-step, 79 AC reclosing, 81 Frequency, 85 Carrier or pilot-wire, 86 Lockout, 87 Differential, 94 Tripping.

Protocol –

Protocols are communication standards set to facilitate the many connections made by computers via modems and other digital connections. Some protocols are PPP, TCP/IP, SLIP, and FTP.

Proxy Server –

A system that caches items from other servers to speed up access. On the web, a proxy first attempts to find data locally, and if it is not available, obtains it from the remote server where the data resides permanently.

PS (Lighting) –

Pole Spacing

Psi –

Pounds per square inch

PSTN –

Public Switched Telephone Network is the concentration of the world's public circuit-switched telephone networks. Originally a network of fixed-line analog telephone systems, the PSTN is now almost entirely digital.

PT –

See "Potential Transformer".

PUC –

Public Utility Commission

Pull –

A noun referring to the installation of one or more cables.

Pull Tension –

The tension in pounds or kilograms required to pull a cable or wire into a duct or conduit or into an overhead location.

Pulling –

The act of installing one or more cables.

Pulse –

An electrical signal which departs from an initial level for a limited duration of time and returns to the original level. Example: A sudden change in voltage or current produced by the opening or closing of a contact.

Pulse Device (for Electricity Metering) –

The functional unit for initiating, transmitting, re-transmitting, or receiving electric pulses, representing finite quantities, such as energy, normally transmitted from some form of electricity meter to a receiver unit.

Pulse Initiator –

Any device, mechanical or electrical, used with a meter to initiate pulses, the number of which are proportional to the quantity being measured. It may include an external amplifier or auxiliary relay or both.

PV –

See "Photovoltaic"

PVC –

Polyvinyl chloride, a common thermoplastic insulation and jacketing material used to manufacture building wire and other types of wire and cable. It is also used in the manufacture of plastic conduit.

PX –

See California Power Exchange.

R

Raceway –

An enclosed channel designed expressly for holding conductors and cables, including conduit and tubing, wire ways, and bus ways.

RAM –

Random Access Memory. When an application is run it is called from the permanent storage area such as hard drive, floppy disk, or CD-ROM, and moved into the RAM where, it sends requests to the CPU. Using faster memory can speed up information process time in a computer.

Range –

Nominal operating limits, specified by the lowest calibration point to the highest calibration point.

Rated Capacity (Battery) –

The number of Amp-Hours a battery can deliver under specific conditions (rate of discharge, end voltage, temperature).

Rated Lamp Life –

With regard to lighting, the point in time when 50% of a statistically significant number of lamps has failed.

Rated Output –

The output at standard calibration.

Rating –

The nominal value of an energizing quantity that appears in the designation of a relay. The nominal value usually corresponding to the CT and VT secondary ratings.

Ratio Correction –

A feature of digital relays that enables compensation to be carried out for a CT or VT ratio that is not ideal.

RCD –

Residual Current Device. A protection device which is actuated by the residual current.

Reactance –

The opposition of inductance and capacitance to alternating current equal to the product of the sine of the angular phase difference between the current and voltage.

Reactive Power –

A component of apparent power (volt-amps) which does not produce any real power (watts) transfers (the sine of the phase angle between the current and the voltage). It is measured in VARs volt-amps reactive.

Reading –

The expected output at a given input value.

Real Power –

The average value of the instantaneous product of volts and amps over a fixed period of time in an AC circuit.

Recloser –

A switching device that rapidly recloses a power switch after it has been opened by an overload. In reclosing the power feed to the line, the device tests the circuit to determine if the problem is still there. If not, power is not unnecessarily interrupted on the circuit.

Recombination (Battery) –

State in which the hydrogen and oxygen gasses normally formed within the battery cell during charging are recombined to form water.

Reed Switch –

A switch that is enclosed in a small glass tube, that is controlled by a magnet(s) or magnetic field acting on it. Used in mercury-wetted latching relays.

Reel –

A cylinder device used to hold wire and cable until installed. There are standard reel sizes that are used in the electrical industry that are either wood (non-returnable) or steel (returnable).

Reference range –

A specific range of values of an influence quantity within which the transducer complies with the requirements concerning intrinsic errors.

Reference value –

A specified single value of an influence quantity at which the transducer complies with the requirements concerning intrinsic errors.

Reference Conditions –

Conditions of use for a transducer prescribed for performance testing, or to ensure valid comparison of results of measurement.

Reflector –

A device used to re-direct the luminous flux from a light source by the process of reflection.

Refractor –

A device used to re-direct the luminous flux from a light source by the process of refraction.

Regulating Transformer –

A transformer used to vary the voltage, or phase angle, of an output circuit. It controls the output within specified limits and compensates for fluctuations of load and input voltage.

Regulation –

See "Voltage Regulation".

Regulator –

A device that is used to control the voltage of a circuit by raising and lowering it.

Reinforced Polymer Motor –

Also referred to as "RPM". See "Polymer Concrete".

Relay - Numerical –

A protection relay which utilizes a digital signal processor to execute the protection algorithms in software.

Relays - Distance –

Relays used on transmission lines that use a variety of sensors and measurements to determine when an unusual condition exists at some distance, out on the transmission circuit.

Relays - Over-current –

Protective relays used on power systems that detect excessive currents and send signals to protective devices, such as power circuit breakers.

Relays - Voltage –

Protective relays used on power systems that detect when line voltage has gone outside of an acceptable range, either up or down, and send a signal to a protective device or system.

