Glossary of Electrical and Mechanical Terminology and Definitions

EGSA 101G, 1998

Electrical Generating Systems Association
1650 S. Dixie Highway, 4th Floor
Boca Raton, Florida 33432
Phone: (561) 750-5575 • Fax: (561) 395-8557
www.egsa.org

EGSA 101G 1998
GLOSSARY OF ELECTRICAL AND MECHANICAL TERMINOLOGY AND DEFINITIONS

GLOSSARY OF TERMS

accuracy. The comparison of an indicated value to a known reference value. The quality of accuracy is often expressed by stating the difference between the two values as a percentage of the known reference value.

A/D converter. A device that converts an analog signal such as generator output voltage into a digital "word" for use by a microprocessor.

aeration. The entrainment of gas (air and/or combustion gas) in the coolant.

aftercooling. Process by which the combustion chargeair exiting from the final stage of compression is cooled by means of an air to air, or liquid to air, heat exchanger, before introduction into the engine.

air bleed. Pressurized air extracted from the gas turbine engine compressor.

air cleaner. Device to filter combustion air at the entrance to the combustion air circuit.

air cooled engine. An engine that is cooled by means of air being forced about the heated parts of the engine.

air gap. A separating space between two parts of magnetic material through which the magnetic flux must pass. A typical representation of this space is the clearance between the rotor and stator of an electrical machine.

air intake silencer. Device to reduce the noise of incoming combustion air and objectionable noise originating in the intake manifold.

air restrict indicator. A device applied in conjunction with a dry-type air cleaner to signal the necessary maintenance of the filter cartridge as determined by an increased restriction to air flow.

air/gas starting. Utilizing compressed air or gas for engine or turbine cranking.

$$\textbf{air-fuel ratio} = \frac{\text{mass of delivered air}}{\text{mass of delivered fuel}}$$

alternating current (ac). A current which reverses in regularly recurring intervals of time and which has alternately positive and negative values, and occurring a specified number of times per second. The number is expressed in Hertz (cycles per second).

alternator. A device for converting mechanical energy into alternating current electrical energy. It may be called an ac or synchronous generator.

alternator, battery charging. An engine driven ac generator, usually self regulating, and self rectifying which provides dc for the purposes of re-charging the starting batteries, and provides power to engine control and monitoring systems. These alternators are usually about 1 to 3 kW at either 12 volts or 24 volts in output.

altitude. The vertical elevation relative to sea level at which the generating system is operating.

altitude rating. The maximum power recommended by the manufacturer for satisfactory operation at a given altitude.

ambient temperature. The air temperature of the surroundings in which the generating system or other applicable electrical equipment operates. The ambient temperature for optimum rating of components of the system may vary from device to device.

American Bureau of Shipping (ABS). A marine classification and inspection society which establishes various requirements for shipbuilding and for equipment designed for shipboard use.

American Wire Gauge(AWG). The gauge used for designating the sizes of solid copper wires used in the United States. It is the same as the Brown & Sharp gauge.

ammeter. An instrument for measuring the magnitude of an electric current.

ammeter and voltmeter selector switch. A switching device that permits reading current or voltage in each of the three phases by using a single voltmeter or ammeter.

amortisseur. A permanently short-circuited winding consisting of conductors embedded in the rotor poles of a synchronous machine and connected together at the ends of the poles. It lends stability on load changes and paralleling and improves machine efficiency.

ampacity. The current-carrying capacity, expressed in amperes, of a wire, cable, or bus bar under stated thermal conditions.

ampere. The unit of electric current flow. One ampere will flow when one volt is applied across a resistance of one ohm.

ampere-turn. A unit of magnetizing force. The product of current flowing, measured in amperes, multiplied by the number of turns in a coil or winding.

analog device. A device that operates with variables, such as voltages and pressures, represented by continuously measured quantities.

angle of operation. The maximum deviation from horizontal at which an engine operates in a given application.

apparent power. A term used to describe the product of current and voltage, expressed in kilovolt amperes (kVA). The apparent power in kVA multiplied by the power factor (PF) is the real power in kilowatts (kW).

artifical load. Nonproductive electric power-absorbing devices, which are connected to the generator to simulate or to supplement the actual load.

artifical load (reactive). Load banks to which devices that operate at a lower power factor have been added. Generally, variable reactors are used so that the amount of reactance can be adjusted to match the power factor of the actual load. Air core reactors provide the most stable operation for testing purposes.

artifical load (resistive). Load banks usually consisting of heater coils or strip heaters which operate only at a unity power factor.

artifical load (supplemental). A permanently installed load which is used to supplement the existing load in installations where the electric set is operating at light load (less than 30% of the generator's nameplate rating).

artifical load (water rheostat). A tank containing a salt or brine and water mixture in which electrodes are submerged to create a load. The deeper the electrodes are submerged into the mixture, the greater the load. To stabilize the load, the mixture must not be allowed to boil. This type of artificial load operates at unity power factor.

audible alarm. Horn, siren, bell or buzzer which is used to attract the attention of the operator when a fault occurs in the electric power generating system.

automatic transfer switch. A switch designed to sense the loss of one power source and automatically transfer the load to another source of power.

auxiliary fuel pump. A pump used to transfer fuel from remote storage to the engine.

back pressure. Exhaust system pressure resulting from a restriction to exhaust gas flow.

base mounted fuel tank. Fuel tank that is incorporated into the generating system subbase.

batteries (parallel connected). Two or more batteries whose terminals are connected positive-to-positive and negative-to-negative, with the load connected across the positive and negative leads. The available current is equal to the sum of the individual battery current ratings, and the voltage is the voltage rating of one battery. Only batteries of equal voltage rating may be connected in this manner.

batteries (series connected). Two or more batteries with the positive terminal of one connected to the negative terminal of the next, with the load connected to the negative terminal of the first battery and the positive terminal of the last battery in the series. The voltage is equal to the sum of the voltage ratings of the individual batteries, and the current is limited to the rated current capacity of the smallest battery connected in the circuit.

battery. A device that transforms chemical energy into electric energy in a cell with positive and negative electrodes in an electrolyte. Technically two or more cells connected in series, but in common usage often applied to single cells..

battery (lead acid). A battery that uses lead as negative electrode lead dioxide as positive electrode and sulfuric acid as electrolyte; nominal voltage 2 volts per cell.

battery (nickel cadmium). A battery that uses nickel oxide for positive electrode and cadmium for negative electrode with an alkaline electrolyte; nominal voltage 1.2 volts per cell.

battery capacity A battery's ability to provide a specified current, for a given time period, to a specified end voltage. (ampere-hour rating)

battery cell failure. The condition existing when a cell will provide less than 80% of its original rated current capability as specified in the manufacturer's cell performance data sheet.

