IADC WELLSHARP

WellSharp® Definitions Reference Document

The definitions provided below are for terms typically used in well control operations, and are the official term meanings used in the IADC WellSharp® Knowledge Test.

Abnormal Pressure	Reservoir pore fluid pressure that is greater than the hydrostatic pressure of a full column of water or brine with salinity normally found in the local formation.
Active Pits	A component of the mud storage system that is an active part of the circulation system. These pits are monitored for downhole losses and gains. The suction pit feeds the mud pumps, and the returns from the well go to the return pit. In small systems, both suction and return can be the same pit.
Advisory Status (Watch Circle)	Requires Risk Assessment, continue operations with mitigations returning to Green, or escalate to Yellow.
Air Gap	The clearance between the highest water surface that occurs during the extreme weather conditions and the underside of the platform/hull deck.
American Petroleum Institute (API)	The American Petroleum Institute (API) is a trade association sponsored by the oil and gas industry and recognized worldwide for setting industry standards and recommended practices.
Annular Pressure Loss (APL)	Pressure loss caused by the flow of fluid up the annulus (also referred to as annular friction loss).
Autoshear	A safety system that is designed to automatically shut in the wellbore in the event of a “disconnect” of the LMRP. When the Autoshear is engaged, disconnecting the LMRP closes the shear rams.
Backpressure Valve (BPV)	A valve that only allows flow in one direction. Commonly installed as a barrier to pressure from downhole.
Balance / Underbalance / Overbalance	A state of pressure differential between static or circulating mud pressure on the formation and the formation fluid pressure. Balance occurs when pressure exerted on the formation is equal to the formation fluid pressure. Underbalance occurs when the pressure exerted on the formation is less than the formation fluid pressure. Overbalance occurs when the pressure exerted on the formation is greater than the formation fluid pressure.
Balance Point / Neutral Point	The transitional point between pipe light and pipe heavy.

Ballooning (Formation)	Well ballooning is caused by the loss of drilling fluid into the formation when the equivalent circulating density (ECD) exerted on the wellbore is nearly equal to the formation equivalent fracture pressure. When the pumps are turned off, ECD is lost and the fluid returns to the wellbore from the formation. The rate of return will vary with the formation, and the returning fluid may be contaminated with formation fluids. At the surface, this process appears as losses while drilling and gains while making connections or tripping (also referred to as wellbore breathing, supercharging, or micro-fracturing).
Ballooning (Tubular)	The tendency of tubulars to expand to an increased diameter at some point when subjected to excessive compressional stress and/or internal pressure.
Barrier	Barriers are used to manage flow from the formation and reduce the risk associated with drilling, completion, production, and intervention activities.
Barrier Element (Well Barrier Element-WBE)	A single, dependent component or practice that contributes to the total system reliability.
Barrier Envelope (Well Barrier)	One or several well barrier elements that control fluids within a well, acting in a series to prevent uncontrolled flow.
Bit Balling	Term used to describe soft, sticky clay formations that stick to the bit (and stabilizers) and impede drilling. The balling effect can also increase swab and surge pressures.
Blow Through	A situation that can occur in an atmospheric mud-gas separator (MGS) when the pressure generated inside the separator and associated vent line exceeds the hydrostatic pressure created by fluid in the separator U-tube (dip tube). This can result in well fluids in the gaseous state being “blown through” the MGS to the shale shaker area in a gaseous state. This affects fluid properties and can be hazardous if the shale shaker area is enclosed.
Blowout	An uncontrolled exit of formation fluids at the surface or mud line.
Blowout Preventer (BOP)	The BOP stack is a critical safety device used in well construction operations. Its primary function is to prevent the uncontrolled release of wellbore fluids from the well.
Bottomhole Assembly (BHA)	Lower portion of the workstring consisting of tools and/or equipment, such as mills, reamers, drill collars, jars, necessary for the ongoing/forward operation.
Bottomhole Pressure (BHP)	The sum of all the pressures acting on the wellbore at total depth.