Remote Control Point –

The remote control point is a SCADA interface. Several RCP's may be managed with connections are done at a gateway or at substation computers.

Resealable Cap (Battery) –

A safety vent valve which is capable of closing after each pressure release from within a cell.

Resetting value –

The limiting value of the characteristic quantity at which the relay returns to its initial position.

Residential (Lighting) –

A residential development, or a mixture of residential and small commercial establishments, characterized by few pedestrians during nighttime hours. This definition includes area with single-family homes, townhouses, and/or small apartment buildings.

Residual Current –

The algebraic sum, in a multi-phase system, of all the line currents.

Residual Voltage –

The algebraic sum, in a multi-phase system, of all the line-to-earth voltages.

Resistance –

The opposition to current flow, expressed in ohms.

Response Time –

The time for a measurement device's output signal to reach 99% of its final value after a step change in the applied input.

Restricted Approach Boundary –

An approach limit at a distance form an exposed live part within which there is an increased risk of shock, due to electrical arc over combined with inadvertent movement, for personnel working in close proximity to the live part.

Reversible Output Current –

An output current which reverses polarity in response to a change of sign or direction of the measurand.

RHH –

A rubber or XLPE insulated conductor designed to be used at operating temperatures up to 90 degrees Celsius in dry locations.

RHH-2 –

A rubber or XLPE insulated, moisture resistant conductor designed to be used at operating temperatures up to 90 degrees Celsius in dry and wet locations.

Ridge Pin –

A device that allows the mounting of a pin type insulator to a pole. The ridge pin is bolted to the top of the pole and the insulator is screwed onto the threads at its top.

Ripple –

The magnitude of AC fluctuation in a DC signal, after filtering. Ripple is usually expressed as a percentage of rated output.

Ripple Content of the Output –

With steady-state input conditions, the peak-to-peak value of the fluctuating component of the output.

Riser Pole –

A pole used to transition from overhead and underground cables.

RJ-11 –

Registered Jack 11. Standard telephone connector which has a tab that snaps into the socket and must be pressed to be removed from telephone or socket. Usually houses two wires but is capable of housing up to four.

RJ-45 –

Registered Jack 45. Connectors used to connect computers to LANs or phones with many lines. It is able to house up 8 wires that is twice as many wires as the RJ-11.

RMS –

See "Root-Mean-Square".

RMU –

Ring Main Unit.

ROCOF –

Rate of Change of Frequency.

Root-Mean-Square –

The effective value of alternating current or voltage. The RMS value equates an AC current or voltage to a DC current or voltage that provides the same power transfer.

Router –

Device utilized to route data from one local-area network to another or to a phone line's long-distance line.

RPM –

Reinforced Polymer Mortar. See "Polymer Concrete".

RTO –

Regional Transmission Organization.

RTS –

Request to Send. An RTS is a message sent by a networked device to its access point, seeking permission to send a data packet.

RTU –

Remote Terminal Unit. An IED used specifically for interfacing between a computer and other devices. Sometimes may include control, monitoring, or storage functions.

RW (Lighting) –

Roadway Width

S

S.I.R. –

System Impedance Ratio

Sag –

The amount of vertical displacement of an overhead conductor between support points. Sag is a consideration when designing a pole or tower line and will be a determining consideration in the overall height of the structure. Sag varies with the temperature.

SAIDI –

A distribution system reliability measure of the system average interruption duration index. It is commonly measured in customer minutes of interruption and is commonly used as an electric service performance metric.

SAIFI –

A distribution system reliability measure of the system average interruption frequency index. It measures sustained outages and interruptions and is a metric for the entire power system.

SAT –

Site Acceptance Test. Validation procedures for equipment executed with the customer on site.

SCADA –

Supervisory Control and Data Acquisition.

Scaling Resistor –

A resistor added to an output circuit of measurement equipment to provide a scaled voltage output. The output is not a "true" voltage output and may be susceptible to loading errors.

Schematic Diagram –

A diagram which shows, by means of graphic symbols, the electrical connections and functions of a circuit.

SCP –

Substation Control Point. HMI computers at substation level allowing the operators to control the substation.

SCS –

Substation Control System.

Sealed Cell (Battery) –

Cells that are free from routine maintenance and can be operated without regard to position.

Secondary-Class –

Considered low-voltage lightning arresters, they are used on voltages of 650 volts or below.

Self-Discharge (Battery) –

The decrease in the state of charge of a battery or cell, over a period of time, due to internal electro-chemical losses.

Self-Healing –

Scheme designed by using electronic recloser control settings and associated remote communications infrastructure to coordinate service restoration in a given electrical distribution system.

Semi-Con –

The semi-conducting material extruded over the insulation on medium voltage insulated cables. It is extruded onto the cable, normally at the same time as the insulation. Speed Systems manufactures stripping tools to remove the semi-con layer.

Semi-Crystalline –

See "Multi-Crystalline".

Semi-cutoff (Lighting) –

Luminaire light distribution is classified as semi-cutoff when the candlepower per 1000 lamp lumens does not numerically exceed 50 (5.0%) at an angle of 90 degrees above nadir (horizontal), and 200 (20%) at a vertical angle of 80 degrees above nadir. This applies to any lateral angle around the luminaire.