battery charger Equipment used to restore the charge in storage batteries.

battery rating (SAE lead acid). Ampere-hour rate, indicates the capacity of a battery. The fully charged battery is brought to a temperature of 80° F and is discharged at a rate equal to 1/20 of the published capacity in ampere-hours, until the voltage falls to 1.75 volts per cell.
See cold cranking amperes, and reserve capacity

battery warmer. Heater used in cold climates to maintain battery electrolyte temperature.

block heater. Coolant heating device which may be mounted in the engine block and immersed in engine coolant, (immersion type heater) or mounted externally and connected to the engine's coolant passages by means of piping or hoses (tank type heater).

blower fan. A fan positioned in a cooling system such that the air passes through the fan before entering the radiator.

bonding . A reliable connection to assure electrical conductivity (usually used in grounding circuits).

brake horsepower. The power available at the flywheel, or other output member(s) for doing useful work.

brake specific fuel consumption (B.S.F.C.). The rate of fuel consumed by an engine, divided by the flywheel power output. (Also referd to as Specific Fuel Consumption)

break-away current. The momentary current drawn by an electric motor to start rotation.

brush. A conductor, usually composed in part of carbon, serving to maintain an electric connection between stationary and rotating parts of an electrical machine.

brush holder. A structure that supports a brush and enables it to be maintained in contact with the rotating surface.

bus. A conductor, or group of conductors, that serve as a common connection for two or more circuits.

bypass oil filter: See partial flow filter.

bypass-isolation switch. A manually operated device used in conjunction with a transfer switch to provide a means of directly connecting load conductors to a power source and isolating the transfer switch to permit maintenance and testing of the transfer switch with no interruption to the load.

bypass switch. A specific device or combination of devices designed to bypass a control device.

capacitance. The property of any system of conductors and dielecteics or any device to store electrical potential energy. See capacitor. The unit of measure of capacitance is farads and its symbol is "C".

capacitor. A device consisting of two conducting surfaces separated by a dielectric material capable of storing electric energy.

central processing unit (CPU). The microchip containing the arithmetic logic unit, decoder, registers, etc., that interprets and executes machine-level commands inside a program logic controller (PLC).

charging rate. The current expressed in amperes at which a battery is charged.

circuit breaker. A mechanical switching device capable of making, carrying and breaking currents under normal circuit conditions and also making, carrying for a specific time, and automatically breaking currents under specified abnormal circuit conditions such as those of short circuit.

circuit breaker, magnetic trip. The portion of a circuit breaker mechanism that opens the circuit under specified abnormal current.

circiut breaker, thermal trip. The portion of a circuit breaker mechanism that opens the circuit under sustained overload but does not protect against short-circuit currents.

circuit breaker, thermal/magnetic trip. Thermal/magnetic trips employ a thermal bi-metallic element having an inverse time/current characteristic for protection against sustained overloads. In addition, the breaker contains an instantaneous magnetic trip element for short-circuit protection.

city-water cooling. Engine cooling derived from public utility water.

closed-cycle gas turbine engine. A closed cycle engine which has a working fluid independent of the atmosphere.

closed-transition switch. Transfer switch which provides a momentary paralleling of both power sources during a transfer in either direction. The closed transition is possible only when the sources are properly interfaced and synchronized.

cogeneration. A system that generates more than one form of useful energy at once, usually electricity and heat.

cold cranking amperes (CCA). A standard rating for lead acid batteries; established by BCI (Battery Council International). The Cold Cranking Ampere rating is the current, in amperes, that a battery will deliver for 30 seconds, at 0° F, before the battery terminal voltage drops to 1.2 volts per cell (7.2 volts for a 12 volt system, and 14.4 volts for a 24 volt system). lead -acid batteries are generally specified in terms of CCA and reserve capacity.

collector ring (slip ring). A metal ring suitably mounted on an electric machine that (through stationary brushes bearing thereon) conducts current into or out of the rotating member.

combination medium. A filter medium composed of two or more types, grades, or arrangements of filter media to provide properties which are not available in a single filter medium.

combustion air. The air that enters the engine and is mixed with fuel for the combustion process.

combustion chamber. That portion of an engine in which an air - fuel mixture is burned.

combustor. See combustion chamber That portion of a gas turbine where the air-fuel mixture is burned.

commercial power. A term applied to power furnished by an electric power utility.

compression ignition. Utilizes the heat caused by the compression of air to initiate the combustion process.

compression ratio. In a reciprocating engine, the ration of the cylinder volume at the bottom of the piston stroke to the volume at the top of the stroke.

conductor. A wire, cable or bus bar designed for the passage of electrical current.

connector. A coupling device employed to connect conductors of one circuit element with those of another circuit element.

constant potential charger. A battery charger in which the voltage at the output terminals of the charger is held to a constant value.

contactor. An electro-mechanical device for repeatedly establishing and interrupting an electrical circuit.

continuous power. Power recommended by the manufacturer for satisfactory operation under the manufacturer's specified continuous duty conditions. (Defined as operation with a constant, non-varying load.)

coolant. A fluid used to transport heat from one point to another.

coolant heater. A device used to heat the engine coolant.

cooling air. The air that is used to cool a heat producing component.

cooling system. A group of interrelated components to effect the transfer of heat.

cooling system capacity. The volume of coolant designated by the manufacturer to completely fill the cooling system.

copper loss (or line loss). That portion of the losses involved with the flow of electric current through the resistance of the conductors. These losses are proportional to the resistance and the square of the current and are referred to as I^2 R loss.

corrected power. In engine testing, the observed power adjusted to standard conditions.

critical silencer. An exhaust silencer that is applied in sensitive noise control areas.

Cross current compensation. A series differential connection of the various generator parallel current transformer secondaries which act to modify generator excitation so as to minimize its differential reactive current with the end result, that reactive load sharing among generators is obtained without voltage droop. Its effect on voltage is similar to that of parallel isochronous governors operation effect on speed or frequency. Also called reactive differential compensation.

current. The rate of flow of electricity. See ampere.

current limit. A control function that prevents a current from exceeding prescribed limits.

current transformer (CT). A transformer that produces a secondary current proportional to the primary current.

cycle. Any set of operations that is repeated regularly in the same sequence.

cycles per second (CPS). The number of times a cycle repeats in a second. See also frequency, hertz and alternating current.

