GLOSSARY

Abrasion - Flex - Fabric weakness created by repeated fiber bending.

Abrasion Resistance - Ability of a fiber or fabric to withstand surface wear.

Abrasion - Surface - Fabric wear on the surface created by particulate erosion, rubbing or scuffing.

Absorption - The operation in which one or more soluble components of a gas mixture are dissolved in a liquid.

ACFM - Actual cubic feet of gas per minute. The volume of the gas flowing per minute at the operating temperature, pressure and composition. *Note - in the metric system, the corresponding value may be expressed in actual cubic meters per hour, ACM (H).

Acid Deposition - The process by which acidic particles, gases, and precipitation leave the atmosphere. More commonly referred to as acid rain, acid deposition has two components: wet and dry deposition.

Acid dew point - The temperature at which combustion gases are saturated with sulfuric acid.

Acid rain - The result of sulfur dioxide (SO_2) and nitrogen oxides (NOx) reacting in the atmosphere with water and returning to earth as rain, fog, or snow. Broadly used to include both wet and dry deposition.

Additive - Substance added to a liquid or gas stream to cause a chemical or physical reaction to enhance SO_2 sorption.

Adipic Acid - An organic acid used as a performance enhancing chemical in absorber towers.

Adsorption - The operation in which a solid substance retains on its surface a layer of gaseous or liquid substance by which gas molecules are selectively removed from a gas stream.

A/E - Architect / Engineer

Air Heater - A heat exchanger, which transfers heat otherwise wasted from the flue gases to the incoming furnace air. It may be regenerative (Ljungstrom or Rothemuhle) or direct (tubular) air heaters may also be heated with fuel (direct fired) or steam.

Air, Standard - Dry air at 70 degrees F and 29.92 in Hg pressure. Equivalent to 0.075 lb/ft3

Air-To-Cloth (A/C) Ratio - The ratio between ACFM, flowing through a filter, and the square feet of filter area available. This can also be thought of as the velocity of the gas passing through the filter area in feet per minute (FPM). The typical A/C ratios for various types of cleaning systems are:

- Cleaning System A/C Ratio*
- Shaker 2.5 - 3.0 to 1
- Reverse Air 2.0 - 2.5 to 1
- Pulse-Jet 5 - 6 to 1
- Plenum Pulse 3.5 - 4 to 1

* NOTE: The term usually used in the metric system is filtration velocity instead of air-to-cloth ratio, defined as the relation between the cubic meters per min of air flowing through a filter and the square meters of filter area available. The typical filtration velocities are:

- Cleaning System Filtration Velocity
- Shaker 0.76 - 0.91 m3/m2/min
- Reverse Air 0.61 - 0.76 m3/m2 min
- Pulse-Jet 1.52 - 1.83 m3/m2/min
- Plenum Pulse 1.07 - 1.22 m3/m2/min

Alignment - Refers to how well optimum clearances are maintained between the high voltage discharge electrode system and the grounded collecting plate surfaces. Uniform corona current distribution, maximum use of installed plate area, highest possible operating voltages and best precipitator performance occur when proper discharge electrodes are everywhere centered within collecting plate gas passages or ducts. Reasonable maximum tolerances are considered +1/4 (+ or - 6 mm) off center for discharge electrodes and +1/4" (+ or - 6 mm) from flat for collecting plate surfaces. Clearance from corona source to vertical projecting plate baffles or edges should be a least 0.75 duct width. The sharper the edge or projection on the collecting surface anode, the greater the clearance to discharge corona. Good alignment depends upon good and reliable overall system mechanical integrity without thermal distortions. High voltage discharge elements and frame must be held plumb with respect to vertical collecting plate surfaces. Uneven foundation settling cannot be tolerated.

Allowance - A tradeable permit to emit a specific amount of a pollutant. For example, under the Acid Rain Program, one allowance permits the emissions of one ton of sulfur dioxide (SO_2).

Ammonia Injection Grid (AIG) - is a device that consists of multiple pipes with adjusting valves used in conjunction with nozzles, static mixers or delta wings to spread a mixture of ammonia and dilution air evenly across the cross section of the SCR inlet duct.

Ammonia Slip - This is the ammonia that is not consumed reacting with NOX and exits the NOX removal process.

Ammonium Bisulfate - A common side reaction of concern in SCRs.. At relatively cool temperatures, within and downstream of the air preheater, ammonium bisulfate can form from the reaction of residual ammonia (ammonia slip) and SO3 where the SO3 level is comparable to or higher than the ammonia slip level.

Ammonium Carbamate - This is an intermediate reaction product as urea decomposes into ammonia.

Ammonium Sulfate - Another common side reaction of concern in SCRs.. At relatively cool temperatures, within and downstream of the air preheater, ammonium sulfate can form from the reaction of residual ammonia (ammonia slip) and SO3 where the SO3 level is lower than the ammonia slip level.

Anemometer - A device for measuring small air velocities. See hot-wire anemometer and rotating vane anemometer.

Anhydrous Ammonia - This is the most concentrated form of ammonia. It is a gas at ambient pressure and can become a liquid when compressed. It absorbs readily into water. Therefore, contact of ammonia with eyes or mucous membranes can cause severe irritation and burning of these tissues. A full faced respirator with ammonia cartridges or a self contained breathing apparatus should be worn if one will be exposed to gaseous ammonia.

Anode - Positive electrical terminal of high voltage power supply; this is the collecting plate surface, which is maintained at ground potential. Precipitator (ESP) sparking starts at the anode.

Anti-Sneak Baffles - A gas distribution device in which, internal baffle elements within the precipitator prevent the gas from bypassing the active field or causing hopper re-entrainment.

Anti-Sway Insulator - Ceramic insulators used to prevent the bottom guide frame for the discharge wire tensioning weights from swinging and causing periodic misalignment of discharge electrodes resulting in premature sparking, poor precipitator performance. Two types in common use with two-point, high-tension (HT) frame support design: (1) vertical shaft 36" long supported off hopper walls; (2) horizontally mounted ceramic, positioning bars between bottom guide frame and precipitator outer steel shell. In some cases, teflon is used instead of ceramics.

Anthracite - A hard, black lustrous coal, often referred to as hard coal, containing a high percentage of fixed carbon and a low percentage of fixed volatile matter. Anthracite contains approximately 22 million to 28 million Btu per ton.

Apex - The tip, point, vertex; the narrowest point at the bottom of a hydroclone or thickener.

Aqueous Ammonia - In this form, concentrated ammonia has been dissolved in water. The concentration is expressed as what percentage of the liquid is ammonia. The higher the concentration, the more chance there will be of ammonia fumes being present in the air. Very low concentrations of aqueous ammonia are sold as a household cleaning product. Some localities have required the use of aqueous ammonia instead of anhydrous ammonia due to its lower health and safety hazards.

AR - Aspect ratio; ratio of ESP total collecting plate length to plate height.

Arc - A relatively long, large discharge of high voltage, which is not immediately self-extinguishing.

Ash - Impurities consisting of silica, iron, alumina, and other noncombustible matter that are contained in coal. Ash content is measured as a percent by weight of coal on an "as received" or a "dry" (moisture-free, usually part of a laboratory analysis) basis.

Aspect Ratio - The length of a precipitator divided by its height. The aspect ratio normally ranges from approximately 0.5 to 1.5 and affects the amount rapping re-entrainment contributes to the outlet burden.

ASTM - American Society for Testing Material

Automatic Power Supply Control - The automatic regulation of high voltage power for changes in precipitator operating conditions using feedback signal(s).

Auxiliary Control Equipment - The electrical components required to protect, monitor and control the operation of precipitator rappers, heaters and other associated equipment.

AVC - Automatic Voltage Control is an electrical or electro mechanical system to regulate the precipitator voltage requirements because of changes in operating conditions.

Back Corona - A localized corona discharge, which occurs when the gas within a high resistivity dust on the collecting surface breaks down and becomes ionized. Back corona starts at a critical bulk dust resistivity, e.g. = 1.0E+10 ohm cm. In the incipient early stages it causes ESP sparking at reduced voltages and current densities; severe back corona (5.0E+11 - 5.0E+12 ohm) causes heavy positive ion back current, greatly reduces particle charge and destroys the ESP particle collection process.