Sense Voltage –

The voltage used to detect the contact opening or closing operation of a pulse initiator, either in a watt-hour meter, gas meter or water meter. Industry convention requires that the receiving device supply the sensing voltage to the sending device (i.e. relay to meter, energy control system to relay). Also called “wetting voltage”.

Separator (Battery) –

A porous, insulating material placed between plates of opposed polarities, to prevent internal short circuits.

SER –

Service Entrance Cable.

Series Connection –

For DC circuits, a way of joining batteries, electrical devices and wires in such a way that positive leads are connected to negative leads. This is generally done to increase voltage.

Series Connected Capacitors –

Most often used as a method of smoothing voltage fluctuations that occur due to large loads switching on and off.

Server –

A computer that provides the information, files, web pages, and other services to the client that logs on to it.

Service Drop –

An overhead service conductor runs from a utility company pole to the point of connection to the building's service entrance conductors.

Service Entrance Cable –

The conductors that connect the service conductors (drop or lateral) to the service equipment of the building.

Service Life (Battery) –

The total period of useful life of a battery, normally expressed in the total number of Charge/Discharge cycles.

Setting –

The limiting value of a 'characteristic' or 'energizing' quantity at which the relay is designed to operate under specified conditions. Such values are usually marked on the relay and may be expressed as direct values, percentages of rated values, or multiples.

SEU –

Service entrance cable.

SFC - Sequential Function Chart –

One of the IEC 61131-3 programming languages.

Shock Hazard –

A dangerous electrical condition associated with the possible release of energy caused by contact or approach to energized parts.

Short Circuit –

1. A load that occurs when at ungrounded conductor comes into contact with another conductor or grounded object. 2. An abnormal connection of relatively low impedance, whether made intentionally or by accident, between two points of different potential.

Short Distribution (Lighting) –

A luminary is classified as having a short light distribution when its max candlepower point falls between 1.0MH - 2.25MH TRL. The maximum luminaire spacing-to-mounting height ratio is generally 4.5 or less.

Shotgun Stick –

A specialized hot stick that allows the capture of certain types of clamps and devices in its hook. It is also called a "Grip All" stick.

Shunt Reactor –

A reactor connected phase to ground.

SI –

See "International System of Units".

Sidewalk (lighting) –

Paved or otherwise improved areas for pedestrian use, located within public street rights-of-way also containing roadways for vehicular traffic.

Sidewall Pressure –

The force exerted on a cable as it is dragged around a bend. The longer the pull and the tighter the bend radius, the higher the sidewall pressure will become. High sidewall pressure damages cable. There is a higher chance of destroying cable by high sidewall pressure than by high tensile tension. Electrical cable manufacturers' specifications limit sidewall pressure to a range of 300 - 1500 lbs./ft., depending on cable type. There are three ways to reduce sidewall pressure while pulling cable with bends: shorten the pull, enlarge the bend radius, or use a high performance lubricant. This allows a designer to play "what if," easily changing pull parameters and instantly seeing the effect on sidewall pressure.

Silicon –

A chemical element (Si), atomic number 14, semi-metallic in nature, dark gray, that is an excellent semiconducting material and is the most common semiconducting material used in making photovoltaic devices.

Simplex Communications System –

A communications system in which data can only travel in one direction.

Single Element Transducer –

A transducer having one measuring element.

Single Phase –

Single Phase electric power refers to the distribution of electric power using a system in which the voltage is taken from one Phase of a three Phase source. Single Phase distribution is used when loads are mostly lighting and heating, with few large electric motors. The generation of AC electric power by electric utilities is nearly always "Three Phase", in which the waveforms of three supply conductors are offset from one another by 120°. The standard frequency in the United States is 60 Hz.

Single-Phase –

This implies a power supply or a load that uses only two wires for power. Some "grounded" single phase devices also have a third wire used only for a safety ground, but not connected to the electrical supply or load in any other way except for safety grounding.

Single-Shot Reclosing –

An auto-reclose sequence that provides only one recloser operation, lock-out of the CB occurring if it subsequently trips.

Sintered Plate (Battery) –

The plate of an alkaline cell, the support of which is made of sintered metal powder, and into which the active material is introduced.

Skin Effect –

In an ac system, the tendency of the outer portion of a conductor to carry more of the current as the frequency of the ac increases.

Sky Wire –

See "Static Wire"

Sleeve –

See "Compression Splice".

Soap –

Slang for "Cable Pulling Lubricant".

SOE –

Sequence of Events

Solar Cell –

See "Photovoltaic Cell".

Solar Energy –

Energy from the sun. The heat that builds up on surfaces exposed to the sun is an example.

Solid State Contacts –

Contacts that switch power that have no moving parts. Contacts are made of a silicon material.

Solid State Relay –

A relay using solid state contacts that switch power that have no moving parts. Contacts are made of a silicon material. Generally solid-state relays are non-latching and have lower power handling capabilities than mercury-wetted relays.

SOTF –

Switch on to Fault (protection).

Spacing-to-Mounting Height Ratio –

Ratio specification used to insure that fixtures are adequately spaded, thus preventing "hotspots".

Span –

1) Refers to the distance between two poles of a transmission or distribution line.

2) The algebraic difference between the upper and lower values of a range.

Spark Gap –

The air space that prevents normal operating voltage from going to ground.

Spark Test –

A high-voltage test performed on certain types of conductor during manufacture to ensure the insulation is free from defects.

Specific Conjunctive Test –

A conjunctive test using specific values of each of the parameters.