D/A converter. A device that converts digital data to an analog signal such as an exciter field.

damper winding See amortisseur.

damping. A process of reducing oscillations.

day tank. A small fuel tank usually adjacent or in close proximity to the engine driven fuel pump which stores a ready fuel supply near the engine. Also called a transfer tank.

dc generator. An electric generator which transforms mechanical energy into direct current electric energy.

deaeration tank . A tank or other area of quiescent coolant flow which tends to remove entrained air and/or combustion gas from the circulating coolant.

deciBel (dB). One-tenth of a Bel. The number of deciBels denoting the ratio of the two amounts of power being ten times the logarithm to the base 10 of this ratio. A unit of measure of noise level in which the faintest sound we can hear, called the threshold of hearing, is 0 dB, and the loudest sound the human ear can tolerate, called the threshold of pain, is 140 dB.

delayed transition (also programmed transition). A timed load disconnected period during transfer between power sources, primarily to allow for the decay of motor residual voltage.

dew point. The temperature at which the water vapor contained in a gas begins to condense.

dielectric. Electrical insulator.

dielectric strength. The ability of insulation to withstand voltage without breaking down. Dielectric strength is usually expressed in volts per mil.

differential pressure indicator. A device which indicates continuously during operation the differential pressure across a filter element.

digital device (control equipment). A device that operates on the basis of discrete numerical techniques in which the variables are represented by coded pulses.

diode. A device which allows current to pass in one direction only. It may be used as a rectifying element.

direct current (dc). A non-varying, unidirectional electric current.

direct-axis subtransient reactance ($X"_d$). The ratio of the fundamental component of reactive armature voltage (due to the initial value of the fundamental direct-axis components of the alternating current component of the armature current) to this component of current under suddenly applied load conditions and at rated frequency. This allows the calculation of short circuit current of an AC generator.

direct-axis subtransient short-circuit time constant (T_a). The time in seconds required for the rapidly decreasing component present during the first few cycles in the direct-axis component of the alternating-current component of the armature current under suddenly applied short-circuit conditions, with the machine running at rated speed to decrease by 1/e or 0.368 of its initial value.

direct-axis synchronous reactance (X_d). The ratio of the fundamental component of reactive armature voltage, due to the fundamental direct-axis component of armature current, to this component of current under balanced steady-state conditions and at rated frequency.

direct-axis transient open-circuit time constant (T_{do}). The time in seconds required for the rms alternating-current value of the slowly decreasing component present in the direct-axis component of symmetrical armature voltage on open-circuit to decrease by 1/e or 0.368 of its initial value when the field winding is suddenly short-circuited with the machine running at rated speed.

direct-axis transient reactance (X'_d). The ratio of the fundamental component of reactive armature voltage, due to the fundamental direct-axis alternating-current component of the armature current, to this component of current under suddenly applied load conditions and at rated frequency, the value of current to be determined by the extrapolation of the envelope of the alternating-current component of the current wave to the instant of the sudden application of load, neglecting the high-decrement currents during the first few cycles.

displacement. The swept volume of an engine cylinder, referring to the volume displaced by the cyclic travel of the piston.

disposable element. A filter element which is removed from a permanent housing, discarded and replaced at the end of its service life.

disposable filter. A filter consisting of a filter element encased in a housing which is discarded and replaced in its entirety at the end of the service life of the element.

double-pole switch. A switch which opens or closes two isolated circuits simultaneously. It is actually two switches in one housing operated by a common handle.

double-throw switch. A switch which connects one circuit to either of two other isolated circuits.

drift temperature. A condition in which temperature changes cause a regulated value to deviate from the nominal value.

drift. A gradual change in output at constant load. Sometimes caused by a change in temperature.

dripproof. Construction of the frame air openings of an electrical machine to prevent liquid from entering these openings by gravity.

droop, engine speed. The difference between the speed of the engine, when rated load is applied, and the speed of the engine running at no load, with a fixed governor speed setting.

dual rate charger. Refers to an automatic battery charger that is capable of maintaining starting batteries at the nominal rate and then switching to a high charge rate to equalize the charge on the plates within the battery.

duplex filter. A dual filter system in which the filters are switchable. For example, if the filters are switched while the engine is running, the original filter can removed and replaced without interfering with normal engine operation.

ebullient cooling. A high temperature cooling system, usually above 230°Fahrenheit, in which the engine is cooled by the latent heat of vaporization as the coolant is boiled.

eddy current. Circulating currents in magnetic field conductive materials caused by alternating magnetic fields. They represent power losses in generators and transformers.

effective area. The area of a filter medium through which fluid flows.

efficiency. The ratio (expressed as a percentage) of the useful power output to the total power input.

egress lighting The illumination of the means of exit from a building or structure.

EGSA. Electrical Generating Systems Association - A non profit association of manufacturers, distributors, and users of on-site power generation equipment.

electric set (continuous power). An electric generating set which is operated for an unlimited number of hours per year, where there is a constant non- varying load, or a dedicated load.

electric set (peaking power plant). An electric generating set that assumes all or part of the load during peak-load periods. This is sometimes refered to as "limited running time power", and generally is operated for a defined time interval.

electric set (prime power). An electric generating set which is operated as the primary source of power. It may be primary because it is the sole source or because it provides a special type of power. (The load is considered to be a normal varying utility type load).

electric set (standby power). An electric power generating system which is on "standby alert," ready to assume the load when the normal power source fails. (The load is considered to be a normal varying utility type load).

electric utilitiy. An enterprise engaged in the production and/or distribution of electricity for use by the public.

electrical degree. One 360th part of a cycle of an alternating current or wave.

electrical starting system. Utilizes a series wound dc electric motor to crank the engine for starting. The dc power is usually supplied by a battery pack.

electro-magnetic field. An induced magnetic field generated by the passage of an electric current through a conductor (Commonly used in conjunction with a pole structure.)

electromotive force (EMF). The force which causes current to flow in a conductor; in other words, the voltage or potential.

element pressure differential. See filter pressure differential

emergency circuit. Building load circuit essential to life safety, separated from the normal circuits and operated separately only during emergencies.

emergency power (alternate source of power). An independent reserve source of electric energy which, upon failure of the normal source, provides electric power for safety to life circuits.

energy. Capability of performing work. Expressed electrically in kilowatt hours kWh.

engine charge air cooler. A heat exchanger used to cool the charge air of an internal combustion engine after it has been compressed by an exhaust driven turbocharger and/or mechanically driven blower. Engine charge air coolers are often referred to as either intercoolers or aftercoolers depending upon their location, relative to the final compression stage, in the air induction system.

engine rating. The value of engine power output assigned by the manufacturer, to indicate the maximum power level at which the engine should be applied in a given application.

engine safety controls. Devices that protect against catastrophic damage by shutting the engine down in the event of abnormal operating conditions.

engine speed. The rotating velocity of the engine flywheel, measured in revolutions per minute (rpm).

equalizing charge. An extended charge to a measured end point that is given to a storage battery to insure the complete restoration of the active materials in all the plates of all the cells. May be timed or automatic.