BACT - Best Available Control Technology

Baffle - A device, usually consisting of a plate or series of plates, which evenly distributes airflow and dust within a dust collector to protect filter bags from direct abrasion by dust.

Baghouse - An air filtration structure utilizing filter fabrics for the purpose of removing solid particulate from direct abrasion by dust.

Balanced draft - The condition where the absolute pressure in the boiler furnace is exactly equal to the absolute atmospheric pressure outside the furnace or is slightly negative.

Ball Mill - Equipment used for pulverizing limestone as well as for slaking of lime. It consists of a rotating cylindrical or conical casing charged with metal balls or slugs along with water and the material to be pulverized or slaked.

Batch cleaned - Usually refers to that process used in heat-cleaning glass cloth in roll form by exposing it to 500 degrees F - 600 degrees F temperatures for prolonged periods to burn off the starches.

BDAT - Best Demonstrated Available or Achievable Technology

Bituminous Coal - The most common coal. It is dense and black (often with well-defined bands of bright and dull material). Its moisture content usually is less than 20 percent. It is used for generating electricity, making coke, and space heating. The contents of bituminous coal range from 19 million to 30 million Btu per ton.

Bleedthrough - Particulate migration through the interstices of a woven filter bag fabric or through the needled fibers of a felt bag.

Blinding - Fabric blockage by dust, fume or liquid not being discharged by the cleaning mechanism, resulting in reduced gas flow or increased pressure drop across the media.

Blowpipe - Pipe connected to the pneumatic pulsing system with holes to distribute cleaning air to bag rows in pulse-jet units.

Boiler - A device that generates steam for power. Heat from an external combustion source is transmitted to a fluid contained within the tubes in the boiler shell. This fluid is delivered at a desired pressure, temperature and quality.

Breeching - The rectangular opening in a chimney wall where a duct enters the chimney.

Bridging - The blockage of a hopper by the formation of an arch or "bridge" of compacted dust over the hopper exit.

Btu (British Thermal Unit) - A standard unit for measuring the quantity of heat energy equal to the quantity of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit.

Buffering - When a substance in solution has the ability to react with and neutralize large amounts of acid, thus preventing the pH from changing substantially with small additions of acid.

Bulked yarn - Filament yarn that has been processed by high-pressure air passing through the yarn and relaxing it into gentle loops, bends, etc.

Bursting Strength - General: A material's ability to resist rupture by pressure. Specific: Force required to rupture a fabric by distending it with the force applied at right angles to the fabric plane under specified conditions. Usually expressed in pounds per square inch. (kg/cm2)

Bus - A conductor enclosed within a grounded duct.

Bus Section - The smallest size high voltage assembly of discharge electrodes and minimum collecting plate area that can be independently energized by one electrical set; or one electrical output.

By-product - Saleable or usable product that has some economic value.

Cake - The dust formation developed on the surface of the filter medium during the filtration process or the layer of solids left on a filter cloth once the liquid has been drawn out of a slurry using vacuum.

Calcination - To change or burn to a powder using heat, such as changing limestone into lime in a kiln.

Calendaring - High pressure pressing of the fabric; pushes the surface fibers down onto the body of the filter medium.

Can Velocity - In a dust collector with the filter elements suspended from the tubesheet, can velocity is the upward air stream speed passing between the filters calculated at the horizontal cross-sectional plane of the collector housing at the bottom of the filters. Example:

- Air volume: 18,850 ACFM (8.9 m3/hr)
- Total cross-sectional area of collector: 15 ft x 8 ft = 120 ft2 (4.57 m x 2.43 m = 11 m2)
- Total area of filter bottoms: 20 x 12 = 240 filters at 28.27 in2/filter (0.018 m2/filter) = 47 ft2 total (4.37 m2 total)

- Open area between filters: 120 ft2 (11.2 m2) - 47 ft2 (4.37 m2) = 73 ft2 (6.64 m2)
- Can velocity: 18,850 ACFM / 73 ft2 (6.78 m2) = 258 FPM (1.31 m/sec)

Catalyst - A catalyst is a chemical substance that is used in SCRs to promote the conversion of NO and NO_2 to N_2, but the catalyst is not used up during the chemical reaction. There are three main types of catalysts:

- Plate
- Corrugated
- Honeycomb

Catalyst Pitch - When looking at the design of a honeycomb or plate catalyst, this is the distance between the centerline of one catalyst wall and the centerline of the opposite catalyst wall.

Cathode - This is the negative polarity, high voltage DISCHARGE ELECTRODE of a precipitator. It is the cathode that suffers metal erosion due to ESP repetitive sparkover - a common cause of localized wire thinning, draw-out due to weight tension, and ultimate breakage with sharp points.

Cell - A separate section of a precipitator which is energized by one TR set and which is located transverse to the gas flow. (a 4-cell precipitator would contain 4 parallel

electrically separated high voltage systems in each field) **Cell (in width)** - A cell is an arrangement of a bus sections parallel to gas flow. Note: Number of cells wide times number of fields deep equals the total number of bus sections.

Cell Plate (Tubesheet) - A steel plate to which the open end of the filter bags are connected. Separates the clear air and dirty air plenums of the baghouse.

Centrifuge - A device which separates the phases in a composite fluid stream by applying centrifugal motion to the stream and forcing the higher density component to the outside wall of the device where it is collected.

CFM (Cubic Feet Per Minute) - The cubic feet of air being moved through the system per minute. Must be expressed as actual (ACFM) Standard (SCFM) wet or dry (SCFM W or SCFM D)

Chamber - A gas-tight longitudinal subdivision of a precipitator. A precipitator with a single gas-tight dividing wall is referred to as a two-chamber precipitator. Note: very wide precipitator chambers are frequently equipped with non-gas-tight load bearing walls for structural considerations. These precipitators are by definition single chamber precipitators.

Chamber - A parallel sub-division of a large precipitator, which is sealed off from other chambers by a solid steel wall. Each chamber contains its own set of individual sections comprising CELLS and FIELDS.

Char - The carbonaceous material in dust - usually incompletely burned fuel which has larger particles than the rest of the dust.

Chemical Conditioner - A chemical used to lower the resistivity of dust to reduce or eliminate back-ionization.

Chimney Rain-out - A condition where moisture droplets leave a chimney plume and fall to the ground in the area around the chimney.

Clarifier - A large tank where slurries can be separated into a liquid stream and a solid stream. This is usually accomplished because the clarifier has a large volume that allows the dense solid particles to settle under the influence of gravity. The liquid steam exits the top of the clarifier and the more dense solid slurry is drawn from the bottom of the tank.

Clean Air Plenum - The baghouse area through which clean filtered gases are directed after filtration, located on the clean side of the bags above the tubesheet.

Cloth - In general, a pliant fabric that is woven, knitted, felted or otherwise formed from any textile fiber, wire, or other suitable

material.

Cloth weight - usually expressed in oz/yd2 or oz/ft2. However, cotton sateen is often specified at a certain number of linear yd/lb of a designated width.

Coal - Low-sulfur - The EIA sulfur content category of coal with less than 0.60 pounds of sulfur per million Btu. Less than or equal to 1%.

Coal - Medium-sulfur - The EIA sulfur content category of coal with 0.60 to 1.67 pounds of sulfur per million Btu. Greater than 1% and less than or equal to 3%.

Coal - High-sulfur - The EIA sulfur content category of coal with greater than 1.67 pounds of sulfur per million Btu. Greater than 3%.

Coating - Immersing the filter medium in a solution to provide the fibers with a coating that will lubricate and thereby reduce self-abrasion; in the case of woven-glass bags, the most common coatings have been Teflon and silicone graphite

Cold side ESP - An ESP, which is installed downstream of the air heaters.

Cold spot - A point where a continuous metallic heat transfer circuit through the insulation creates an uninsulated area, resulting in an area that is colder than the surrounding area.