Specific-Gravity (Battery) –

The weight of the electrolyte compared to the weight of an equal volume of pure water. It is used to measure the strength or percentage of sulfuric acid in the electrolyte.

Spill Light –

Unwanted light directed onto a neighboring property. Also referred to Light Trespass.

Split Phase –

A split phase electric distribution system is a 3-wire single-phase distribution system, commonly used in North America for single-family residential and light commercial (up to about 100 kVA) applications. It is the AC equivalent of the former Edison direct current distribution system. Like that system, it has the advantage of saving the weight of conductors for the installation. Since there are two live conductors in the system, it is sometimes incorrectly referred to as "two phase".

Spread Spectrum –

A wireless communications technology that scatters data transmissions across the available frequency band in pseudorandom pattern. Spreading the data across the frequency spectrum greatly increases the bandwidth which in turn can reduce noise and provide privacy.

Spring Winding Time –

For spring-closed CB's, the time for the spring to be fully charged after a closing operation.

ST –

Structured Text, one of the IEC 61131-3 programming languages.

Stability –

The ability of a device to maintain its performance characteristics over a specified period of time.

Stability Limits of a Protection System –

The R.M.S. value of the symmetrical component of the through fault current up to which the protection system remains stable.

Stability of a Protection System –

The quantity whereby a protection system remains inoperative under all conditions other than those for which it is specifically designed to operate.

Stability of Transducer –

The ability of a transducer to keep its performance characteristics unchanged during a specified time, all conditions remaining constant.

Stage 3 Emergency –

In the state of California, if power reserves ever fall below 1.5 percent, Cal-ISO, the independent system operator in California, will declare a Stage 3 emergency and the state's investor-owned utilities, may be ordered to immediately reduce the demand for electricity. At that point, the utilities will implement a series of temporary, controlled rotating power outages.

Standard calibration –

The nominal point at which a measurement device is adjusted.

Starter –

A device used in conjunction with a ballast for the purpose of starting an electric discharge lamp.

Starting Current –

Current required by the ballast during initial arc tube ignition. Current changes as lamp reaches normal operating light level.

Starting Relay –

A unit relay which responds to abnormal conditions and initiates the operation of other elements of the protection system.

Starved Cell (Battery) –

A cell containing little or no free fluid electrolyte solution. This enables gasses to reach electrode surfaces readily, and permits relative high rates of recombination.

STATCOM –

A particular type of Static Var Compensator, in which Power Electronic Devices such as GTO's are used to generate the reactive power required, rather than capacitors and inductors.

State of Charge (Battery) –

The available amp-hours in a battery at any point of time. State of Charge is determined by the amount of sulfuric acid remaining in the electrolyte at the time of testing or by the stabilized open circuit voltage.

Static IP address –

See IP address.

Static Relay –

An electrical relay in which the designed response is developed by electronic, magnetic, optical or other components without mechanical motion. Excludes relays using digital technology.

Static Var Compensator –

A device that supplies or consumes reactive power comprised solely of static equipment. It is shunt-connected on transmission lines to provide reactive power compensation.

Static Wire –

A wire placed above the phase wires of a distribution of transmission circuit to protect against lightning. It is normally galvanized or aluminized steel.

Station-Class –

This class of lightning arrester is normally used on voltages above 150 kV.

STC –

Short Time Current rating of a CT.

Stick –

See Hot stick.

Stinger –

Slang for the wire connecting a fused cutout or switch to a transformer bushing.

Storage Conditions –

The conditions defined by means of ranges of the influence quantities, such as temperature, or any special conditions, within which the transducer may be stored (non-operating) without damage.

Strand –

One of the wires that made up a stranded conductor.

Stranded Conductor –

A conductor made by twisting together a group of wire strands.

Stranded Cost –

Assets owned by an investor owned electric utility, normally costs associated with generation-related assets and state-mandated contracts with nonutility generators that may now be uneconomic and unrecoverable in the restructured electric utility industry.

Stringing –

The act of installing overhead electrical wire or conductor.

Stringing Block –

A sheave used to support and allow movement of a cable that is being installed. These are normally used overhead but there are also specialized designs used at the entrance to a conduit system. Stringing blocks are manufactured by Bethea.

Stringing Dolly –

See "Stringing Block".

Sub-Transmission System –

A high voltage system that takes power from the highest voltage transmission system and reduces it to a lower voltage for more convenient transmission to nearby load centers, delivering power to distribution substations or the largest industrial plants. Typically operating at voltages from approximately 35 kV to 100 kV.

Substation Configuration Language –

Normalized configuration language for substation modeling as expected by IEC 61850-6.

Sulfation (Battery) –

The formation of lead sulfate of such physical properties that it is extremely difficult, if not impossible, to reconvert it to active material.

Sulfur-Hexafluoride (SF6) –

A very dense, inert, non-conducting gas used inside high voltage equipment to insulate conducting components from surfaces at ground potential. It also is used as an interrupting medium in high voltage circuit breakers and circuit switchers.

Super Draw Lead –

Also known as a split conductor. Historically bushings offered a draw lead rating of 400 amps, but by using Trench's split conductor in COTA bushings the draw leads now have ratings of 3,000 amps.

Surge Arrester –

A piece of equipment insulated to withstand normal operating voltages usually made of porcelain or polymer. A surge arrester has an internal air gap and elements that permit overvoltages to flow through but act to stop the normal 50-60 hertz flow of electricity.