equipment grounding. The bonding of all exposed mettalic parts of electrical equipment to a grounding elecrode. This includes metalic parts such as generator frames, engines of engine generator sets, mounting bases, electrical condiut and enclosures.

excess fuel device. Any device provided for giving an increased fuel setting for starting only, generally designed to automatically restore action of the normal full load stop after starting.

excitation. The dc power supplied to the field coils of a synchronous generator, producing the magnetic flux required for inducing voltages in the opposing member.

exciter. A device for supplying excitation to the generator field. It may be a rotating dc, ac with rectifiers, or a static device converting ac to dc.

exciter ammeter. An ammeter connected to the output terminals of the exciter to indicate amount of excitation current.

exducer. The fluid exit portion of a turbine wheel.

exhaust emissions. The constituents of the waste gas that leaves the prime mover through its exhaust system.

exhaust waste heat recovery. A process which collects a portion of the heat from engine exhaust which would normally be dissipated.

exhaust waste heat recovery silencer. A device that is used to recover exhaust heat in the form of hot water or steam, and also provide sound attenuation.

exhaust system. The system that channels the products of combustion (exhaust gases) from the engine into the atmosphere.

fan air flow. The rate of air flow usually in units of cubic feet (cubic meters) per minute that a cooling fan can deliver at specified ambient air conditions, and a specified static pressure and fan speed.

feedback The process whereby a portion of the output signal of a system acts on the input signal to adjust the amplification factor of the system.

feedback (positive). In positive feedback, a portion of the output signal acts on the input of the system to increase the amplification.

feedback (negative). In negative feedback, a portion of the output signal acts on the input of the system to decrease the amplification.

field. A region of magnetic lines of flux. The field may be produced by electrical current or permanent magnet.

field coil. A suitably insulated electric winding to be mounted on a field pole.

field pole. The part of a magnetic structure of an electric machine on which the field coils are located.

filter. In engine systems, a device having a porous medium, whose primary function is the separation and retention of particular contaminants from a fluid. In electrical systems, a device used to reduce unwanted alternating currents.

filter capacity. The maximum amount of specified contaminant removed and held by a filter.

filter efficiency The ability, expressed as percent, of a filter to remove specified standard contaminant from a specified fluid under specified test conditions.

filter element. A sub-assembly of a filter which contains the filter medium or media.

filter housing. A ported enclosure which contains the filter element and directs fluid flow.

filter medium. The porous material which performs the process of particle separation and retention.

filter pressure differential. The drop in pressure due to flow across a filter or element. The term may be qualified by adding one of the words initial, final, or mean.

filter rated flow The maximum flow rate of a fluid of specified viscosity for which a filter is designed.

final filter. The last stage of a multi-stage filter system.

flexible exhaust connection. A flexible section in the exhaust system used to reduce stresses which can result from relative motion between the engine and fixed exhaust piping, or from thermal expansion and contraction.

flexible fuel line. A flexible section between the engine fuel inlet and the fuel supply or return lines. This flexible section is used to reduce stresses which can result from relative motion between the engine and supply lines.

float charger. Automatic battery charger that continually monitors battery voltage and maintains charge at a specified level.

flow rate, coolant. The rate of flow of coolant through a cooling system component or group of components under specified conditions.

flux. Magnetic lines of force.

flux density. Magnetic lines of force per unit of area.

four cycle engine (also four-stroke cycle). A reciprocating internal combustion engine that requires four piston strokes to complete a power cycle (intake, compression, combustion, and exhaust).

frame (rotating machinery). A stationary supporting structure.

frequency. The number of complete cycles of an alternating voltage or current per unit of time, expressed in hertz (Hz), cycles per second.

frequency band. The permissible variation from a mean value of frequency under steady state conditions.

frequency drift. A gradual deviation of the mean governed frequency above or below the desired frequency under a constant load.

frequency droop The change in frequency from steady state no-load operation to steady state full load operation.

frequency meter. An instrument that indicates frequency of the alternator output in hertz.

frequency recovery time. The time interval required for the frequency to return to and remain within a prescribed frequency band following a step load change.

frequency regulation. The percentage change in frequency from steady state no load (F_{nl}), to steady state full load (F_{fl}). Frequency regulation is determined by the following equation:

$$\%R = \frac{F_{nl}}{F_{fl}} \times 100$$

frequency transient. The frequency deviation resulting from a sudden change in load.

fuel heaters. A device used to heat fuel at cold ambient temperatures.

fuel injection tubing The high pressure tube connecting the injection pump to the nozzle holder assembly.

fuel injector. A device that introduces a metered quantity of fuel to the combustion chamber.

fuel lines. Tubes used to convey fuel to and from the engine.

fuel storage tank. A container used to store the fuel used by the prime mover.

fuel strainer (also primary filter). A coarse filter usually used in conjunction with gas lines and heavy fuels.

fuel stop. Limits the prime mover's maximum power output by limiting fuel.

fuel transfer pump. The device used to transfer fuel from the storage tank to the prime mover.

full flow filter. A filter through which all of the system's oil flows.

full load current. The greatest load that a circuit or device is designed to carry continuously at rated conditions. Also known as rated current.

fuse. An overcurrent protective device which consists of a conductor that melts and opens the circuit when current exceeds rated value for a predetermined time.

gas generator: See gasifier

gas producer See gasifier

gas turbine engine. A rotary prime mover which uses an essentially continuous process to compress, heat, and expand a gaseous working fluid.

gasifier. That part of the engine which supplies heated, pressurized gas to the power turbine.

generator. A machine for converting mechanical energy into electrical energy. The electrical energy may be direct current (dc) or alternating current (ac). See alternator.

generator saturation. The point at which an increase in excitation current produces little or no increase in generator voltage.

governor. A device that regulates prime mover speed by adjusting the fuel input to maintain constant speed.

governor, droop-type. A governor that regulates speed so that steady-state speed decreases slightly as load is added.

governor, digital. An electric governor controled by a digital signal system. This technique combined with the fuel injection system is effective in reducing exhaust emissions.

governor electric. A governor that senses prime mover speed by means of a magnetic pick-up or by sensing the frequency of the electric-set generator. The governor then uses an electrical controller to determine the correct fuel setting to maintain prime mover speed.

governor elecric load sensing. An electric governor that senses load as well as speed. Load is sensed by monitoring the electric-set generator output power.

governor, isochronous. A governor that can be adjusted to zero droop so that steady-state speed is the same at all loads.

governor, mechanical. Achieves prime mover speed control by balancing the force exerted by rotating flyweights against a spring force.

governor, hydraulic. A mechanical type governor which utilizes hydraulic boost to regulate the fuel input, thereby controlling engine speed.