Bottoms-Up	The circulation of the mud column, measured from the bottom of the well to surface. Often referred to when collecting samples or cleaning the wellbore before drilling ahead.
Bridging Document	Document that aligns and coordinates the requirements and responses of various parties in relation to a specific aspect of a project. Commonly used to align and coordinate the emergency response procedures for owner and contractors.
Brine Saturation Point	Maximum amount of a particular salt or mineral that can be dissolved in a given volume of brine at a specific temperature, pressure, and circulation/agitation to keep fluid at a constant weight. When a brine reaches its saturation point, any additional salt or mineral added will no longer dissolve and will instead precipitate out of the solution, often forming solids like scale or crystals.
Broaching	The venting of fluids to the surface or to the seabed through channels external to the casing.
Bulk Density	Dry weight of unit volume.
Bullheading	The pumping or squeezing of fluids into the well against pressure in order to force back the formation fluids into the formation in order to kill the well.
Bumping Float	An operation to determine shut-in drillpipe pressure that cannot be determined until a “float” in the drillstring is opened.
Buoyancy	The effect of the mud density on the immersed weight of the drillstring.
Capping	The process of installing a capping stack and shutting in a well.
Carbon Dioxide (CO_2)	A hazardous, odorless, and corrosive gas with a chemical composition of Carbon and Oxygen, which is highly soluble in water and oil especially under pressure.
Cased Hole	The wellbore intervals in a well that are cased with casing and/or liner pipe. The diameter of these hole sections is the inside diameter of the pipe contained therein.
Casing	The steel pipes that are inserted into a drilled hole used to line the wellbore. This helps to stabilize the well preventing the wellbore walls from collapsing, prevents contamination of water sands, and isolate different pressure zones.

Cavings (Heaving or Spalling Shale)	A large, sometimes splinter-shaped piece of formation (usually shales) that has “caved-in” or fallen from the hole wall due to increasing formation pressure or reduced wellbore stability. Often referred to as large splinter-shaped cuttings, but not technically a cutting from the bit action. May also be referred to as heaving or spalling shales.
Choke	A device with either a fixed or variable orifice installed in a line to restrict and control the flow of fluids and gas.
Choke Exercise	Choke exercise used in snubbing operations to demonstrate choke operator proficiency in flow control.
Choke Line Friction	Friction generated by circulating mud along the choke line. Same effect applies to the kill line.
Choke Manifold	An assembly of valves, chokes, gauges, and lines used to control the rate of flow from the well when the blowout preventers are closed
Choke Pressure	The pressure resulting from the restriction of flow downstream. It occurs when fluid is forced through a small opening or orifice (choke). Under dynamic conditions, the choke pressure creates a surface pressure that is imposed on all points in the circulating system, including the bottom of the hole (also called backpressure).
Closing Ratio	The ratio of the cross-sectional area of the ram's piston (or cylinder) exposed to the close operating pressure, to the cross-sectional area of the ram shaft exposed to wellbore pressure.
Completion	Activities that prepare a well for the initial production of oil and gas; the process of establishing a flow path for hydrocarbons between the reservoir and the surface. Examples of completions include openhole, cased-hole perforated, single-string, dual-string, and gravel-packed completions, or other processes, such as injection.
Completion Fluids	Any fluid—used during completion or workover operations—of sufficient density to control formation pressure. Generally, it is low-solids or solids-free fluid used to minimize formation damage.
Compressibility	The relative change in fluid volume related to a unit change in pressure and temperature. Gas has a higher compressibility than liquid.
Compressible Fluid	General term applied to non-aqueous fluids (oil or synthetic) that exhibit a mud density increase with increasing pressure. The result can be a greater hydrostatic pressure on bottomhole than expected based on measurements of surface mud density.