Surge Withstand –

A measure of an electrical device's ability to withstand high-voltage or high-frequency transients of short duration without damage.

Surge Withstand Capability (swc) Test –

The SWC test wave is an oscillatory wave, frequency range of 1-1.5 MHz, voltage range of 2.5-3 kV crest value of first peak, envelope decaying to 50% of the crest value of the first peak in not less than 6 micro seconds from the start of the wave. The source impedance is from 150-200. The wave is to be applied to a test specimen at a repetition rate of not less than 50 tests per second for a period of not less than two seconds.

Swelling (Battery) –

The swelling or bulging of a battery case that results from cell vents not allowing enough internal pressure to be relieved.

Switch, Network –

A Switch connects Client systems and servers together to create a network. It selects the path that the data packet will take to its destination by opening and closing an electrical circuit.

Switchgear –

A general term covering switching and interrupting devices and their combination with associated control, metering, protective and regulating devices. Also, the assemblies of these devices with associated interconnection, accessories, enclosures and supporting structure, used primarily in connection with the generation, transmission, distribution and conversion of electric power.

Switching Impulses –

See "Lightning and Switching Impulses".

Switching Surges –

High voltage spikes that occur when current flowing in a highly inductive circuit, or a long transmission line, is suddenly interrupted. As the magnetic field about the inductive conductor collapses, a brief by very high voltage can be generated at the terminal point of the circuit.

System Disturbance Time –

The time between fault inception and CB contacts making on successful re-closure.

System Impedance Ratio –

The ratio of the power system source impedance to the impedance of the protected zone.

T

T&D –

Transmission and Distribution.

T-Body –

A device used to terminate main feeder cables operating at medium voltages (4-35KV nominal). T-Bodies are molded from synthetic rubber and are electrically shielded. They are frequently stacked for multiple terminations and are rated at 600 Amps and are classed "Non-Load break".

“T1” and “T2” Leads –

The time control (end-of-interval) leads coming off of most meters. Normally a Form A contact closure to a two-wire transmission system. Because meter pulse initiators can be programmed for different functions, an end of interval pulse may come off of an output labeled K and Y.

T101 –

Term used for IEC 60870-5-101 protocol.

Tag Line –

A rope used to control the position of equipment being lifted. This is not to be confused with the rope used to actually lift the equipment.

Tap Changer –

A mechanism usually fitted to the primary winding of a transformer, to alter the turn's ratio of the transformer by small discrete amounts over a defined range.

TC57 –

Technical Committee 57 working for the IEC and responsible for producing standards in the field of protection (e.g. IEC 61850).

TCP/IP –

Transmission Control Protocol/Internet Protocol. TCP/IP is the method by which data is sent across the internet. These two protocols were developed by the U.S. military to allow computers to talk to each other over long distance networks.

Temper –

The softness of a metal; terms such as soft-drawn, dead soft, annealed, and semi-annealed are used to describe tempers used for conductor metals.

Temperature Rise –

The increase in temperature that results when electrical load is carried by electrical equipment.

Tensile Strength –

The greatest longitudinal force that a substance can bear without tearing apart or rupturing; also called ultimate tensile strength.

Tension –

The force in pounds of kilograms on a conductor installed overhead. Too much tension on an overhead line can contribute to mechanical failure.

Termination –

1) The act of preparing the connection or transition of an insulating cable. 2) The device that transitions an underground cable to an overhead cable or wire. Speed Systems manufactures tools used to terminate cables.

Terminator –

A device used to transition between overhead and underground, medium and high voltage conductors.

Testing the Ground Grid –

Conducting earth resistivity tests to make sure the copper ground grid will perform as required.

TF –

The Transfer Function of a device usually an element of a control system.

TFE –

A Heat-resistant insulation compound made with tetrafluoroethylene (Teflon).

Thermal Expansion –

The expansion of a material when subjected to heat.

Thermo Imaging Camera –

Devices that read the heat being given off by objects. These devices are sensitive to the infrared band of light which is between visible light and radio waves.

Thermoplastic –

A plastic compound that will soften and melt with sufficient heat. Thermoplastic insulation compounds are used to manufacture certain types of electrical cables.

Thermoset –

A plastic compound that will not re-melt. Thermoset insulation compounds are used to manufacture certain types of cables.

THHN –

A thermoplastic-insulated, nylon-jacketed conductor designed for use in dry locations and an operating temperature of up to 90 degrees Celsius.

Thin Film –

See "Amorphous Semiconductor"

Thin Film (Photovoltaic) –

A layer of semiconductor material, such as copper indium diselenide, cadmium telluride, gallium arsenide, or amorphous silicon, a few microns or less in thickness, used to make photovoltaic cells.

Three Phase –

Three-phase refers to an electric power system having at least three conductors carrying voltage waveforms that are 2ð/3 radians (120°,1/3 of a cycle) offset in time. Electric utilities generate three phase power and transmit it to load centers where it may be consumed at Three Phase or Single Phase. Also see "Polyphase".

Three Wire –

See Delta.

Three-Phase –

Multiple phase power supply or load that uses at least three wires where a different voltage phase from a common generator is carried between each pair of wires. The voltage level may be identical but the voltages will vary in phase relationship to each other by 120 degrees.

Through Fault Current –

The current flowing through a protected zone to a fault beyond that zone.

Throughput –

A general term used when defining the rate of data transfer over a particular medium, such as a wireless network or a phone line.