governor, droop. The difference between engine speed at full load and at no load. Expressed as a percentage of no load speed.

governor regulation. The ability of a governor to hold the prime mover at a given preset speed, expressed as a percentage of the rated load speed.

graphical user interface (GUI). The graphical screen that represents computer disks, programs, documents, etc. with icons that can be manipulated through a mouse or other device.

grid power. Same as commercial power.

gross power. The total power produced by the prime mover before deducting parasitic losses.

ground. A connection, either intentional or accidental, between an electric circuit and the earth or some conducting body serving in place of the earth.

grounded neutral. A neutral point of an electrical system which is intentionally connected to ground.

grounding electrode. An effectively grounded structural member of the building, an effectively grounded metal water pipe or where not available other means as permitted in the National Electrical Code Article 250.

grounding, high resistance. Grounding the neutral of a system through a high resistance.

grounding, solidly. Solidly bonding a system to a grounding electrode. Usually applied to the neutral.

harmonic. Deviations from the fundamental frequency–which are a multiple of the generated frequency. They are expressed as second,third, fourth, fifth, etc. harmonics, denoting their frequency as a multiple of the fundamental frequency.

harmonic content. The harmonic content of a voltage waveform is a measure of the presence of harmonics in the wave form expressed as a percentage of the fundamental frequency at each harmonic. The total harmonic content is expressed as the square root of the sum of the squares of each of the harmonic amplitudes (expressed as percentage of the fundamental).

heat exchanger cooling. Engine coolant heat is dissipated to water through a liquid to liquid heat exchanger. (See also 'city water cooling' and 'raw water cooling')

heat sink. A medium which conducts heat away from electronic devices.

heavy duty air cleaner. An engine air cleaner with greater dust holding capacity for applications where operations will be in heavy dust concentration for sustained periods.

hertz (Hz). A unit of frequency(formerly cycles per second).

horsepower. A measure of engine power output, equivalent to 550 ft lbs/second.

hunting. The oscillation of voltage or frequency above and below the mean value. An unstable condition.

hydraulic starting system. A starting system that utilizes pressurized hydraulic fluid through a hydraulic motor for starting the prime mover.

impedance. The total opposition offered by a circuit to the flow of alternating current. It is composed of resistance and reactance (inductive and/or capacitive) and its symbol "Z" is expressed in ohms.

induced voltage. The voltage which is produced in a conductor due to change in the magnetic field surrounding it.

inductance. The property of an electric circuit that opposes any change in current flow. Inductance is expressed in henrys and its symbol is "L".

induction generator. An induction machine, when driven above synchronous speed by an external source of mechanical power, used to convert mechanical power to electric power.

industrial silencer. An exhaust muffler used to produce the silencing level normally associated within industrial areas.

inherent voltage droop. The decrease in voltage from no load to full load with excitation fixed at 100% volts no load.

inherent voltage regulation. The inherent voltage droop expressed as a percentage of full load voltage.

injection pump. The device which meters the fuel and delivers it under pressure to the injection nozzle.

in-phase monitor. A device that monitors the relative differance in phase angle between two power sources, and initiates transfer when acceptable relative levels of phase angle are present.

inrush current. The inrush current of a machine or apparatus is the maximum current which flows after being suddenly and fully energized.

insulation. A non-conductive material (See also dielectric).

insulation resistance. The resistance that an insulating material has to the passage of current to ground or to another conductor. It is usually measured in megohms (See also dielectric strength).

intercooler. A heat exchanger that reduces the temperature of combustion air after initial compression; also referred to as aftercooler.

IR drop. The voltage drop across a resistance. The IR drop is equal to the current in amperes multiplied by the resistance in ohms.

iron loss. That portion of generator losses involved in magnetic structures caused by the magnetization of the iron. It depends on the flux density, frequency, lamination thickness and chemical composition. These losses are composed of eddy current losses and hysteresis losses.

isochronous governor. A governor that maintains a constant engine speed from no load to full load.

keel cooling. Used in marine applications to dissipate engine coolant heat to the sea through a keel mounted heat exchanger.

kilovolt-amperes (kVA). 1,000 volt-amperes (apparent power). See VA.

kilovolt-amperes reactive (kvar). 1,000 volt-amps reactive (reactive power).

kilowatt (kW). 1,000 watts (real power). See watt.

kilowatt hour (kWh). Unit of electric energy. 1 kW x 1 hr = 1 kW h.

lagging power factor. The power factor caused by inductive loads, such as motors and transformers, in which the current lags behind the voltage in an alternating current network. See power factor.

line loss. See copper loss.

line to line voltage. The voltage existing between any two phase conductors in a polyphase circuit.

line to neutral voltage. The voltage existing between any phase conductor and the neutral conductor.

liquid cooled engine. An engine that is cooled by means of liquid coolant circulated about the heated parts of the engine. The coolant is then passed through a radiator or heat exchanger where it in turn is cooled and then re-circulated to the engine.

load factor. The ratio of the average load imposed on the prime mover to the prime mover's load rating.

megohmmeter. A high resistance range ohmmeter utilizing a power source for measuring insulation resistance.

megohm. A unit of resistance equal to one million ohms.

National Electrical Code (**N.E.C.)** is the National Fire Protection Association standard NFPA 70 for electric wiring and apparatus.

National Electrical Manufacturers Association (NEMA)., a nonprofit trade association supported by the manufacturers of electrical apparatus and supplies. NEMA is engaged in standardization to facilitate understanding between the manufacturers and users of electrical products.

National Fire Protection Association (NFPA). A non-profit organization for the development of fire and safety standards.

microprocessor. A solid state device built onto a single silicon chip capable of being programmed to perform a large number of tasks. It is usually the central processing unit of computers, programmable logic controls and other control systems.

microturbine. A gas turbine in the range of 25-250 kW output. The development of power electronics has spurred the development of small high speed single shaft gas turbine-generators.

naturally aspirated. Engine combustion air flow is not assisted by artificial means such as a supercharger or turbocharger.

negative sequence reactance (X_2). The ratio of the fundamental reactive component of negative-sequence armature voltage, resulting from the presence of fundamental negative-sequence armature current at rated frequency.

net power. The usable power output of an engine. (Gross power less any parasitic loads). In describing a generator set, the net electrical power available.

neutral. The point in a polyphase system where the voltages to all phases are equal.

no-break power. See uninterruptable power supply (UPS).

nominal value. A reference value selected to establish equipment ratings.

light duty air cleaner. An air filter with relatively little dust holding capacity.

nozzle. The assembly of parts employed to atomize and deliver fuel to the engine.

nozzle and holder assembly. The complete apparatus which injects the pressurized fuel into the combustion chamber.