Collecting Surface - Describes the reinforced sheet metal, usually 20, 18 or 16 ga (0.90, 1.25 or 1.65 mm), collector plate or plates that form the gas passages of precipitator parallel ducts. The electrically charged dust particles are deposited or collected on said surfaces by means of powerful electric forces applied directly to the particles, per se.

Collection Efficiency - A measure of dust collector's ability to remove particulate from the inlet gas expressed in percent. % Efficiency = (Dust in - Dust out)/Dust in x100.

Collection Electrode (CE) - The electrode (usually grounded) on which the particulate is deposited in an electrostatic precipitator. Also called collecting plate.

Collection Surfaces - The individual elements, which make up the collecting system and provide the total surface area of the precipitator for the deposition of dust particles.

Collection Surface Area - The total flat projected area of collecting surface exposed to the active electrical field (effective length) x (effective height) x (2) x (number of gas passages).

Collection Surface Rapper - A device, which imparts vibration or shock to the collecting surface to dislodge the deposited particles.

Colloidal - Having very small, insoluble, nondiffusible particles larger than molecules but small enough so that they remain suspended in a fluid medium without settling to the bottom.

Compressed Air - Pressurized air generated by a compressor used to clean filter bags in a pulse-jet baghouse. Measured in psi (pounds per square inch). (Kg/cm2)

Concentration - Amount of dust in the gas. Usually expressed in terms of grains/ft3, lb/1000 lb of gas, ppm, mg/m3, or lb/million Btu.

Conductivity - The reciprocal of resistivity - the units are Mho-meters (Mho = Ohm, spelled backwards).

Conical Hopper - A hopper shaped like an inverted cone.

Continuous Emission Monitor (CEM) - A device that approximates a continuous measurement of certain characteristics of a

gas by making separate measurements frequently. For compliance with the CAAA90, the measurements must be taken at least every 15 minutes. Two common types are an Extractive Continuous Emission Monitor and an In Situ Continuous Emission Monitor.

Control Damper - A device installed in a duct to regulate the gas flow by degree of closure. Examples: Butterfly or Multi-Louver.

Control Equipment - High voltage power supply control equipment generally consists of: electrical components required to protect, monitor and regulate the power supplied to the precipitator high voltage system.

Control Unit - Usually in an air conditioned room containing modern solid-state thyristor components for silicon-controlled-rectifier (SCR) electric power controls, microprocessor-mini computer type automatic voltage controls, instrumentation, protective devices, fault indicators, programmable inputs, various input and output signals capabilities, manual control switch, main line 1 or 3 ph, 50 Hz or 60 Hz circuit breakers, etc.

Corona - A gaseous discharge found near an ESP discharge electrode resulting in a faint glow caused by ionization of gas molecules due to the electric field.

Corona Power (KW) - The product of secondary current and secondary voltage. Power density or specific power is generally expressed in terms of: 1) Watts DC per square foot (square meter) of collecting surface. Or 2) Watts DC per 1000 ACFM or watts per 1000 AMCH of gas flow.

Coronizing - A heat cleaning process for fiberglass fabric to burn off the starches (used in processing) usually at temperatures of 1000 degrees F (537.7 degrees C) for a short duration before the finish is applied. Same as scouring.

Crimp - Waves contained in a yarn.

Curing - In finishing fabrics, the process by which resins or plastics are set in or on textile materials, usually by heating.

Current Density or Specific Current - The amount of secondary current per unit of ESP collecting surface.

Cyclone - A free vortex centrifugal separator that removes solids from liquids by combination of centrifugal force and liquid shear. Used in some systems to replace the liquid thickener/clarifier.

DBA (Dibasic Acid) - A mixture of organic acids (adipic acid, succinic acid, glutaric acid) used as a performance enhancing chemical in absorber towers.

Dead Band - In control circuits, the zone between the start of an action and when the action is reversed. This prevents the control action from cycling back and forth too quickly. In a home, the furnace starts when the temperature reaches a certain point. It continues to run until the temperature rises several degrees. This range of temperature is the dead band of the furnace control.

Denier - A weight-per-unit-length measure of any linear material. The size of yarns used in woven fabrics including scrims is defined or designated by denier.

deNOx - An abbreviation used to refer to the destruction of NOx by some process.

Density - The weight of a material divided by the volume of the material.

Dew point - The temperature of a gas at which condensation occurs. May be water dew point or acid dew point.

Diaphragm Valve - A compressed air valve operated by a pilot solenoid valve used to clean the filters in pulsejet or plenum pulse collectors.

Differential Pressure - The change in pressure or the pressure drop across a component or device located within the airstream;

the difference between static pressures measured at the inlet and outlet of a component, compartment or device (i.e., between the dirty and clean sides of filter bags and tubesheet).

Dimensional stability - Ability of the fabric to retain its size in hot or moist atmosphere.

Discharge Electrode (DE) - The part, which is installed in the high voltage system to perform the function of ionizing the gas and creating the electric field. Typical configurations are: rigid frame, weighted wire, rigid discharge electrode.

Discharge Electrode Rapper - The device for imparting vibration or shock to the discharge electrodes in order to dislodge dust accumulation.

Dolomite - A mineral composed of calcium carbonate and magnesium carbonate found in limestone deposits. It has the chemical formula $CaMg(CO_3)_2$.

Drag - Normalized value for pressure drop wherein pressure drop is normalized by dividing by the gas velocity. This property allows comparison of one dust/filter medium to another on a common basis and at various parts of the filtration cycle.

Dry FGD - An FGD process comprised of contacting a sulfur oxide containing flue gas with an alkaline material without saturating the flue gas and producing a dry waste product or dry by-product.

Duct - A gas passage or space between two parallel collecting plate surfaces. Duct widths now typically vary from 9 to about 16 inches (229-400 mm). An electrostatic precipitator forms an electrical capacitor between the DE assemblies and the grounded collecting plates on each side thereof in each duct. Effective capacitance of typical ESP is 30 - 40 picofarad/m2 plate area (9-10" ducts, wire DE).

Durometer - A device for measuring the firmness of a material. A spring forces a small diameter foot into the material being tested. The amount of force required to push the foot down until the material is exerting the same force back is the Durometer reading measured on a scale specified by the size of the foot. Rubber is typically measured using the Shore A scale.

Dustcake - Dust layer on filtration surface. A certain amount of porous dustcake is necessary for filtration purposes unless the fabric is a surface filtration type (BHA-TEX or spun bonded fabric).

Dust (or Mist) Concentration - The weight of dust or mist contained in a unit of gas, e.g., pounds per thousand pounds of gas, grains per actual cubic foot of gas, or grains per standard dry cubic foot (the temperature and pressure of the gas must be specified if given as volume). Metric equivalents are grams or milligrams/Kg of gas or milligrams/m3 of gas.

Dust Loading - The amount of solid particulate suspended in an air (gas) stream, usually expressed in terms of grains per cubic foot, grams per cubic meter or pounds per thousand pounds of gas.

Effective Cross-Sectional Area - Effective width times effective height.

Effective Height - The total height of collecting surface measured top to bottom.

Effective Length - The total length of collecting surface measured direction of gas flow.

Effective Migration Velocity - This parameter, defined by the Deutsch-Anderson relationship, is related to the average speed with which dust particles in an electrostatic precipitator move towards the collecting electrode. Values are generally stated in terms of ft/min. or cm/sec.

Effective Width - Total number of gas passages multiplied by spacing dimension of the collecting surfaces.

Electrical Set - May refer to the complete high voltage power supply energizing a precipitator section, or to the TRANSFORMER-RECTIFIER SET, per se, which is a major part of said power supply. The other principal parts of the complete ESP power supply include the special LINEAR REACTOR connected in series with the transformer primary circuit, and the CONTROL UNIT.

Electrostatic Precipitator (ESP) - A unit comprised of a series of parallel vertical plates through which the flue gas passes. It electrically charges the ash particles in the flue gas to collect and remove them.