Thumper –

A high voltage device used to locate an underground cable fault. The device applies a high voltage to the faulted cable with a resulting discharge to ground at the location of the fault. When the discharge occurs, there is an audible "Thump" which is used to locate the fault.

THW –

A thermoplastic insulated, moisture resistant conductor designed for use in wet or dry locations and an operating temperature of up to 75 degrees Celsius.

THWN-2 –

A thermoplastic insulated, nylon-jacketed, moisture resistant conductor designed for use in wet or dry locations and an operating temperature of up to 75 degrees Celsius.

Tie –

A wire device that connects a conductor to an insulator. Factory formed ties are manufactured by Preformed Line Products Company.

Time Delay –

A delay intentionally introduced into the operation of a relay system.

Time Delay Relay –

A relay having an intentional delaying device.

Tow Axis Tracking (Photovoltaic) –

A photovoltaic system capable rotating on two axes (vertical and horizontal) to track the sun for maximum efficiency of the solar array.

TPI –

Tap Position Indicator for transformers.

Tracking Array (Photovoltaic) –

A photovoltaic array that follows the path of the sun to maximize the solar incident on the photovoltaic surface.

Transco –

A for profit Power Transmission Company.

Transducer –

A device for converting an electrical signal into a usable direct current or voltage for measurement purposes.

Transducer Error –

The actual value of the output minus the intended value of the output expressed algebraically.

Transducer Factor –

The product of the current transformer ratio (CTR) and the voltage transformer ratio (VTR). Also called the power ratio.

Transducer with Live Zero –

A transducer which gives a predetermined output other than zero when the measurand is zero.

Transducer with Suppressed Zero –

A transducer whose output is zero when the measurand is less than a certain value.

Transformer –

An electro-magnetic device used to change the voltage in an alternating current electrical circuit.

Transformer Bank –

See "Bank".

Transformer Insulation –

This is the material that is used to provide electrical insulation between transformer windings at different voltage levels and also between the energized parts and the metal tank of the transformer. Generally, for large transformers used in power applications, this is a combination of Kraft paper and mineral oil; however, in indoor building applications, transformers also may be insulated with plastic materials.

Transformer Ratio –

When used in reference to Instrument Transformers, this is simply the ratio of transformation of one or more transformers used in the circuit. If both CTs and VTs are included, the transformer ratio is the product of the CT and the VT. For example, assume a VT with a ratio 10:1 and a CT with a ratio of 20:1, then the combined transformer ratio is 10 x 20 = 200:1.

TTR –

Transformer Turns Ratio, the ratio of the number of turns in the primary winding of a transformer to the number of turns in the secondary winding.

Transformer Voltage Regulators –

Mechanisms that use multiple voltage taps on a transformer-like device to adjust voltage on a power line. As the voltage increases or decreases on the circuit, sensors in the voltage regulator call for the input or output of the regulator to connect to different voltage taps on the transformer winding. This adjusts the output voltage on the line to an acceptable level.

Transient –

See "Voltage Transient"

Transmission System –

Normally, the highest voltage network of an electric utility system. This is the portion of the system that carries high power over the longest distances. Typically operating at voltages in excess of 100 kV, and most usually at 200 kV and above.

Traveler –

See "Stringing Block".

Tree Wire –

A type of Overhead Distribution Wire that is insulated for momentary contact with tree branches and used as a primary voltage conductor.

Treeing –

Water treeing is a form of cable insulation degradation where micro-channels, which often appear as a tree-like structure in the insulation, develop due to a complex interaction of water, electrical stress, impurities and imperfections. The tree-like channels grow slowly over time, weakening the insulation and, in some cases, lead to cable failure.

Trickle Charge (Battery) –

A continuous low rate charge that compensates for the self-discharge rate of a battery. Also known as Float Charge.

True RMS Amps –

1) The effective value of an AC signal. For an amp signal, true RMS is a precise method of stating the amp value regardless of waveform distortion. 2) An AC measurement which is equal in power transfer capability to a corresponding DC current.

True RMS volts –

1) The effective value of an AC voltage value regardless of the waveform distortion.
2) An AC measurement which is equal power transfer capability to a corresponding DC voltage.

TRXLP –

Tree Retardant Cross Linked Polyethylene. A thermoset plastic compound that is used for insulation of wire and cable containing an anti-treeing compound.

Tubular Plate (Battery) –

A positive plate which is composed of assembly of porous tubes of perforated metal or tissue with or without a central current collector spine. The active material is placed within the tube.

Tungsten Halogen Lamp –

A gas-filled tungsten halogen lamp containing a certain proportion of halogens.

TW –

1) A thermoplastic insulated, moisture resistant conductor designed for use in wet or dry locations and an operating temperature of up to 60 degrees Celsius. 2) Trapezoidal Wire. Built as ACSR-TW or ACSS-TW, Trapezoidal Wire uses trapezoidal formed strands in its construction to reduce overall diameter of the finished cable.

Twenty A –

See 20A.

Twenty B –

See 20B.

Twenty C –

See 20C.

Twisted Pair –

Telephone companies commonly run twisted pairs of cooper wires to each customer household. The pairs consist of two insulated cooper wires twisted into a spiral pattern. These wires are capable of transferring both voice as well as data.

U

UCA –

Utility Communications Architecture.

UD –

Underground Distribution

UF –

A thermoplastic insulated, underground feeder conductor or cable designed for use in wet locations, including direct burial.

UHV –

See "Ultra High Voltage".