observed power. Power actually developed by an engine under the ambient conditions existing during the test.

ohm. Unit of electrical resistance. One volt will cause a current of one ampere to flow through a resistance of one ohm.

ohmmeter. A device for measuring electrical resistance.

oil immersion heater. Device used to heat the engine lubricating oil by means of a heating element immersed in the oil.

open cycle gas turbine engine. A gas turbine engine in which the working fluid enters the engine from the atmosphere and is discharged to the atmosphere.

open-circuit voltage. The voltage existing when no load is attached to the power source.

operation selector switch. A multiposition switch which can be set to the selected mode of operation. The selected modes are usually automatic, test, manual operation and off.

out-of-phase. A condition in which AC voltage waves of two generating systems do not coincide.

overheating. An operating condition where coolant temperature exceeds design intent. This may be caused by a deficiency in the cooling system or by abnormal operating conditions.

overload power. Overload power is that load in excess of rated load which the generator set is capable of delivering for a specified period of time. It should be recognized that the voltage, frequency and operating temperature may differ from normal rated values.

overshoot. The amount by which voltage or frequency exceeds the nominal value after a sudden load change.

overspeed governor. A mechanical, or electrical, speed-sensitive device that through mechanical or electrical action acts to cause a shut down of the engine or limit the speed by cutting off fuel and/or air supply should the engine speed exceed a preset maximum.

parallel connection. An electrical connection in which the input terminal of one element is connected to the input terminal of another element and the output terminals are similarly connected together, thereby providing two paths for current flow.

parallel operation. Two or more generators, or other power sources, of the same phase, voltage and frequency characteristics supplying the same load.

paralleling. The procedure used to connect two or more generators to a common load.

parasitic load. The extra load caused by accessories such as the cooling system fan and battery-charging alternator.

partial flow filter (bypass filter). A filter which filters only a part of the total system flow.

peak shaving. Process by which utility customer minimizes utility charges by either generating power and eliminating excessive demand charges or by shedding load.

permanent magnet (PM). A ferromagnetic body that maintains a magnetic field without the aid of external electric current. The most practical material types are alnico, ceramic and rare earth.

permanent magnet generator (PMG). A generator that has a permanent magnet field, usually rotating. The generator is usually synchronous.

phase. The winding of a generator that determines the number of complete voltage and/or current sine waves generated per 360 electrical degrees, as in three phase.

phase balance. The amount of voltage difference between phase voltages under balanced load conditions.

phase imbalance with unbalanced loads. The reflection of voltage unbalance between phase voltages when one phase is loaded to a specified level and the other two phases are unloaded.

phase rotation. The sequence in which the phases of a generator or network pass through the positive maximum points of their waves. Typically 1-2-3 or 3-2-1. (Sometimes referred to as ABC or CBA)

pilot exciter. A small generator, usually permanent magnet field, used to power the field of the main exciter. See permanent magnet generator.

piston speed. The piston speed of an engine is the total feet of travel made by each piston in one minute. Formula is:

Piston Speed = stroke in feet x rpm x 2.

pole, magnetic. A part of a magnetic structure, there being two such parts, called a north pole and a south pole. Since neither pole can exist without the corresponding opposite, they always are present in pairs. Hence, a generator always has an even number of poles.

polyphase. A system in which there are multiple separate complete voltage and current sine waves, each of 360 electrical degrees. For example, three phase is three complete separate sine waves spaced 120 electrical degrees apart.

portable generator set. Any wheel, skid, truck or railroad car mounted, but not self-propelled, equipment designed to supply electric power.

Potier reactance (Xp). A synchronous machine quantity determined from a no-load saturation curve, and a zero power factor excitation. It is useful for the calculation of excitation of the machine at other loads and power factors. The height of a Potier reactance triangle determines the reactance drop, and the reactance Xp is equal to the reactance drop divided by the current.

power. Rate of expending energy per unit of time. Mechanical power can be measured in horsepower; electrical power in kilowatts. One horsepower equals 746 watts.

power factor (also cos θ). In AC circuits, the inductances and capacitances may cause the point at which the voltage wave passes through zero to differ from the point at which the current wave passes through zero. When the current wave precedes the voltage wave, a leading power factor results, as in the case of a

capacitive load or over-excited synchronous motors. When the voltage wave precedes the current wave, a lagging power factor results. The power factor expresses the extent to which voltage zero differs from the current zero. Considering one full cycle to be 360 electrical degrees, the difference between the zero points can then be expressed as an angle, θ. Power factor is calculated as the cosine of θ between zero points and expressed as a decimal fraction (0.8) or as a percentage (80%). It can also be shown to be the ratio of kW, divided by the kVA. In other words, kW = kVA × P.F.

power factor meter. An instrument that measures the power factor of the system.

pre-alarm. Warning prior to actually actuating the automatic engine safeties to indicate impending shutdown.

pre-cooler. A heat exchanger that reduces the temperature of the working fluid before initial compression.

pre-lube. An auxiliary to the standard lube oil pump which provides lubrication to the engine prior to starting.

pressure reducing valve (gas). Valve used to reduce gas line pressure to usable limits of the gas carburetor. (Also referred to as a 'pressure regulator')

pressure reducing valve (water). Valve used to reduce water pressure between the main and the engine-cooling system.

primary filter. The first stage of a multi-stage filter system.

program logic controller (PLC). A solid state device capable of storing instructions to implement control functions such as sequencing, timing, counting and data manipulation to control machines and processes.

protected power circuit. Critical load circuit that is separated from the remainder of the normal load and protected by the emergency power system (standby power system). See emergency circuit.

protective relay. A device used to detect defective or dangerous conditions and initiate suitable switching or give warning. The IEEE asigns device numbers to various types of protective relays. A list of those used in the on-site power industry appears in Section 8.3.2 of EGSA reference book On-Site Power Generation.

pyrometer. An instrument used to measure gas temperatures.

radiator. A heat exchanger that is used to transfer engine coolant heat to the atmosphere.

rated current. The rated nameplate current of a machine or apparatus is the value of current which it can carry without exceeding the allowable temperature rises.

rated power. Horsepower specified by the engine manufacturer for a given application at a given (rated) speed. Also, the stated or nameplate net electric output which is obtainable from a generator set when it is functioning at rated conditions.

rated speed. Engine speed in revolutions per minute (RPM) at which the engine is designed to operate.

rated voltage. The voltage of electrical apparatus at which it is designed to operated.

raw water cooling. A liquid to liquid cooling system. The source of cooling liquid can be sea water, a lake or cooling pond, or city utility water. See city-water cooling, heat exchanger cooling.

reactive current. The component of a current in quadrature with the voltage.