End - same as warp thread

End count - Same as warp count

Energy - Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatt-hours, while heat energy is usually measured in British thermal units.

EPA - Environmental protection Agency.

ESP - Abbreviation short form of ELECTROSTATIC PRECIPITATOR or ELECTRO FILTER.

Ex situ oxidation (wet FGD) - Forced oxidation that occurs outside of the scrubber and is used to produce FGD gypsum.

Excess Air - This is the amount of air in a boiler combustion zone that is in excess of the amount of air that is required to completely burn the fuel.

Exothermic - A chemical change in which there is a liberation of heat, as in combustion.

Extractive Continuous Emission Monitor - A CEM that draws exhaust gas away from the combustion system to the measurement equipment through special ducts.

Evaporative Gas Cooling - Water is sprayed into a hot gas stream. Energy is absorbed by the water as it is transformed from a liquid to gas, thus reducing the temperature of the gas stream. This technology is used to condition a gas stream to optimize the efficiency and reliability of air pollution control equipment. Also called adiabatic gas cooling.

Extensibility - Stretching characteristics of fabric under specified conditions.

Fabric - A collective term applied to cloth no matter how constructed and regardless of the kind of fiber used. In the commonest sense, it refers to a woven cloth.

Fan - A device for moving air and dust through the system. If the fan is on the dusty side of the collector pushing the dust-laden air through the collector, it is called a positive system. If the fan is on the clean airside of the collector pulling the air through the collector, it is called a negative system. (Most collectors are negative systems)

Federal Energy Regulatory Commission (FERC) - A quasi-independent regulatory agency within the Department of Energy having jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification.

Felt (Needled) - A fabric produced by using barbed needles to interlock carded fibers.

Felted bag - Type of bag frequently used on pulse-jet dust collectors. Features a thick mat of fibers supported by a woven backing or scrim.

FGD Material - This wet thixiotropic sludge from limestone-based reagent wet scrubbing process is predominantly calcium sulfate dihydrate, which is gypsum. This material readily dewaters, and there are systems in use where the slurry is transported to a pond and construction equipment is used to excavate and stockpile the gypsum.

Fiber - A slender, elongated structure of synthetic material. A group of fibers that form a single substance, such as flax.

Field (In depth) - An arrangement of bus sections perpendicular to gas flow energized by one or more high voltage power

supplies.

Fill - crosswise threads woven by loom. Yarn running from selvage to selvage at right angles to the warps in woven fabrics.

Fill count - Number of fill threads per inch of cloth.

Fill Yarn - An individual yarn, which interlaces with the warp yarn at right angles in a woven fabric. Also known as a pick or filling pick. These run around the circumference of the bag.

Filter cake - the accumulation of dust on a bag which often assists in the filtration process or the material produced by filtering equipment such as vacuum filters for dewatering wet FGD material.

Filter Drag - The ratio of differential pressure across the filters (differential pressure, inches or mm W.C. to velocity through the filters (air-to-cloth ratio, MPM meter/minute)

Filter Media - The permeable barrier employed in the filtration process; the fabric on which the filter cake is supported.

Filtration - A process by which particles are separated from a fluid stream by use of a permeable barrier.

Fixation - A process of stabilization of sludge involving the addition of reagents causing chemical reactions with the sludge, generally of a cementatious nature.

Flange-to-flange - The APC equipment from inlet flange to outlet flange.

Float - The position of a yarn that passes over two or more yarns passing in the opposite direction.

Flocculant - Charged polymers used in industry for clarifying suspensions. They cause suspended colloidal matter to aggregate, forming particles that are large enough to settle out under gravity.

Flue Gas Desulfurization Unit (Scrubber) - Equipment used to remove sulfur oxides from the combustion gases of a boiler plant before discharge to the atmosphere.

Fluoroelastomers - A class of synthetic rubber which provide extraordinary levels of resistance to chemicals, oil and heat, while providing useful service life above 200 degrees C. The outstanding heat stability and excellent oil resistance of these materials are due to the high ratio of fluorine to hydrogen, the strength of the carbon-fluorine bond, and the absence of unsaturation.

Fly ash - Dust from a furnace; the term distinguishes the ash that is entrained in the gas from bottom ash which drops to a grate or pan at the bottom of the furnace. The fly ash particle diameter is less than .0001 meter. This is usually removed from the flue gas using flue gas particulate collectors such as baghouses and electrostatic precipitators.

Flywheel - A heavy wheel for regulating the speed and uniformity of motion of the machine to which it is attached.

Fossil Fuel - Any naturally occurring organic fuel, such as petroleum, coal, and natural gas.

Fouling - The formation of high temperature bonded deposits on convective heat absorbing surfaces.

Gas Distribution Devices - Internal elements in the transition or ductwork to produce the desired velocity contour at the inlet and outlet face of the precipitator. (See Gas Distribution)

Gas Distribution Plate Rapper - A rapper used to prevent dust buildup on gas distribution devices.

Gas Passage - A duct formed by two adjacent rows of collecting surfaces.

Gas sneakage - Bypassing of dust laden gas around ESP electrified regions, such as through hoppers and above the collecting

plates.

Gas-to-cloth ratio - Gas volumetric flow rate/cloth area...the amount of process gas entering the fabric filter dust collector divided by the amount of cloth area filtering the dust from the air. Normally the gas flow is given in CFM and the cloth in square feet.

Generating Unit - Any combination of physically connected generator(s), reactor(s), boiler(s), combustion turbine(s), or other prime mover(s) operated together to produce electric power.

Generation - Gross - The total amount of electric energy produced by the generating units at a generating station or stations, measured at the generator terminals.

Generation - Net - Gross generation less the electric energy consumed at the generating station for station to station use.

Generator Nameplate Capacity - The full-load continuous rating of a generator, prime mover, or other electric power production equipment under specific conditions as designated by the manufacturer.

Gigawatt (GW) - One billion watts of capacity.

Glazing - High-pressure pressing of the filter medium at elevated temperatures; fuses surface fibers to the body of the filter medium.

Grab tensile - The tensile strength, in lb/in, of a textile sample cut 4 in. by 6 in. and pulled in two lengthwise by two 1 in. sq. clamp jaws set 3 in. apart and pulled at a constant specified speed.

Grain - A dust weight unit commonly used in air pollution control equal to 1/7000 lb.

Grain Loading - The amount of particulate by weight in a given volume of air (Grains/ft3); 1 lb (0.454 Kg) = 7000 grains.

Greenfield Unit - A newly constructed generating unit.

Greige (Grey, Greige, Gray) - Cloth, regardless of color, that has been woven in a loom, but has received no dry or wet finishing operations. Unfinished woven fabric.

Grits - The hard, coarse particles that will not dissolve in a lime slaker and must be removed and disposed of.

Gypsum - Formed from forced oxidation in a calcium-based FGD process. Also, a precipitated gypsum formed through the neutralization of sulfurous acid (H_2SO_3) in FGD process at coal-fired power plants. This gypsum can vary in purity, which is defined as the percentage of $CaSO_4*2H_2O$, and generally is over 94% for use in wallboard manufacturing.

Hardgrove Grindability Index (HGI) - A measure of the relative ease with which coal can be pulverized or ground. Higher grindability indicates coal which are easier to grind.

Header - A pressurized pipe that contains the compressed air supply for a pulse type baghouse.

Heat Set Finish - Heat finishing treatment that will stabilize many man-made fibers so that there will be minimal change in shape or size.

High Voltage Bus - A conductor enclosed within a grounded duct.

High Voltage Conductor - A conductor, which carries the high voltage from the transformer-rectifier to the precipitator high voltage system.

High Voltage Power Supply - The supply unit, which produces the high voltage required for precipitation, consisting of a transformer-rectifier and controls.

High Voltage System - All parts of the precipitator, which are maintained at a high electrical potential.

High Voltage System Support Insulator - A device, which physically supports and electrically isolates the high voltage system from the grounded structure.

Hopper - The vessel at the bottom of a precipitator where dust falls as it is rapped from the electrodes.

Hopper Capacity - The total capacity of a hopper measured from a point some distance below the high voltage system or plates, whichever is lower.