UL –

Underwriters Laboratories, Inc. UL is located at 333 Pfingsten Road, Northbrook, IL 60062.

Ultra High Voltage (UFV) –

Electric systems in which the Root-Mean-Square ac voltage exceeds 800,000 volts.

Unbalanced Loads –

Refers to an unequal loading of the phases in a polyphase system.

Underground Residential Distribution (URD) –

Refers to the system of electric utility equipment that is installed below grade.

Underground Utility Structure –

An enclosure for use underground that may be either a hand hole or manhole.

Unidirectional Unit –

Allows inputs to be measured in one direction only. The stated output range indicates the minimum and maximum input levels.

Unit Electrical Relay –

A single relay that can be used alone or in combinations with others.

Unit Protection –

A protection system that is designed to operate only for abnormal conditions within a clearly defined zone of the power system.

Universal Bushing Well –

This 200 amp rated component is used as part of a system to terminate medium voltage cables to transformers, switchgear and other electrical equipment. Universal Bushing Wells are manufactured by the Elastimold Division of Thomas & Betts.

Unrestricted Protection –

A protection system which has no clearly defined zone of operation and which achieves selective operation only by time grading.

UPS –

Uninterruptable Power Supply

URD –

Underground Residential Distribution.

USE –

Underground Service Entrance conductor or cable.

USMA –

Utility Supply Management Alliance, a utility industry conference held annually that is focused on the supplier/customer relationship.

V

V –

Voltage; Volt.

VA –

1) Electrical capacity or electrical load, expressed as Volts x Amps. 2) Volt Ampere rating designates the output which a transformer can deliver at rated voltage and frequency without exceeding a specified temperature rise.

VAC –

Volts AC.

Vacuum Circuit Breakers –

Circuit breakers, normally applied at medium voltages that use vacuum interrupters to extinguish the electrical arc and shut-off flowing current.

Vacuum Interrupter –

A sealed "bottle" containing contacts of a switch inside a very high vacuum. When the contacts are parted in the vacuum, as there is no gas in the bottle to ionize, the current flow is quickly extinguished.

Valve Regulated Sealed Cell (Battery) –

A battery in which the cells are closed but have a valve which allows the escape of gas if the internal pressure exceeds a predetermined value (pressure).

Vapor Phase –

In the core-type transformer, the core-and-coil assembly is independent of the tank, so that the assembly is allowed to completely dry. When drying the core-and-coil assembly, vapor phase drying method is used, in which special oil vapor is sprayed on the assembly to utilize latent heat produced when the oil vapor condenses. Since heating is effected deep inside evenly and quickly, the assembly can be completely dries without causing damage to the insulation.

VAR –

Volt Ampere Reactive. Also see "Reactive Power".

VCB –

Vacuum Circuit Breaker.

VDC –

Volts DC.

VDEW –

Term used for IEC 60870-5-103 protocol. The VDEW protocol is a subset of the IEC 60870-5-103 protocol.

Vector Group Compensation –

A feature of digital and numerical relays that compensates for the phase angle shift that occurs in transformers due to use of dissimilar winding connections. For example transformers connected in delta/star.

Veiling Luminance –

A luminance superimposed on the retinal image which reduces its contrast. It is this veiling effect produced by bright sources or areas in the visual field that results in reduced visual performance and visibility.

Vent Cap (Battery) –

The plug on top of a cell that can be removed to check and change the level of the electrolyte.

Vent Valve (Battery) –

A normally sealed mechanism which allows the controlled escape of gasses from within a cell.

Venting (Battery) –

The release of gas from a cell, either controlled (through a vent) or accidental.

Virtual Server –

The part of a server that functions as if it were a separate, dedicated server. Each virtual server can run its own operating system and applications and even be networked with other virtual servers on the same machine. For instance, web hosting companies use virtual servers to house multiple clients' web sites on one server.

Volt –

A unit of electromotive force. The electrical potential needed to produce one ampere of current with a resistance of one ohm.

Voltage Class –

The general strength of electrical insulation on a device, determining the maximum continuous voltage that can be applied between the conducting parts and ground potential, without damaging the insulation.

Voltage Drop –

The loss of voltage in a circuit when current flows.

Voltage Gradient –

See "Voltage Drop"

Voltage Rating –

The normal voltage to be applied to an electrical device to provide for proper operation.

Voltage Regulation –

The maintenance of a voltage level between two established set points, compensating for transformer and/or line voltage deviation, caused by load current. The voltage change is affected by the magnitude and the power factor of the load current.

Voltage Sag –

Voltage Sags are momentary (typically a few milliseconds to a few seconds duration) under-voltage conditions and can be caused by a large load starting up (such as an air conditioning compressor or large motor load) or operation of utility protection equipment. Sags often appear as flickering lights and can cause equipment shutdown. A sag of just a few milliseconds can mean a complete blackout to some sensitive equipment.

Voltage Spread –

The difference between maximum and minimum voltages.

Voltage Swells –

Voltage Swells are momentary (typically a few milliseconds to a few seconds duration) over-voltage conditions which can be caused by such things as a sudden decrease in electrical load or a short circuit occurring on electrical conductors. Voltage swells can affect the performance of sensitive electronic equipment, because data errors, produce equipment shutdowns, and may cause equipment damage.

Voltage Transducer –

A transducer used for the measurement of a.c. voltage.

Voltage Transformer –

Transformer used to accurately scale ac voltages up or down, or to provide isolation. Generally used to scale large primary or bus voltages to usable values for measuring purposes.