reactive differential compensation. A series differential connection of the various generator parallel current transformer secondaries which act to modify generator excitation so as to minimize its differential reactive current with the end result, that reactive load sharing among generators is obtained without voltage droop. Its effect on voltage is similar to that of parallel isochronous governors operation effect on speed or frequency. (Also referred to as cross current compensation)

reactive droop compensation. A voltage regulator circuit that acts to affect generator excitation so as to create a droop in generator voltage proportional to the inductive reactive current. This characteristic is used to obtain reactive load sharing among generators operating in parallel. Its effect on voltage is similar to the effect that a droop type governor has on speed or frequency.

reactive load (var) sharing. The process of regulating excitation which causes the reactive load to be shared proportionally between generator sets.

reactive volt-ampere meter. Measures the reactive power furnished by the generator when the load power factor is less than unity.

real (active) load (watts) sharing. The process of governing which causes the real load to be shared proportionally between generator sets.

rectifier. A device which changes alternating current into direct current.

recuperator. A heat exchanger in which energy is transmitted from a flowing hot fluid to a flowing cold fluid through a wall whose function is to separate the two fluids.

regenerative cycle gas turbine engine. A gas turbine engine employing exhaust heat recovery in the thermodynamic cycle consisting of successive compression, regenerative heating, combustion, expansion, and regenerative cooling (heat transferred to compressor discharge air) of the working fluid.

regenerator. A heat exchanger in which energy is transmitted from a flowing hot fluid to a flowing cold fluid by alternately passing these fluids through the same mass of material.

reheat. Combustion subsequent to expansion.

relay. An electrical magnetic switch employing an armature to open or close contacts.

remote radiator. Radiator and fan that is mounted at some distance from the engine. The fan is generally not directly driven by the engine.

reserve capacity (RC). A standard rating for lead acid batteries; established by BCI (Battery Council International). The Reserve Capacity is the time in minutes that a given battery can be discharged at a constant rate of 25 amperes, at a temperature of 80° F before the battery terminal voltage falls to 1.75

volts per cell (10.5 volts for a 12 volt system, 21 volts for a 24 volt system). Batteries are generally specified in terms of CCA and Reserve Capacity. See also cold cranking amperes.

residential silenser. An exhaust muffler used to produce the silencing level usually associated with residential areas.

resistance (R). The non-reactive opposition which a device or material offers to the flow of direct or alternating current.

rolling current. The steady state current drawn by the engine cranking motor while it is cranking the engine.

silicon controlled rectifier (SCR) . An alternate name for a reverse blocking triode thyristor.

secondary filter. The second stage of a multi-stage filter system.

selective catalytic reduction (SCR). An NO_x reduction technology that utilizes the introduction of a reducing agent into the exhaust before the exhaust passes over a catalyzed bed.

short circuit current The current magnitude at the output terminals, when the terminals are connected together.

single shaft turbine engine. A gas turbine engine in which the compressor and turbine are mechanically coupled to the same shaft, and mechanically connected to the power output shaft either directly or through gearing.

skin enclosure. Weatherproof enclosure that is minimal and usually follows contour of equipment being protected.

sound attenuation. Reduction of sound level.

spark arrestor. A device used to prevent sparks from being released with exhaust gases.

specific fuel consumption. The amount of fuel consumed to produce a unit of work, usually expressed in pounds per horsepower or kilowatt hours, or grams per kilowatt hour.

specific heat rejection. The heat rejection of the engine expressed essentially in British Thermal Units per minute per horsepower.

spin-on filter. A disposable filter which mates to a permanent base and is attached by turning onto a threaded base stud.

standby power supply. The power supply that is selected to furnish electric energy when the normal power supply is not available.

starting system. A group of components that is used to initially rotate the prime mover at a sufficient speed to start the combustion process.

station battery. A power supply utilized for control of switchgear.

static transfer switch. A transfer switch using solid state components as the switching elements.

stator (rotating machinery). The stationary portions of the magnetic circuit and the associated windings and leads.

stator winding (rotating machinery). A winding on the stator of a rotating machine. See stator.

steady state. The operating conditions under constant load.

steady state frequency The governed frequency occurring when an engine generator is operating with a steady state electrical load.

steady state speed. The mean governed speed occurring when an engine generator is operating with a steady state electrical load.

steady state voltage The value of output voltage when the set is operating at a steady state load. See steady state.

suction fan. A fan positioned in a cooling system so that air passes through the radiator before entering the fan.

supercharged gas turbine engine. A gas turbine engine containing two mechanically independent rotors, each containing a driving turbine; one compressor operating with an air inlet at atmospheric pressure, which supercharges the second compressor inlet to a higher pressure. Useful power may be taken from either of the rotors, or from a free power turbine.

supply pump A pump for transferring the fuel from the tank and delivering it to the engine fuel system. (Also referred to as a 'Fuel Transfer Pump')

surge. A sudden temporary variation in current, voltage or frequency.

surge tankA separate tank in the cooling system provided to perform one or more of the following functions; (1) filling, (2) coolant reservoir, (3) de-aeration, (4) retention of coolant expelled from radiator by expansion and/or after boil, and (5) visible fluid level indication.

synchronism (rotating machinery). The state where connected alternating current systems, machines or a combination operate at the same frequency and where the phase angle displacements between voltages in them are constant.

synchronizer, automatic. A device which will synchronize an on-coming electric set with the bus or another electric set and will automatically close the circuit breaker which connects the multiple power sources in parallel.

synchronous generator. A synchronous alternating-current machine that transforms mechanical power into electric power. NOTES: (1) A synchronous machine is one in which the speed of normal operation is exactly proportional to the frequency of the system to which it is connected. (2) Unless otherwise stated, it is generally understood that a synchronous generator (or motor) has field poles excited with direct current or permanent magnets.

synchroscope. An instrument that provides a visual indication of proper time for closing the switch when synchronizing generators are connected in parallel to the load.

system air flow restriction. The static pressure differential which occurs at a given air flow from air entrance through air exit in a system, generally measured in inches (millimeters) of water.

system grounding. Pertains to the nature and location of an intentional interconnection between the electric system conductors and grounding electrode systems that provide an effective connection to ground.

tachometer. An electrical or mechanical device for measuring rotative speed usually expressed in rpm (revolutions per minute).

tap. A connection made at some intermediate point in a winding, coil or resistor.

telephone influence factor (TIF). The telephone influence factor of a synchronous generator is a measure of the possible effect of harmonics in the generator voltage wave on telephone circuits. (It is the ratio of the square root of the sum of the squares of the weighted root-mean-square values of all the sine wave components (including in alternating-current waves both fundamental and harmonics) to the root-mean-square value (unweighted) of the entire wave.
Note: This factor was formerly known as telephone interference factor, which term is still used occasionally when referring to values based on the original (1919) weighing curve.

