

Oil and Gas Terms:

A

Accumulation: Quantity of hydrocarbons (oil and natural gas) found in the reservoir rock in an oil or gas field.

Alkylation: A chemical reaction that consists in fixing an alkyl radical onto a molecule.

Appraisal well: A well drilled in order to evaluate the characteristics of a field.

Assisted recovery: Set of techniques for increasing the productivity of a field.

Associated gas: Gases present in the reservoir rock.

B

Ballast tank: A tank intended to be filled with seawater to keep floating equipment stable.

Barrel: Unit of volume of crude oil in use in the oil industry, especially in the USA and the UK. Dates back to the days of sailing ships, when oil was shipped in casks.

Bit: Tool used in drilling to break up rock mechanically in order to penetrate the subsoil gradually. The bit will dig a circular hole.

Blowout preventer : Safety system that quickly closes a well in the course of drilling, to avoid accidental blowouts.

C

Casing: Set of steel tubular elements used to line the inner wall of a drill hole, to consolidate it. The casing is secured by cementing the annular space between the hole wall and the casing. Each time a tubing is installed, the well diameter is reduced, so that the tubing in a well forms a telescopic assembly. The tubes have a standard length of nine meters, and are assembled by threaded sleeves.

Catalysts: Chemical compounds that facilitate or promote a reaction by their presence or action.

Catalytic cracking: This conversion operation takes place at very high temperatures (500 degrees Celcius) in the presence of a catalyst. It serves to break up large hydrocarbon molecules into smaller ones.

Cat feed: Those products of the crude distillation process which are further refined through catalytic cracking.

Cementing: Injection of cement into the annulus (space) between the casing and the well wall to consolidate the latter and reduced water influxes.

Christmas tree: Another name for a wellhead.

Coke: A solid material similar to coal that can be produced from processing of heavy oil.

Coking: A refining process by which the denser, heavier products of the distillation process (residuals) are converted to lighter products such as cat feed and naphtha, and petroleum coke, a solid, coal-like fuel. The coking unit, or coker, heats hydrocarbons to near 800 degrees Fahrenheit, at which temperature all the lighter products vaporize and the coke solidifies in a large drum called a coke drum from which it is removed by means of high-pressure jets of water.

Completion (well): All operations (tubing, installation of valves, wellhead, etc.) to bring a production well into operation.

Conversion: This stage in the refining process consists of breaking up the large molecules into smaller ones in order to produce lighter compounds. Processes involved include catalytic cracking and viscosity reduction (visbreaking).

Cooling tower: A structure which cools heated refining process water by circulating the water through a series of louvers and baffles through which cool air is forced by large fans.

Core-sampling (or coring): During drilling, cylindrical samples of rock known as "core samples" are removed in order to study the characteristics of the terrain.

Crude oil: A mixture of thousands of chemicals and compounds, primarily hydrocarbons. Crude oil must be broken down into its various components by distillation before these chemicals and compounds can be used as fuels or converted to more valuable products. Crude oil is classified as either sweet crude (sulfur content less than 0.5%) or sour crude, (at least 2.5% sulfur).

Crude unit: The refinery processing unit where initial crude oil distillation takes place. See topping.

Cut: One or more crude oil compounds which vaporize and are extracted within a certain temperature range during the crude distillation process. See distillation curve.

D

Derrick: Metal tower erected vertically above a well for the purpose of lifting and lowering tubes and tools into the well.

Derrick-man: Member of the drilling crew who works at the top of the derrick.

Desalting: Removal of salt from crude oil. Desalting is preferably performed prior to commercialization of the crude, and must be performed prior to refining.

Development: All operations and measures undertaken to bring a reservoir into production.

Diamond-tipped (tools): Drill-bit or other tool whose cutting-edge has been hardened with manmade diamonds.

Directional drilling: The most common drilling direction is vertical, but there may be various reasons for drilling obliquely.

Distillation: The first step in the refining process. During distillation, crude oil is heated in the base of a distillation tower. As the temperature increases, the crude's various compounds vaporize in succession at their various boiling points, then rise to prescribed levels within the tower according to their densities, condense in distillation trays, and are drawn off individually for further refining. Distillation is also used at other points in the refining process to remove impurities.

Distillation curve: A graph which plots the percentage (by volume) of a given grade of crude which boils off as a function of temperature. Since the boiling points of the various crude cuts are constant, the distillation curve shows the percentage of each compound in a given grade or batch of crude.

Distillation tower: A tall column-like vessel in which crude oil is heated and its vaporized components distilled by means of distillation trays. Also used to remove impurities added during the refining process.

Drill: Making a hole by means of whatever mechanism.

Drill string: Set of drilling tools, comprising pipes connected to each other, the bit, and the different tools. In drilling, the drill string is rotated by the rotary table.