Hot side ESP - An ESP, which is installed upstream of the air heater.

Hot-Wire Anemometer - A device that measures gas flow by its cooling effect on a heated element. Air velocities of centimeters per second can be measured by this method.

Hydrated Crystal - The natural form of many crystalline materials. Some water has been chemically combined in the crystal matrix.

Hydrated Lime - Calcium Hydroxide ($Ca(OH)_2$) that is formed by reacting quicklime and water in a lime slaker.

Hydroclone - A device for separating particles of varying densities in a liquid steam by spinning the liquid rapidly in a cyclonic manner and drawing off product steams at various locations in the cyclonic profile.

Hydrogen Sulfide - H_2S is a colorless highly toxic gas that is heavier than air and has a "rotten eggs" odor.

Hydrolyzer - This kettle reboiler style heat exchanger is used to convert a solution of urea into a mixture of ammonia, carbon dioxide and steam.

Hydrophilic fibers - Fibers that do not readily absorb water.

Hydroxyl Group - The term used to describe the functional group -OH when it is a substituent in an organic compound. Organic molecules containing a hydroxyl group are known as alcohols and have the formula $C_nH_{(2n+1)}$-OH, the simplest of which is methyl alcohol (CH_3-OH)

Hygroscopic - Attracting or absorbing moisture from the air.

Impedance Device - A linear inductor or current-limiting reactor required to work with SCR-type controllers. A transformer with a specially designed high impedance core and coils. Saturable core reactor. Resistors.

Impingement - the physical contact of dust laden gas flow against a filter media. Typically referring to an abrasive wear caused by this impact.

Inch of Water - A unit of pressure equal to the pressure exerted by a column of liquid water one inch high at standard conditions(70 degrees F or 21 degrees C @ sea level); 27.7 inches of water (703 mm w.c.) = 1 psi (69 mbar); usually expressed as inches water gauge (w.g.) or inches water column (w.c.)

Inlet dust loading - A measure of the particulate matter entering an ESP expressed in grains of particulate matter per actual cubic foot of flue gas.

Inside Collection - Particles are collected on the inside surface of the bag (most reverse air and most shaker baghouses).

In Situ Continuous Emission Monitor - A CEM that makes measurements directly in the flue or exhaust pipe.

In Situ Oxidation (wet FGD) - A process in which both SO_2 absorption and oxidation are carried out within the scrubber.

In-situ Resistivity - Particle resistivity as determined by a probe inserted into the flue gas stream.

Insulator Compartment - An enclosure for the insulator(s) which supports the high voltage system (may contain one or more insulators).

Interfacing - Openings between the interlacings of the warp and filling yarns in a fabric.

Interstices - The opening between the interlacings of the warp and filling yarns, i.e. the voids in the fabric through which air/gas passes.

Isokinetic Sampling - A sampling of the flue gases drawn from the mainstream of the gas into the sampling apparatus with no change of velocity.

Kiln - A furnace or oven for drying, burning, or baking something.

Kilowatt (kW) - One thousand watts of capacity.

Kilowatt-hour (kWh) - One thousand watthours.

Linear Reactor - A vital element for assuring reliable, stable electric energization at optimum current densities and highest ESP performance capability. It is an iron-core, convection-cooled inductance whose value is chosen according to rated power supply DC current output. The reactor has several important functions:

1) Essential series circuit impedance in the primary of the HV transformer acting as a ballast for stability with sparking load and limiting peak power supply current flow during ESP sparking to safe values.

2) ESP current waveform control adjustment capability to match power supply ratings to load demands for the best ESP performance and to prevent premature sparking.

3) Proper inductance values for TR Set ESP current conduction times of 70-86% maximum time between current pulses of 8.333 milliseconds (FW energization) provides for fast voltage and current recovery following a spark.

4) Slow down otherwise very steep rate of rise of currents when main SCRs are turned on and off 120 times a second, and protect silicon diodes in HV rectifier from damage by securing a nearly half sine wave shape for the ESP current pulses.

It is not the installed TR Set capacity that does the job; it is only the actual voltages and currents drawn under optimum conditions of electrode geometry, electrode alignment, and TR Set match to load that counts. In cases where high power TR Sets are running at only 10-50% of rated current capacity that major gains in useful electrical energy and ESP performance can often be realized by using an appropriately larger size reactor inductance to match a revised TR Set rating more closely to the ESP current needs at hand. The larger inductance is chosen to increase the ESP current conduction time to the optimum range of 70-86% instead of the original short conduction time of perhaps 25-55%. The broader current pulses result in significant increases in average DC precipitator currents and voltages, reduce premature sparking due to narrow current pulses and peaky voltage waveforms which limit useful current unnecessarily. Achieving the best possible electrical energization quality pays off handsomely in high ESP performance. In cases where proper operating currents are unknown, or to accommodate possible shifts in coal quality, etc., from time to time, it is convenient to use tapped linear reactors to cover a range from say one-half to full load in three taps.

Landfill - A site for the disposal of all conducive wastes. Landfill configuration may be heaped, side hill or valley fill.

L/G - Liquid to gas ratio which is defined as the recirculated absorbent liquid flow rate (gpm) divided by the absorber outlet gas flow rate (acfm/1000).

Lignite - A brownish-black coal of low rank with high inherent moisture and volatile matter (used almost exclusively for electric power generation). It is also referred to as brown coal. Lignite contains approximately 9 million to 17 million Btu per

ton.

Loom finish - Same as greige cloth.

Low-NO_x Burners - Burners that utilize special arrangements of fuel and air injection ports, which reduce the formation of NO_x during combustion.

Magnehelic Gauge - An instrument used to measure the differential pressure drop between two points in a system.

Maintenance Costs - Maintenance costs are the portion of operating expenses consisting of labor, materials, and other direct and indirect expenses incurred for preserving the operating efficiency and/or physical condition of utility plants used for power production, transmission, and distribution of energy.

Mandrel - A large rotating circular form used as a core around which glass fiber covered with resin is wound creating a cylinder of fiberglass reinforced plastic (FRP)

Manometer - A U-shaped tube filled with a specific liquid. The difference in height between the liquid in each leg of the tube is the differential pressure between the two points being monitored. Used to monitor differential pressure.

Manual Power Supply Control - The manual regulation of high voltage power based on precipitator operating conditions observed by plant operators.

Megawatt (MW) - One million watts of capacity.

Megawatt-hour (MWh) - One million watt-hours of electric energy.

Micron - A unit of length, 1/25,000 of an inch (1/1000 of one millimeter) here used as a measurement of the largest diameter of a particle; 74 microns are equal to a 200 mesh opening.

Migration Velocity - A parameter in the Deutsch-Anderson equation used to determine the required size of an electrostatic precipitator to meet specified design conditions. Values are generally stated in terms of ft/min or cm/sec. See also "effective migration velocity".

Mist Eliminator - That part of an absorber designed to remove entrained liquid droplets from the exiting gas stream.

Mit Flex Endurance Test - A test whereby a filter media specimen is rapidly flexed in an arc under a specified load until fabric rupture occurs. Test conditions are usually: 270 degree arc, 180 cycles/minute, 4 lb load, 1/2 inch width specimen.

Modacrylic - A synthetic polymerized fiber that contains less than 85% acrylonitrile.

Mullen Burst Test - Evaluation of the rupture strength of paper or cloth using a hydraulic diaphragm. Expressed as the pressure per square inch that will burst a two inch diameter test specimen.

Multifilament - Yarn composed of several filaments, which are continuous strands of fiber of indefinite length.

NAAQS - National Ambient Air Quality Standards (U.S.A. Clean Air Act)

Nacolite - A natural mineral form of sodium carbonate used in sodium scrubbing or converted into Soda Ash.

Napping - A scraping of the filter-medium surface that raises the surface fibers. The rupturing of the filling yarns to produce a fleecy surface on woven fabrics.

Needled felt - A felt constructed by the use of barbed needles moving up and down, pushing and pulling the fibers to form an interlocking of adjacent fibers.

