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X. GLOSSARY

ACID GAS	A gas which, when dissolved in an ionizing liquid such as water, produces hydrogen ions. Carbon dioxide, hydrogen sulfide, sulfur dioxide, and various nitrogen oxides are the typical acid gases produced in coal gasification.
ANTHRACITE	"Hard" coal containing 86 to 98 percent fixed carbon and small percentages of volatile material and ash.
ASH	Theoretically, the inorganic salts contained in coal; practically, the noncombustible residue from the combustion of dried coal.
ASPHYXIAN	A substance capable of producing a condition due to lack of oxygen in respired air, resulting in impending or actual cessation of life.
BINDERS	Carbon products, tars, etc., used to impart cohesion to the body to be formed; a coal-extract binder may be used to prepare formed-coke pellets from non-coking coals.
BITUMINOUS COAL	A broad class of coals containing 46 to 86 percent fixed carbon and 20 to 40 percent volatile matter.
BLOW DOWN	Periodic or continuous removal of water containing suspended solids and dissolved matter from a boiler or cooling tower to prevent accumulation of solids.
BTU	British thermal unit, the quantity of energy required to raise the temperature of one pound of water one degree Fahrenheit.
CAKING	The softening and agglomeration of coal as a result of the application of heat.

CARBON-STEAM REACTION (WATER-GAS REACTION)	The reaction in which steam is passed over incandescent carbon to form a low-BTU gas consisting of hydrogen, carbon monoxide and carbon dioxide.
CARBONIZATION	Destructive heating of carbonaceous substances with the production of a solid porous residue, or coke, and the evolution of a number of volatile products.
CAVITATION	The formation and collapse of vapor cavities in a flowing liquid where the local pressure on the liquid is reduced to the liquid vapor pressure at that temperature. Collapse of these cavities produces objectionable noises and erosion on the adjacent surfaces.
CHAR	The solid residue remaining after the removal of moisture and volatile matter from coal.
CLAUS PROCESS	An industrial method of obtaining elemental sulfur through the partial oxidation of gaseous hydrogen sulfide in air followed by catalytic conversion to molten sulfur.
COAL	A natural solid material consisting of amorphous elemental carbon with various amounts of organic and inorganic compounds.
COAL GAS	The gas that comes from retorts, mufflers, or coke ovens during the distillation of coal. Large quantities of coal gas are produced when coal is used to make coke, coal tar, benzene, toluene, ammonia, and other products.)
COAL GASIFICATION	The reaction of coal at high temperatures in an atmosphere (reducing) deficient in oxygen to produce a combustible gas.
COKE	Porous residue consisting of carbon and mineral ash formed when bituminous coal is heated in a limited air supply or in the absence of air. Coke may also be formed by thermal decomposition of petroleum residues.

COKE OVEN GAS	The gas secured from coke ovens during the production of coke. (The properties of this gas are identical to those of coal gas, and the two products are interchangeable. Coke is particularly useful in making iron and steel and as an industrial fuel.)
CRUDE GAS	The impure gas produced in a gasifier.
DEVOLATILIZATION	The removal of a portion of the volatile matter from medium- and high-volatile coals.
DOG	Any of various usually simple mechanical devices for holding, gripping, or fastening.
ECONOMIZER	Heat exchanging mechanism for recovering heat from flue gases.
ELUTRIATION	The preferential removal of the small constituents of a mixture of solid particles by a stream of high-velocity gas.
ENTRAIN	To draw in and transport (as solid particles or gas) by the flow of a fluid.
FINES	In general, the smallest particle of coal or mineral in any classification, process, or sample of material; especially those that are elutriated from the main body of material in the process.
FIXED BED	A bed in which the individual particles or granules of a solid are motionless and supported by contact with each other (in contrast with moving bed).
FLASH DISTILLATION (FLASHING)	A continuous equilibrium vaporization in which all the vapor formed remains in contact with the residual liquid during the vaporization process. It is usually accomplished by the sudden reduction of pressure in a hot liquid.

FLUE GAS (STACK GAS)	Synonymous terms for the gases resulting from combustion of a fuel.
FLY ASH	A fine ash from the pulverized coal burned in power station boilers, or entrained ash carried over from a gasifier.
GAS LIQUOR (SOUR WATER)	The aqueous acidic streams condensed from the coal conversion and processing areas by scrubbing and cooling of the crude gas stream.
GASIFIER	A vessel in which gasification occurs, usually utilizing fluidized-bed, fixed-bed, or entrained-bed units.
GASWORKS	Plants built during the 19th and early 20th centuries to produce gas. Coal was generally burned in reducing atmosphere with steam to form a low-BTU gas. The hot gas was passed through a brick checkerwork at atmospheric pressure to heat the brick. When the brick was hot, the gas was switched to a second checkerwork and oil was sprayed into the first. The gas produced from the thermally cracked oil was added to the coal gas to form a medium (500-BTU) gas.
HIGH-BTU GAS	Fuel gas having an energy content of 950-1035 BTU/scf.
HIGHER HEATING VALUE (HHV) (GROSS HEAT VALUE)	The heat liberated during a combustion process in which the product water vapor is condensed to a liquid and the heat of condensation is recovered.
LEACHING	The process of extracting a soluble component from a mixture by percolating a solvent, usually water, through the mixture, resulting in the solution and eventual separation of the soluble components.
LIGNITE	Brownish-black coal containing 65 to 72 percent carbon on a mineral-matter-free basis, with a rank between peat and sub-bituminous coal.
LOW-BTU GAS	A gas having a heating value of up to 125-175 BTU per standard cubic foot.