Constant	A term used to describe a number that is inserted into an equation to convert elements of the equation to a common unit. For example, 0.052 allows the different units of ppg and feet to be used to calculate a pressure in psi.
Converting the Casing Float Collar	An operation to close a float collar that has been held open during the running of casing in the hole. Flow rate and pressure are increased to the manufacturer's recommendation to release the auto-fill device and allow the casing float valve(s) to close.
Crossover	A connector with a different diameter and/or connection at each end.
Cuttings	Formation pieces that break away due to the action of the bit teeth. Cuttings are screened out of the liquid mud system at the shale shakers and monitored for composition, size, shape, color, texture, hydrocarbon content, and other properties by the mud engineer, the mud logger, or other on-site personnel.
Dart Valve	A spring-loaded device that serves as a type of inside BOP. The dart valve is dropped into the drillpipe and becomes seated at the bottom. Fluid can be pumped through the device, but it is designed to prevent a kick from flowing back up the drillpipe. (It is also called a drop-in check valve.)
Dead well	Well that is(will) not flow(ing) when open to atmosphere at the surface.
Deadman	A buried anchor or holding device installed in the ground to which guy wires are attached to steady the derrick, mast, stacks. The "Deadman anchor" is a common term to define the fixed end of the drilling line.
Differential Pressure	Difference in pressure between two given points within the same system, with applications across various processes and equipment. It's a measurement used to monitor various aspects of well operations, including flow rates, level detection, and pressure control. Often denoted as ΔP.
Displacement	The volume of steel or fluids in the tubulars and devices inserted and/or withdrawn from the well bore.
Diverter	A device attached to the wellhead or marine riser used to direct flow away from the rig. A diverter, often used to control shallow flows, closes the vertical flow path and allows the well to flow through a side outlet and diverter line.

Downhole Mud Weight (DHMW)	The pressure applied by the static column of mud at a point in the wellbore, expressed in the same units as the mud weight (MW). It is typically measured in pounds per gallon (ppg), pounds per cubic foot (lb/ft^3), or grams per milliliter (g/mL). This pressure is different from MW as measured at surface as it includes effects associated with the presence of mud in the wellbore, such as thermal effects, compressibility effects, and cuttings loading.
Driller's Method	Kill method that involves first circulation out the influx and secondly circulation kill mud around the well.
Drilling Break	A significant increase or decrease in the rate of penetration that is sustained for an agreed number of feet. The "break" will represent a change in formation downhole that may result in losses or gains. Commonly used criteria are a 50% change in rate of penetration sustained over five feet.
Drilling Fluids	A liquid or slurry pumped down the drillstring and up the annulus primarily during the drilling operation. One function is to provide sufficient differential pressure against exposed permeable formations. Drilling fluid can be air, gas, water, oil, synthetic fluid, or a combination of these. Drilling fluid is also referred to simply as "mud."
Drilling Window	The difference between the maximum pore pressure and the minimum effective fracture pressure. It can be determined for any point within an openhole interval. Drilling margin is usually expressed in terms of equivalent mud weight.
Drills (Pit, Trip, Strip, Choke, Abandon, Diverter)	Well control drills carried out by crewmembers to ensure positive and effective reaction to a well control situation. Pit drill involves recognizing and reacting to a change in pit level. Trip drill involves recognizing and reacting to a kick while tripping. Strip drills allow the crew to practice stripping in or out of the hole. Choke drills allow crewmembers to practice choke operations with the well under pressure. Abandon drills are generally a part of regular rig drill that involves evacuation to a safe position (especially in the case of H_2S) or to the lifeboat stations (offshore). Diverter drills allow the rig floor crew to practice diverting procedures and immediately following actions.
Dynamic Barrier	A barrier that may change effectiveness over time and requires constant monitoring and maintenance. This is measured typically with some dynamic management process accounting for potential degradation.