Negative Pressure Baghouse - A system where fan is located after the baghouse on the clean air side, pulling air through the system.

NH_3 - This is the chemical symbol that represents ammonia.

Non-Regenerable FGD - Process that consumes the sorbent.

Nonwoven felt - felt made either by needling, by matting of fibers, or by compressing with a bonding agent for permanency.

NOx - This is the chemical symbol that represents a mixture of nitrogen oxide (NO) and nitrogen dioxide (NO_2) that is present in combustion flue gas. The subscript x symbolizes that the ratio of nitrogen oxide to nitrogen dioxide can vary and is unknown at any exact moment in time.

NPDES - As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

NSPS - New Source Performance Standards.

Null Period - The period during the cleaning sequence in which neither cleaning nor on-line filtering is occurring, causing a static environment to allow dust to drop into hopper or discharge area.

Opacity - The degree of imperviousness to the passage of light used to measure visual density of stack emissions, usually expressed in percent.

Operations Costs - Operations costs are the components of power production that incur cost for operations that are directly related to producing electricity. The major item is almost always fuel that has to be burned to generate electricity.

OSHA - Occupational Safety and Health Act. (U.S.A.)

Overfire Air - This is the air that is injected into a boiler combustion zone at a location above the burners to complete combustion of the fuel. This is typically done when less secondary air is being injected at the burners to reduce NOX emissions.

Oxidation - When oxygen is added to a material to chemically transform it into a different material.

Oxidation - Forced - An additional unit operation to a wet FGD process that intentionally oxidizes the sulfite specie to sulfate by the introduction of supplemental air or catalysts or both.

Oxidation - Natural - That which results from the reaction of absorbed sulfite specie with dissolved oxygen originating from flue gas and incidental contact with atmospheric oxygen.

Outside Collection - Systems that are designed to collect dust on the outside of the filter. (Pulse-jet/plenum pulse baghouses and some reverse air and shaker baghouses.)

Particle resistivity - The electrical resistance (inverse of conductivity) of fly ash particles expressed in units of ohm-cm.

Particle size - The diameter in micrometers of a particular piece of particulate matter.

Particulate matter - Solid or liquid particles entrained in a gas stream.

Penthouse - An enclosure over the precipitator, which contains the high voltage insulators.

Permeability - The property of being open to the passage or penetration of gas or liquid through a material. A measure of fabric porosity or openness, expressed in cubic feet of air per minute per square foot of fabric at a 0.5 in. w.c. (13 mm w.c.) pressure differential.

pH - A measure of acidity or alkalinity that ranges from 0 to 14. A pH measurement of 7 is regarded as neutral. Measurements below 7 indicate increased acidity, while those above indicate increased alkalinity.

Photohelic Gauge - An instrument used to measure differential pressure that has adjustable set points for starting and stopping the filter cleaning in order to maintain the desired range of operating differential pressure.

Pitot Tube - A common instrument used for velocity determination in ducts leading to and from air pollution control devices.

Pitting - An extremely localized form of corrosion that leads to the formation of small holes in metal.

Plain weave - A weave in which each warp yarn passes alternately over each filling yarn.

Plant-Use Electricity - The electric energy used in the operation of a plant.

Plenum - An enclosure typically fabricated of stiffened sheet metal; casing; housing (See clean air plenum).

Plume Rise - As flue gas exits a chimney, it is desirable for it to be buoyant and continue to rise rather than fall back towards the chimney creating a mushroom shaped cloud. Heat is sometimes added to increase buoyancy or a restriction at the chimney exit is added to increase exit velocity and insure proper plume rise.

Ply - Two or more yarns joined together by twisting

PM - Particulate Matter

Poppet Valve - A valve utilized to isolate compartments and/or allow for reverse airflow through individual compartments. Typically constructed of a flat wafer plate assembled on the end of the shaft of an air cylinder, which drives the wafer (poppet) into position against a seat or ring, which causes the seal.

Porosity - Sometimes erroneously used as a synonym for permeability. Originally a designation for the amount of air in a fabric, i.e. blankets.

Positive Pressure System - A system with a fan located prior to the collector on the dirty side, pushing air through the system.

PPB - Parts Per Billion

PPM The concentration of one material mixed with another material expressed in parts per million. A 3 ppm solution of salt in water would be 3 pounds of salt added to one million pounds of water.

Precipitate - To cause a slightly soluble substance to become insoluble and separate out of a solution.

Precipitator Current - The rectified or unidirectional average current to the precipitator.

Precipitator Gas Velocity - A figure obtained by dividing the volume rate of gas flow through the precipitator by the effective cross-sectional area of the precipitator. Gas velocity is generally expressed in terms of ft./sec. And is computed as follows:

Velocity = Gas volume (ACFM) divided by Effective cross-section area (ft2) or actual meters cubed divided by sq. meters (Effective cross-section is construed to be the effective field height x width of gas passage x number of passages.)

Precoat - Material added to the air stream on initial process startup to aid in establishing an initial dustcake on the filter bags.

Pressed felt - A type of felt manufactured by pressing fibers into a scrim.

Pressure Drop - A measure of the resistance the gas stream encounters as it flows through a collection system. May refer to pressure differential across the tubesheet, across the entire collector or the pressure drop across the entire system. Commonly referred to as Delta P; see differential pressure.

Primary Air - This is the air that is injected into a burner along with the fuel. This air transports the fuel into the burner.

Primary Current - The current in the transformer primary.

Primary Voltage - The voltage across the primary of the transformer.

PSD - Prevention of Significant Deterioration (U.S.A. Clean Air Act)

PSI - Pounds per square inch; a unit of pressure; 1 psi equals 27.7 in. (70.35 cm) water gauge or 2.04 in. (5.18 cm) mercury (Hg).

Pulse Cycle - On a pulse-jet baghouse, the interval of time between one pulsing of a row of bags and the next pulsing of the same row.

Pulse Duration (On-time) - The length of time a pulse lasts, generally described as the length of time the electrical signal holds the solenoid pilot valve open. However, due to mechanical losses, the time the diaphragm is open will vary.

Pulse Interval (Off-time) - Elapsed time between pulses in a pulse-jet collector.

Pulse Jet - Generic name given to all pulsing collectors.

Pulverizers - Mills of various designs used to finely grind the coal which is swept from the mills by air for pneumatic transport directly to the burners.

Pyramid Hopper - A hopper shaped like an inverted pyramid.

Quarry - A place where stone is excavated.

Quicklime - Calcium Oxide (CaO) that has been produced by a calcination process where crushed limestone is fed through a kiln and the heat of the kiln drives the carbon dioxide (CO_2) from the limestone ($CaCO_3$).

Radiant Cooling - A method of reducing exhaust gas stream temperature, which involves the use of long uninsulated ducts that allow the gas stream to cool as heat radiates from the duct walls.

Rapper Insulator - A device to electrically isolate discharge electrode rappers yet mechanically transmit forces necessary to create vibration or shock in the high voltage system.

Rappers (Both CE and DE) - May be vibrator or impact (shock) type, the latter preferred. Function is to remove collected dust from collecting plate electrodes and from discharge electrodes. Individual electric type, single impact rappers. The function is to accelerate the metal electrodes away from the deposited material.

Rapping Intensity - Acceleration in multiples of acceleration due to gravity measured at various points on collecting or discharge electrodes. Measured forces should be specified as longitudinal or transverse.

Rapping Re-entrainment - Dust, which has been rapped from the electrodes and is carried back into the gas stream. This process can substantially lower the collecting efficiency of a precipitator.

Reagents - Pure forms of chemicals that are added to a process to react with other chemicals in the process to form reaction byproducts.

Reduction - When oxygen is removed from a material to chemically transform it into a different material.

Re-entrainment - The phenomenon whereby dust, which has been removed from a filter is returned to the air stream. It occurs when dust is cleaned from a filter and then caught again by an upward moving air stream, which re-deposits it on a filter.

Regenerable FGD - Process that regenerates and recycles the sorbent.