LOCKHOPPER A mechanical device that permits the introduction of a solid into an environment at different pressure.

LOWER HEATING VALUE (NATURAL HEAT VALUE) The heat liberated by a combustion process assuming that none of the water vapor resulting from the process is condensed, so that its latent heat is not available.

MEDIUM-BTU GAS A gas having a heating value of 225-500 BTU per standard cubic foot.

METHANATION The catalytic combination of carbon monoxide and hydrogen to produce methane and water.

MOVING BED A body of solids in which the particles or granules of a solid remain in mutual contact, but in which the entire bed moves in piston-like fashion with respect to the containing walls (in contrast with fixed bed).

NATURAL GAS Naturally occurring gas extracted from sedimentary structures, consisting mainly of methane and having a higher heating value of approximately 1,050 BTU per standard cubic foot.

NONCAKING GAS A coal that does not form a cake under normal conditions.

ON-STREAM OPERATING TIME The time during which the entire plant is actually working at preset conditions, as opposed to the time in which it is shut down for repairs, starting up, etc.

PILOT PLANT A small-scale industrial process unit operated to test the application of a chemical or other manufacturing process under conditions that will yield information useful in design and operation of full-scale manufacturing equipment.

POKEHOLE An opening in the cover of a process vessel through which steel rods are inserted, for the purpose of determining the fire bed depth and the ash bed depth in a gasifier.

PROCESS STREAM Any material stream within the coal conversion processing area.

PRODUCT STREAM Streams within the coal conversion plant that contain the material which the plant was built to produce.

QUENCHING Cooling by immersion in oil, water bath, or water spray.

RANK Those differences in the coals due to geological processes designated as metamorphic, whereby the carbonaceous materials change from peat through lignite and bituminous coal to anthracite or even to graphite; the degree of coal metamorphism.

RAW GAS Impure gas produced in a gasifier.

REAL TIME The actual time during which an event takes place with the reporting on or recording of the event simultaneously with its occurrence.

SLUDGE A soft mud, slush, or mire, eg, the solid product of a filtration process before drying.

SOUR GAS A gas containing acidic substances such as hydrogen sulfide or carbon dioxide.

SOUR WATER See gas liquor.

SPARED EQUIPMENT Standby, parallel equipment that is available for immediate use by switching power or process from on-stream equipment.

STUFFING BOX A device that prevents leakage from an opening in an enclosed container through which a shaft is inserted.

SUB-BITUMINOUS COAL Coal of intermediate rank (between lignite and bituminous); weathering and nonagglomerating coal having calorific values in the range of 8,300 to 11,000 BTU, calculated on a moist, mineral/matter-free basis.

SWEET GAS Gas from which acidic constituents such as H₂S have been removed.

SYNTHETIC NATURAL GAS (SNG)	Substitute natural gas; a manufactured gaseous fuel generally produced from naphtha or coal that contains 95% to 98% methane and has an energy content of 980 to 1,035 BTU/scf (about the same as that of natural gas).
SYNTHESIS GAS	A mixture of hydrogen and carbon monoxide which can be reacted to yield hydrocarbons.
TAIL GAS	A gas issuing from a gas-treatment unit which may be recycled to the process or exhausted.
TAR	A brown or black viscuous combustible liquor formed by the destructive distillation of coal. It condenses out of the raw gas stream as part of the gas liquor, has a specific gravity of approximately 1.1, and contains most of the fines which are carried over from the gasifier in the gas stream.
TAR OIL	The more volatile portion of the tar, with a specific gravity of approximately 0.9, a boiling range of approximately 185 to 300 C (365 to 660 F) depending on the coal feed and operation conditions. In addition, tar oil floats on the gas liquor.
TOXICANT	A substance that kills or injures an organism through chemical or physical action, or by altering the organism's environment.
TRACE ELEMENTS	The term "trace elements" is applied to elements that are present in the earth's crust in concentrations of 0.1% (1000 ppm) or less. Trace element concentrations are usually somewhat enriched in coal ash. Environmentally hazardous trace elements present in coal include: antimony, arsenic, beryllium, cadmium, mercury, lead, selenium, and zinc.
VENTING	Release of gases or vapors under pressure to the atmosphere.