Drilling mud: Mixture of water and special additives circulating within the well for the purpose of cooling the drill-bit, removing rock cuttings and transporting them back up to the surface, preventing the well wall from caving in, maintaining sufficient pressure at the well bottom to avoid hydrocarbon blowout.

Drum cycle: In the petroleum coking process, the length of time it takes to heat the coke drum sufficiently to safely introduce hot hydrocarbons, transform the raw material into solid petroleum coke, and remove or cut the solid coke from the drum before repeating the process. The shorter the drum cycle, the more economical the coke manufacturing process.

E

Echosounder: Device used to calculate the distance of an obstacle based on the time a soundwave takes to travel to the obstacle and back.

Effluent: Mixture of oil, gas, water and sand discharged from a well.

Electron: An elementary particle carrying a negative electric charge. An electron's mass is negligible compared with that of protons and neutrons.

Enhanced recovery: Recovery techniques designed to extract more hydrocarbons from a reservoir by physical, chemical or thermal means.

Exchanger (Heat exchanger): Any device used to transfer heat from one process liquid to another. In one kind of exchanger, process hydrocarbons are circulated through tubes surrounded by cooling air or water.

Exploration: Any method used to discover new oil and gas fields.

Exploration well: Well drilled to find an oil field.

F

Field: Set of porous rocks containing hydrocarbons.

Flare bleeder: Device for evacuating and burning unused gases.

Fractionation: The separation of crude oil into its more valuable and usable components through distillation.

G

Gas cap: Upper portion of reservoir rock of a gas-containing field. The gas extracted during oil production is sometimes injected into the gas cap in order to boost hydrocarbon recovery.

Geophone: Acoustical sensor for collecting reflected waves, in seismic exploration.

Gravity: a property of a material that compares its weight to its volume.

H

Heat exchanger: See exchanger

Horizontal drilling: Extreme form of directional drilling, in which the hole is drilled along a horizontal stratum.

Hydrocarbon: Chemical compound formed only of carbon and hydrogen.

Hydrophone: Acoustical sensor used for collecting reflected waves in seismic exploration at sea.

I

Injection well: Well used to inject water or gas, in order to maintain a field at pressure or bring it back under pressure.

J

Jacket: Steel structure placed on the seabed with a deck supporting drilling and/or production facilities.

Jet fuel: A fuel used in aircraft. Jet fuel is obtained by distillation and sweetening. The latter removes all trace of mercaptans (very light molecules containing sulfur atoms). Jet fuel is a white product, so-called because it is transparent.

K

Kick-off (deflected) well: Well whose orientation and inclination are determined to reach an area not directly below the well.

L

Loading flange: Installations required to deliver crude oil to a refinery.

Lubes (Lubricants): Denser, more viscous refined products such as motor oil, bearing grease or machine oil.

M

Manifold: Set of pipes and valves directing the effluent or production into facilities.

Mantle: Impermeable stratum overlaying a reservoir which prevents the hydrocarbons contained in it from migrating to other rocks.

Mantle : The part of the earth between the crust and the central core.

Mercaptan: Molecules containing sulfur, with a low molecular weight and therefore very light.

Mother (or source) rock: Rock in which hydrocarbons are formed.

MTBE: Methyl tertiary butyl ethane is a gasoline additive which increases octane rating.

MTBF: Mean time between failures is the average service life of a piece of process equipment, particularly for rotating equipment. A refinery's MTBF is one indicator of the effectiveness of its maintenance program.

N

Naphta: An oil distillate. Naphta is an intermediate product between gasoline and kerosene. It is known as a light product because of the low molecular weight of the hydrocarbons making it up.

O

Octane number: In a gasoline-powered engine, combustion is triggered by a sparkplug. Given the high pressure and temperatures prevailing inside the combustion chamber, it is vital to prevent the fuel from igniting spontaneously. The octane number measures a fuel's resistance to spontaneous ignition. The higher the octane number, the greater fuel's resistance to spontaneous ignition.

Offshore: Designates oil fields and facilities constructed at sea.

Oil-bearing reservoir: Continuous volume of rock containing voids, pores, or a network of cracks, and in which fluids (hydrocarbons, water, and inert gases) can circulate.

P

Petrochemicals: Chemicals produced from petroleum. They are often manufactured as part of the refining process.

Petroleum: From the Latin *petra oleum*, meaning "stone oil", an inflammable oily liquid varying in color from yellow to black, consisting of widely varying hydrocarbons, found in sedimentary strata of the earth's crust.

Platform: Set of facilities rising above the sea, used to operate offshore fields.

Porosity: Ratio of the volume of interstices of a material to the volume of its mass. In oil fields, the oil and gas are contained in pores in the rock.