Reheat - A heat transfer process by which the absorber outlet flue gas temperature is increased for the purpose of increasing plume buoyancy, reducing a visible plume, or preventing downstream corrosion.

Residence Time - The time period for a given volume of liquid or gas throughput to pass through a vessel. When referred to an absorber, it is defined as the absorber's internal volume through which gas passes (cu. ft.) divided by the absorber outlet flue gas flow rate (acfs).

Resistance - In airflow, caused by friction of the air against any surface or by changing the momentum of the gas.

Resistivity - The electrical resistance that a meter cube of a substance (usually of packed dust) has when measured between opposite faces of the cube. The units are ohm-meters (or ohm-centimeters - a resistivity of 1 cm is equivalent to a resistivity of 100).

Retention Tank - Provides residence time for the absorbent recirculation flow for the purpose of allowing sufficient time to complete chemical reactions.

Reverse-air Baghouse - A unit employing reverse flow flushing air to clean the dust from the bags.

Rings - metal bands sewn in the bag at various intervals to prevent bag from total collapse while cleaning.

Rotary Airlock Valve - A material handling valve that transfers material in pockets formed by vanes mounted on a turning shaft similar to a paddle wheel. This star wheel shaped shaft rotates in close fitting housing that provides a dust-tight seal while still transferring material through the valve.

Rotating Vane Anemometer - A windmill-like device, small enough to be held in the hand, for measuring air speed and direction.

Safety Ground Device - A device for physically grounding the high voltage system prior to personnel entering the precipitator. The most common type consists of a conductor, one end of which is grounded to the casing, the other end attached to the high voltage system using an insulated operating lever or handle.

Saturable rectifier - A variable impedance device to regulate the current at the transformer primary.

SCA - Specific collecting area, given by the square feet of collecting area per 1000 acfm of flue gas.

Scale - Any thin, flaky or plate like layer or coating which forms on the inside of metal containers.

SCFM - Standard cubic feet per minute. The volume of dry gas flow per minute at standard temperature and pressure conditions (70 degrees F or 21 degrees C @ sea level). Other standards such as 32 degrees F and 29.92 inches of mercury (chemical engineers) and 60 degrees F, 30 inches of mercury saturated (American Gas Assn.) may be used. Always specify which standard.

Scouring (ESP) - The process in which collected dust is removed from the collecting electrodes by the gas flow. Usually associated with a region of high velocity.

Scouring (FF) - Process of removing the starches and lubricants, which were applied to fabric to protect it during weaving. Fabrics that have been scoured are generally softer and better withstand clean action. Same as coronizing.

SCR – Selective Catalytic Reduction.

Scrim - An open mesh, plain-weave cloth used as the base in some felted fabrics.

Scrubber - Any of several forms of chemical/physical devices that remove sulfur compounds formed during coal combustion and especially from coal-fired power plants.

Scrubber Sludge - Another name for wet FGD material

Secondary Air - This is the air that enters a boiler around the periphery of the burners. This air is needed to complete the combustion of the fuel as it exits the throat of the burner.

Secondary Current - The current in the transformer/rectifier secondary is the main energy source.

Secondary Voltage - The voltage as indicated by AC voltmeter across the secondary of the transformer.

Seeding - The application of a relatively coarse, dry dust to a bag before startup to provide an initial filter cake for immediate high efficiency and to protect bags from blinding. Also called precoating.

Selective Catalytic Reduction (SCR) - The name of the process where ammonia in the presence of a catalyst bed reacts to remove NOx from a flue gas stream in a moderate temperature external vessel.

Selective NonCatalytic Reduction (SNCR) - The name of the process where ammonia reacts to remove NOx from a flue gas stream in the high temperature section of a boiler.

Selvage - The binding on the lengthwise edge of a woven fabric.

Set Point - In a control circuit, the value when an action by the control system will be initiated.

Shaker baghouse - A unit wherein cleaning is accomplished by shaking the bags.

Silicon Controlled Rectifier (SCR) - A semi-conductor, electronic switch for voltage regulation; two are used in an inverse parallel arrangement for each half cycle, positive and negative. Also called thyristor.

Silicone finish - A treatment with silicone to provide a slick finish for improved dust release.

Sine Wave - A waveform consisting of a positive and negative half cycle, each one lasting 8.33 milliseconds. Based on U.S.A. power generation at a 60 hertz cycle or European at 50 hertz.

Singeing (Singed Finish) - The process of burning off or melting fibers protruding from fabric surface by passing it over a flame or heated copper plates. Singeing gives the fabric a smoother surface, which aids in dustcake release, particularly in applications where moisture is a problem.

Sinusoidal - Moving in simple harmonic motion according to the function A sin (2 p f t) where A is the amplitude of the wave, f its frequency, and t is time.

SIP - State Implementation Plan

Sizing - A protective coating applied to yarn to ensure safe handling.

Slagging - The formation of molten, partially fused resolidified deposits on furnace walls or other surface exposed to radiant heat.

Slaker - A device to mix quicklime and water in such a manner as to cause a chemical reaction producing calcium hydroxide.

Slip - The proportion of dust escaping from the precipitator outlet. Slip may be expressed as a decimal fraction, or a percentage. It is usually estimated by dividing the outlet dust burden by the inlet dust burden. Also used to quantify conditioning materials such as sulfur trioxide and ammonia leaving the precipitator.

Slippage - The movement of yarns in a fabric due to insufficient interfacings.

Slurry - A mixture of liquid suspended solids (e.g. recycle slurry, lime slurry).

SNCR – Selective non-catalytic reduction.

Sneakage - The process in which dust-laden gas escapes through the treatment zone, either through the top, bottom or around the sides. Each percent of gas sneakage reduces the attainable precipitator collecting efficiency by almost one percent.

Soda Ash - The manufactured form of sodium carbonate used in sodium based scrubbing.

Solenoid Valve - Often times referred to as a "pilot valve", it is an electromechanical plunger energized to either a "normally closed" or "normally open" position to allow for relief of air pressure. In a baghouse, the solenoid valve is normally used to activate a compressed air device.

Soluble - Can be dissolved; capable of passing into solution.

Space-Charge - The charge present (as dust particles, gas ions, and free electrons) in the space between the electrodes. Space-charge modifies the local electric field in an electrostatic precipitator in a way analogous to spacecharge modifying the field inside a thermionic diode. The space-charge strengthens the field near the collecting electrode (anode) and weakens the field near the discharge electrode (cathode).

Spark - A short, self-extinguishing discharge from the high voltage system to the grounded system. Sparks effectively cause the gas stream to act as a conductor.

Specific Collecting Area (SCA) - A figure obtained by dividing total effective collecting surface of the precipitator by gas volume expressed in thousands of actual cubic feet per minute. In the metric system it is expressed as square meters per thousand actual cubic meters per hour.

Specific Corona Power - The quotient of the total corona power of all precipitator bus sections divided by the total gas volume handled by the precipitator, multiplied by 1000. Units are expressed as watts/1000 acfm.

Specific Gravity - The ratio obtained by taking the density of a volume of a material and dividing it by the density of the same volume of water.

Specific Resistance Coefficient of the Filter Cake - An indicator of how rapidly pressure drop increases during filtration.

Spray Tower Cooler (Conditioning Tower) - A tower or cylinder into which a hot gas stream enters and water is sprayed. As the water evaporates, the gas stream is cooled to the desired exit temperature by adiabatic cooling.

Spun fabric - fabric woven from staple spun fiber; same as staple.

Spunbonded - A non-woven fabric formed by producing, laying and self-bonding a web of filamentous material in one continuous set of processing steps. Usually made of polyester, polyamides or olefins.

Stabilization - The addition of fly ash, soil or other similar material to induce physical changes without chemical interaction between the additive and the sludge.

Staple fiber - Short fiber cut to specific length in synthetics, 1.5 in., 2 in., 2.25 in., etc. Also, natural fibers of a length characteristic of fiber, animal fibers being the longest.

Stoichiometry - The ratio of how much lime or limestone was added to the scrubber to remove a quantity of SO_2 divided by the theoretical amount of lime or limestone that should have been used to remove that same quantity of SO_2.