terminal. A device attached to a conductor to facilitate a connection.

thermo-regulating valve. Heat actuated valve that limits amount of city or raw cooling water into the system to conserve water and regulate cooling.

thermocouple. A device for measuring temperature. It consists of a connection between two wires of dissimilar material which generates a small voltage proportional to the temperature of the ambient.

thermostat. A device that is heat actuated to maintain the circulating water temperature at a pre-determined level.

time constant (electrical). The time required to change from one condition to another, usually the time to complete 63.2% of the total rise or decay.

torque. Force required to move a shaft around its axis, measured in foot pounds.

torsional analysis. An evaluation, by calculation, to determine the level of engine crankshaft or generator shaft stress caused by torsional vibration and to compare the stress with the manufacturer's design limit.

torsional vibration. A twisting vibration which occurs in rotating machinery that contains two or more masses having significant moments of inertia interconnected by shafting having significant elasticity.

total energy. Refers to process whereby independent user generates on-site power and utilizes exhaust heat, and jacket water heat in addition to electricity generated.

tractor-driven generator An electric generator so constructed that its rotor is driven by a power take off (PTO) on a farm tractor.

transfer switch, contactor type. A throw-over switch having arc protected contact or contactors arranged to form a transfer circuit.

transfer switch. A switch designed so that it will disconnect the load from one power source and reconnect it to another source. Both automatic and manual transfer switches are available. (See also automatic transfer switch.)

transformer, potential. An instrument transformer used to supply voltage to protective relays or metering.

transformer. A static electric device consisting of a winding, or two or more magnetically coupled windings used to transfer power by electromagnetic induction between circuits at the same frequency, usually with changed values of voltage and current.

transient. That part of the change in a variable that disappears after transition from one steady-state operating condition to another.

trickle charger. a minimal charging device to maintain starting batteries charged at a continual fixed rate.

turbine. That component of the engine which produces torque from expansion of the working fluid. Consists usually of a turbine nozzle and a turbine wheel which together constitute a turbine stage. A multi-stage turbine comprises more than one turbine stage.

turbine nozzle. An arrangement of stationary blades for directing the flow of gas into a turbine wheel.

turbine wheel. The rotary component of the turbine stage which consists of a series of blades or buckets through which the fluid flows. May be of the axial, radial, or mixed flow type.

turbocharger. An air pump driven by engine exhaust gases and used to supply engine charge air-and pressures above atmospheric.

two-stroke cycle engine (also called two cycle). A recprocating internal combustion engine utilizing two piston strokes to complete the power cycle.

two spool engine. See supercharged gas turbine engine.

two stage element. A filter element assembly composed of two filter media in series. Generally, the first stage media is designed to remove larger particles, then the second stage removes smaller particles.

two shaft free power turbine engine. A gas turbine engine in which the compressor and its driving turbine are mounted on one shaft and the output power turbine is mounted on a separate shaft supplying useful power.

unidirectional current - A current which flows in one direction only. Also called direct current (dc).

uninterruptable power supply (UPS). A power supply which provides a continuous source of electric power when the normal source is interrupted, without any voltage or frequency disturbance.

unity power factor. A power factor of 1.0, characteristic of a resistive load.

utility power. The same as commercial power.

VA. volt-amperes (See kVA).

varmeter. A device for measuring reactive power of the circuit in which it is connected. (See kvar.)

voltage. The difference of electrical potential between any two conductors.

voltage dip. The reduction in voltage resulting from a sudden application of load, usually expressed as a percentage.

voltage drift. A gradual deviation of the mean regulated voltage above or below the desired voltage under constant operating conditions.

voltage droop. See voltage regulation and reactive droop compensation.

voltage operating band. The range of voltage through which the generator can be adjusted and operated. Example: 227/480 + 5%.

voltage range. The span of voltage through which the generator set is capable of being connected.

voltage recovery time. The time required for the voltage to return to and remain within a predetermined band after a transient.

voltage regulation. The voltage regulation of an engine generator set is the difference between steady state no load and steady state full load output voltage expressed as a percentage of the full load voltage.

voltage regulator. A device which automatically controls the voltage output of a generator at its specific value.

voltage transient. The maximum change in voltage when a specified load is suddenly applied or removed.

voltmeter. An instrument for measuring voltage.

watt. The electrical power required to do work at the rate of 1 joule per second.

watthour . Unit of electrical energy equal to one watt of power consumed during an hour. (1 watt-hour = 3600 joules).

watthour meter. An indicating instrument that displays the kilowatt-hour output continuously for record purposes.

wattmeter. An instrument that measures real power of the circuit in which it is connected. (See kW).

waveform The geometrical shape as obtained by displaying a characteristic of the wave as a function of some variable, usually time.

winding. (rotating machinery) An assembly of coils that acts to produce a magnetic flux field or to link a flux field.

wiring harness. A pre-assembled group of wires arranged to facilitate interconnection of electrical circuits.

withstand current. The maximum fault current that a device will withstand for a specified period of time without damage. Withstand current is not to be cofused with the rating of a current limiting device used to limit the maximum fault current.

wye connection. (same as star connection) A method of interconnecting the phases of a three phase system to form a configuration resembling the letter Y, such that one end of each of the windings is connected to a common point (the neutral point) and the other end to its appropriate line terminal.

zero-sequence reactance. The ratio of the fundamental component of reactive armature voltage, due to the fundamental zero-sequence component of armature current, to the component at rated frequency.

APPENDIX A
Glossary of Common Acronyms as used in Emissions Standards

CARB	California Air Resources Board
CAAA	Clean Air Act Ammendment
CI	Compression Ignition
CFC	Chloroflorocarbons
CO	Carbon Monoxide Emissions
DF	Deterioration Factor
EPA	Environmental Protection Agency
g/hp-hr	Grams per Brake Horsepower Hour
g/kW-hr	Grams per killoWatt Hour
GVWR	Gross Vehicle Weight Rating
HC	Total Hydrocarbon Emissions
HCHO	Formaldehyde
ILEV	Inherently Low Emissions Vehicle
LEV	Low Emissions Vehicle
M.Y.	Model Year
NMHC	Non Methane Hydrocarbons
NPRM	Notice of Proposed Rule Making
NOx	Total Nitrogen Oxide Emissions
OBD	On Board Diagnostic
PM	Particulate Matter
PPM	Parts per Million
SCAQMD	South Coast Air Quality Management District
SEA	Selective Enforcement Audit
SO_2	Sulfur Di Oxide
ULEV	Ultra Low Emission Vehicle
VOC	Volitile Organic Compounds