Voltage Transformer Ratio –

The ratio of primary volts divided by secondary volts.

Voltage Transients –

A transient (sometimes called impulse) is an extremely fast disturbance (millionths of a second to a few milliseconds) evidenced by a sharp change in voltage. Transients can occur on your electric, phone, or even cable TV lines. They can be caused by such things as lightning, trees falling on power lines, ice and snow, and cycling equipment ON and OFF. Transients can originate from inside or outside your home. Equipment, such as air conditioning, pump motors, photocopiers, and even electric hand tools can all cause transients when cycled on and off. These impulses are similar to lightning strikes but are much smaller. However, because they can occur frequently, they can slowly cause electronic equipment to break down.

Voltage Withstand Test –

A field or factory test in which a conductor or electrical equipment is subjected to a higher than normal AC or DC voltage to test its insulation system.

VPN –

Virtual Private Network. A private network of computers that is partially connected by public phone lines.

VR Cable –

AAC or ACSR with Vibration Resistant Twisted Pair Construction.

VT –

See "Potential Transformer".

W

W.U.C. –

See "Western Underground Committee"

WAN –

Wide-Area Network. Composed of two or more local-area networks (LANs). Can be made up of interconnected smaller networks spread throughout a building, a state, or the entire globe.

WAPA –

Western Area Power Administration

Watt –

1) With ac measurements, effective power (measured in Watts) equals the product of voltage, current, and power factor (the cosine of the phase angle between the current and the voltage). Watts=EI cosine (Theta). A Watt is a unit of power that considers both volts and amps and is equal to the power in a circuit in which a current of one ampere flows across a potential difference of one volt. 2) One joule/second.

Watt-Hour –

1) A unit of work equal to the power of one watt operating for one hour. 2) 3600 Joules.

Western Underground Committee –

Committees of western based electric utility engineers that provide a forum for establishment of guides that provide options, recommendations and practices for its members. These guides are used to assist its members in preparing their own specifications and to make recommendations to specifying agencies.

Wi-Fi –

Wireless Fidelity. Wi-Fi originally referred to the 802.11b specification for wireless LANs, but it is now used to describe any of the 802.11 wireless networking specifications.

Wire –

A strand or group of strands of electrically conductive material, normally copper or aluminum.

Wire Lubricant –

A chemical compound used to reduce pulling tension by lubricating a cable when pulled into a duct or conduit.

Wireless Bridging –

A networking bridge is used to connect two or more separate networks. A wireless bridge functions similar to a wireless network but can be used in situations in which running a cable would be impractical or expensive.

WLAN –

Wireless Local Area Network. A wirelessly connected Local Area Network (See LAN).

Work Plane –

The plane at which work is usually done and on which the luminance is specified and measured. Unless otherwise indicated, this is assumed to be a horizontal plane 30" above the floor.

Working Near –

Refers to working near live parts. Any activity inside a limited approach boundary.

Working On –

Refers to working on live parts. Coming in contact with live parts with the hands, feet, or other body parts, with tools, probes, or test equipment, regardless of the personal protective equipment a person is using.

WPA –

Wi-Fi Protected Access. WPA is a security specification for the 802.11 standards replacing the less effective WEP. It uses 802.1x and EAP to restrict network access, and it uses its own encryption called Temporal Key Integrity Protocol (TKIP).

WPAN –

Wireless Personal-Area Network. WPAN is a PAN that uses wireless means of connecting, however since all PAN technologies, such as Bluetooth, are wireless, you can consider the terms synonymous.

WUC –

See "Western Underground Committee".

Wye –

A three phase, four-wire electrical configuration where each of the individual phases is connected to a common point, the "center" of the Y. This common point normally is connected to an electrical ground.

X

X –

Reactance expressed in Ohms.

XHHW-2 –

An XLPE insulated, moisture resistant conductor designed for use in wet or dry locations and an operating temperature of up to 90 degrees Celsius.

XLP –

See "XLPE"

XLPE –

Cross-Linked Polyethylene. A thermo set plastic compound that is used for insulation of wire and cable.

Xmodem –

A protocol for transferring files during direct dial-up communications. Developed by Ward Christensen in 1977, Xmodem does error checking to ensure that information is not lost or corrupted during transfer of 128 byte blocks. Since its development it has undergone a couple of enhancements such as Xmodem CRC uses a more reliable error correction scheme, and Xmodem-1K transfers data by 1,024-byte blocks.

Y

Y –

See "Wye".

Yield Strength –

The force required to stretch a material.

“Y” and “Z” Leads –

Analogous to the normally-open and normally-closed contacts, respectively, of a Form C or single-pole, double-throw switch. In Form C pulse meter, the Y and Z terminals are always opposite of each other. In other words if the K-Y switch is closed, K-Z switch is open.

Z

Z -

Impedance

Zero Crossing –

The point at which a sinusoidal voltage or current waveform crosses the zero reference axis.

Glossary of Terms for Communications – Electronics

Considering the rapid pace of change in communications and electronics, the North Carolina Electric Meter School and Grid Technology Conference recommends that the student take advantage of the internet to locate a suitable glossary of terms.

Using your search engine of choice, type in “Glossary of Communications-Electronics Terms”.

This search should bring many varied results/resources to choose from.

Another possible resource is the “IEEE Dictionary”. Again, this can be searched for and ordered on the internet.