Sub bituminous Coal - A dull black coal of rank intermediate between lignite and bituminous. The contents of sub bituminous

coal ranges from 16 million to 24 million Btu per ton.

Sulfate Reducing Bacteria - A group of anaerobic bacteria (i.e. don't need oxygen) that obtain energy from iron or sulfur and generate hydrogen sulfide (H_2S).

Sulfate Saturation - The maximum concentration of the sulfate ion per unit volume of slurry or solution, above which the sulfate specie crystallizes as an alkali or earth alkali salt.

Sulfur - One of the elements present in varying quantities in coal which contributes to environmental degradation when coal is burned.

Sweepage - Sweepage is the process by which gases passing beneath the electrodes of a precipitator pick up dust from the hoppers and carry it out of the precipitator. Sweepage can severely limit precipitator efficiency and is usually controlled by means of baffles.

Tadpole Tape - A gasket material that has a flat cross section with a large bulbous section attached to one edge. It gets its name since this cross section looks like a tadpole.

Temperature - Adiabatic Saturation - The temperature, below which for a given mixture of gas and vapor, no additional vapor can be added at specified conditions (partial pressure of vapor is equal to vapor pressure of the liquid at the gas-vapor mixture temperature).

Temperature - Approach - The difference between the actual temperature of a given gas-vapor mixture and the adiabatic saturation temperature of that gas-vapor mixture.

Temperature - Spray Down - The difference between the inlet and outlet temperature of flue gas passing through an absorber.

Tensile Strength - The force required to pull apart the fabric; this is designated by the measure of resistance to a testing machine (in pounds) that a fabric provides before the material breaks. The test strip width depends on the type of fabric.

Tenter frame - A machine for drying cloth under tension (Tentering: also called framing).

Texturized Yarn - Filament glass yarn that has been processed by high pressure air passing through the yarn to open of the yarn bundle, providing more surface area.

Thickener - A large diameter vessel with a conical bottom used to separate solids from a liquid using the principal of gravity settling in a large still volume of liquid.

Thiosulfate - The ion S_2O_3 which is a strong reducing agent. In the photographic process, it dissolves the silver salts and is known as a fixer in developing films and prints.

Thixiotropic - A thixiotropic material is one that becomes more liquid as higher shear stresses are applied to it. When the stresses are removed, the material behaves more like a solid.

Thread count - The number of warp and filling yarns in a fabric.

Throw - A process of doubling or twisting fibers into a yarn of the desired size and twist.

T/R (TR) - Transformer rectifier.

Titanium Dioxide - This material is the primary ingredient of SCR catalyst. It forms the ceramic structure that holds the other constituents of the catalyst. The titanium dioxide does not take part in the reactions with the NOX

TR Set - Consisting of an oil or liquid insulation filled tank containing the high voltage transformer, a silicon diode, full-wave (FW) bridge rectifier assembly and usually a high voltage resistance divider calibrated for indicating the ESP operating voltage

on an external kilovolt (KV) meter. On top of the tank is the high voltage output bushing, which is connected via pipe and guard to the HT frame of a typical ESP section. The TR Sets are located on the ESP roof. A nameplate on the tank specifies all connections and ratings. A tank with two HV bushings is equipped for HW (half-wave) energization - rarely used in modern ESPs.

Transformer/Rectifier - A unit comprising a transformer for stepping up normal service voltages to voltages in the kilovolt range, and a rectifier operating at high voltage to convert AC to unidirectional current (DC).

Treatment Time - A figure, in seconds, obtained by dividing the effective length in feet of a precipitator by the precipitator gas velocity figure calculated above. The length of time it takes process gas to move through the treatment zone.

TRI - Toxic Release Inventory

Trona - A natural mineral form of sodium carbonate used in sodium scrubbing or converted into Soda Ash.

Tubesheet (Cell Plate) - The steel plate with holes to which the open ends of bags and cages are connected; separates the clean air and dirty air sections of the baghouse.

Turning Vanes - A gas distribution device in which vanes in ductwork or transition guide the gas and dust flow to minimize pressure drop and control the velocity and dust concentration contours.

Turnkey - Complete APC system including all dust pickups, ducting, dust discharge auxiliaries and all equipment, which is part of the dust collection system.

Twill weave - Warp yarns floating over or under at least two consecutive picks from lower left to upper right, with the points of intersection moving one yarn outward and upward or downward on succeeding picks, causing diagonal lines in the cloth.

Twist - The number of complete spiral turns in a yarn, in a right or left direction, i.e., "Z" or "S", respectively.

U-Tube Manometer - (see Manometer)

Upper Weather Enclosure - A non-gas-tight enclosure on the roof of the precipitator to shelter equipment (T/R sets, rappers, purge air fans, etc.) and maintenance personnel.

Urea - Urea is a solid material that is typically used as a fertilizer. If it is dissolved in water and then subjected to heat and pressure, it can be converted to ammonia for use in the SCR process. Some localities have preferred this system because the amount of ammonia present in the system at any moment in time is very small.

Utilization - A measure of the extent to which the alkali added to the absorber reacts with SO_2.

Vacuum Filter - A mechanical continuous dewatering device, usually of a rotary drum design, which draws air and filtrate through a filter cloth coated with cake or sludge to be dewatered.

Valeric Acid - An organic acid produced by the degradation of dibasic acid in an absorber tower. Valeric acid can have a noticeably unpleasant odor.

Vanadium - This metal forms the active catalytic sites in the SCR catalyst where the reaction between the ammonia and NOx takes place.

Venturi - A cone-shaped device located at the top of each filter in pulse-jet collectors into which compressed air is blown. A negative pressure at the top of venturi is created to help pull additional volumes of air down into the filter element during pulsing.

Viscosity - The internal fluid resistance of a substance, caused by molecular attraction, which makes it resist a tendency to flow. Water has a low viscosity, tar has a high viscosity.

VOC - Volatile Organic Compounds

Voltage - The average DC voltage between the high voltage system and grounded side of the precipitator.

Vulcanization - A chemical process in which individual polymer molecules are linked to other polymer molecules by atomic bridges. The end result is that the springy rubber molecules become locked together to a greater or lesser extent. This makes the bulk material harder, much more durable and also more resistant to chemical attack. It also transforms the surface of the material from a sticky feel to a smooth soft surface which does not adhere to metal or plastic substrates.

Warp - The yarn running lengthwise (machine direction) in a woven fabric.

Warp count - Number of warp threads per inch of width.

Waste Product - Waste material that has little or no economic value and must be disposed.

Water Gauge (W.G.) - See "Inch of Water."

Watt-hour (Wh) - An electrical energy unit of measure equal to 1 watt of power supplied to, or taken from, an electric circuit steadily for 1 hour.

Weather enclosure - A non-gas tight enclosure on the roof of the precipitator to shelter equipment and maintenance personnel.

Weave - The pattern of weaving, i.e. plain twill, satin, etc.

Weft - Same as filling.

Weight (fabric) - The nominal weight per square yard of fabric. There is always a manufacturing tolerance on either side of this average weight, which may range from 3% to 8% depending on the product. Example: A 16 oz. (453.6 g) polyester felt has a weight tolerance + or - 1 oz. (28.5g).

Wet/Dry Interface - The zone at the absorber tower inlet where the hot flue gas first comes in contact with the slurry droplets.

Wet FGD - An FGD process comprised of contacting a sulfur oxide containing flue gas with a SO_2 sorbent liquid, saturating the flue gas, and producing a wet waste product or wet by-product.

Woof - Same as filling.

Wovens - Filter media fabrics constructed solely by weaving or interlacing yarns more or less at right angles into a uniform structure.

Yarn - A term for an assemblage of fibers or filaments forming a strand, which can be woven or otherwise formed into a textile material.

Yarn Size (Denier or Count) - A relative measure of fineness or coarseness of yarn. The higher the denier of a filament year, the coarser (heavier) the yarn is. Count is the number of yarns in a weave pattern per lineal inch.