Production sharing agreement: Contract by which the production of a field is shared between the host government and the oil company operating the field. The company is paid in the form of cost oil, to cover the exploration and development expenses borne by it alone, and profit oil, which represents its profit on the venture.

Production well: Well used when producing oil.

Prospect: Underground area in which geologists think there is a chance of finding oil.

R

Reboiler: A special kind of heat exchanger used to put heat into a distillation column.

Refinery: Plant where crude oil is separated and transformed into marketable products.

Reforming: A refining process wherein short-chain molecules in certain crude distillation products are chemically recombined (reformed) by means of heat, pressure, and usually, catalytic reaction to form higher-value long-chain-molecule compounds.

Reserves (of a field): Volume of oil trapped in a rock.

Reservoir characteristics: All of the features that serve to characterize the hydrocarbons (viscosity, density, etc.) and the rock containing them (porosity, permeability, etc.).

Rotary: Drilling method consisting of drilling rocks with bits turning about their axis. The rocky debris is continuously evacuated to the surface by a flow of mud under pressure.

Rotary table: Circular plate in a drilling rig that transmits the rotational motion to the drill pipes through the drive pipe.

S

Sample: Small quantity of rock removed, often by coring, for analysis.

Sediments: Deposits of particles of variable sizes, coming either from the erosion of old rocks or from activities (shellfish shells or other). With time, the sediments become sedimentary rock.

Sedimentary basin: Terrain consisting of superposed layers of rock formed from the deposition of sediment over vast tracts of ocean or lake beds, over the course of geological eras.

Sedimentary rock: Rock made up of aggregated sediments.

Seismic analysis: The seismic principle is to generate elastic waves methodically and study their propagation through the subsoil. The seismic waves are refracted and reflected as they travel through the various rock strata, and are detected at the ground or sea surface by appropriately placed geophones. The seismic records are interpreted to generate information concerning the shape of the underground strata in the explored region.

Self-raising platform: An offshore drilling platform fitted with large buoyancy tanks which are filled with seawater to keep the rig stable in the sea swell.

Separation: The first stage in refining, consisting in separating the different hydrocarbons present in the crude oil depending on their respective boiling ranges. This process takes place in a distillation column.

Separator: Apparatus that separates oil, gases, and water contained in the effluent at the exit from a production well, by making use of their relative densities.

Slot: Element of a drill shirrtail for guiding the drill tube.

Sounding well: Hole for obtaining data concerning the characteristics of a field.

Sour crude: Crude oil containing a substantial amount of sulfur.

Strata: Layers of rock making up a terrain.

Stratum of a terrain: Mineral deposits in superposed layers.

Stripping: A separation process that consists in injecting water steam into the distillation residue in order to recover the lightest molecules.

Subsoil: Part of the earth's crust located below the surface.

T

TAME: Tertiary amyl methyl ethane is a gasoline additive which increases octane rating.

Topping (Atmospheric distillation): The initial transformation of the crude oil at a refinery. The topper heats crude oil at atmospheric pressure to accomplish the first rough distillation cut. The lighter products produced in this process are further refined in the catalytic cracking unit or the reforming unit. Heavier products which cannot be vaporized and separated in this process are distilled still further in the vacuum distillation unit or the coker.

Tray: Flat, perforated shelves at prescribed levels in a distillation tower, which allow specific vaporized crude oil components to pass through and then condense on their surfaces (after contacting domes called bubble caps above the perforations) before being drawn off for further distillation.

Treatment: Set of procedures for separating the various components of the effluent and obtaining crude oil.

Tubing: Set of steel tubular elements in the center of the well, by which the effluent is evacuated to the surface.

Turnaround: Scheduled large-scale maintenance activity wherein an entire process unit is taken offstream for an extended period for comprehensive revamp and renewal.

V

Vacuum distillation: Process by which heavier cuts of crude not vaporized in the topping process are heated in a vacuum to accomplish their fractionation.

Vent: Gas safety exhausting system to avoid dangerous excess pressures building up.

Visbreaking: This is a thermal cracking process. Like catalytic cracking, it breaks up large molecules into smaller ones. It is applied to the residue of vacuum distillation as part of the overall conversion process.

Viscosity: The ability of a liquid to flow at a given temperature.

Volatility: The ability of a liquid to evaporate.

W

Well: Hole drilled underground for oil exploration and operation. By extension, any apparatus used for this purpose.

Wellhead: All connections, valves, nozzles, pressure gages, thermometers, and so forth, installed at the exit from a production well.

Well-logging: Electrical recording of physical characteristics of rocks traversed by a well.

White product: A term used to refer the lightest products resulting from the refining process, because of their transparent appearance.

Reference: http://www.flowmeterdirectory.com/oil_gas_terms.html