Dynamic Kill	A term that is used for a well control technique that involves using friction losses as additional pressure (ECD) to the well to overcome an “underbalanced” condition.
Dynamic Pressure Control Devices (DPCD)	Dynamic seal to contain fluid and pressure escaping from the wellbore (e.g., stripper). DPCD must have an additional pressure sealing barrier below equipment and in direction of flow.
Emergency Closure	Activation of a barrier or pressure control device in an emergency.
Emergency Disconnect System (EDS)	The operation of securing the well and then unlatching of the riser connector to separate the riser and LMRP from the BOP stack.
Emergency Shut Down (ESD)	Controlled sequence of events that ensures that the well is secured against accidental release of hydrocarbons into the environment (i.e., closing of barrier elements).
Equalizing Loop	The equalizing loop consists of high-pressure piping and valves configured around the stripping rams of a snubbing unit. Its primary function is to enable wellhead pressure to be applied on both sides of the rams when they are closed, to cycle collars or tool joints into and out of the wellbore. This equalization of pressure is necessary before the rams can be safely opened.
Equivalent Circulating Density (ECD)	The effective density of the circulating fluid in the wellbore resulting from the sum of the hydrostatic pressure imposed by the static fluid column and the circulating friction pressure.
Equivalent Mud Weight (EMW)	A pressure exerted at a specific depth and expressed as density of a static column of fluid that would create the same pressure at that depth.
Eutectic Point	The lowest possible freezing point that can be achieved for a given mixture of substances. In the case of brines, it's the lowest temperature at which a specific combination of salts and water can remain liquid.
Freezing Point	Is the temperature at which a liquid turns into a solid. For water, this occurs at 32°F (0°C) under standard atmospheric pressure.
Final Circulating Pressure	The calculated pumping pressure to achieve when circulated kill mud reaches the bit. Used in the Wait and Weight method.

Fingerprinting	A technique used to establish “normal” circulating conditions and compare with current conditions to see if the well has any stability issues (flowing or losses). For example, measuring flowback at connections to determine if well is ballooning or kicking.
Flow Check	An observation performed on a static well to 1) verify stable well conditions; 2) assess the integrity of a plug, valve, or flow-control device; or 3) identify possible/suspected loss of hydrostatic overbalance during well operations.
Fluid Barrier	Hydrostatic column of fluid capable of overcoming pore pressure at any given depth. Must be continuously monitored and maintained for density and vertical height.
Formation Fluid Pressure (Pore Pressure)	The pressure exerted by fluids in the rock pore spaces. Knowledge of formation pressure helps determine the hydrostatic pressure and mud weight required to drill the well. If the formation pressure is greater than the hydrostatic pressure, formation fluids may flow into the well from permeable formations (also called pore pressure, reservoir pressure, or shut-in bottomhole pressure).
Formation Integrity Test (FIT)	The application of pressure on the formation by superimposing a surface pressure on a fluid column to verify the ability of a subsurface zone to withstand a certain hydrostatic pressure.
Forward Circulation (Conventional Method)	Pumping fluids down the tubing and have returns up the casing tubular annulus. An application of this method involves circulating out the influx on the initial circulation.
Fracture Gradient	The pressure gradient (measured in psi/ft or kPa/m) at which the formation will fracture and the formation has changed.
Fracture Pressure (Drilling Operations)	The pressure exerted on a formation that causes the formation to fracture and take fluid. The fracture may be permanent or may close once pressure is released.
Fracture Pressure (Well Servicing)	The pressure exerted on a formation that causes the formation to fracture and propagate. The fracture may be permanent or may close once pressure is released.
Gas Migration	The upward movement of gas in the drilling fluid. Movement occurs due to gas being lighter than the drilling fluid.
Gas-Cut Mud	Drilling fluid that is contaminated with gas, causing a small reduction in the effective mud weight.
Geological Seal	Geological feature with low permeability that impedes the movement of hydrocarbons from the reservoir.
Guide Tube	Travels up and down with the traveling assembly and prevents local pipe buckling during snubbing (pipe light) conditions.

Hang-Off	Following shut in on a subsea well, the pipe tool joint is suspended on a closed ram.
Heaving Shale	See Cavings.
High Pressure High Temperature (HPHT)	Wells with a potential pressure greater than 15,000 psi / 103 MPa / 1,034 bar at the wellhead or with a potential flowing temperature of greater than 350°F (177°C) at the wellhead.
Hydrate	A solid, crystalline compound of water and a low-boiling-point gas (e.g., methane and propane), in which the water combines with the gas molecule to form a solid. They are formed under reduced temperature conditions and elevated (high) pressure conditions, can impede fluid flow, and resemble snow or ice.
Hydraulic Workover Unit (HWO)	A workover rig that uses a hydraulic jack instead of a draw works to convey the pipe. Utilized only on dead wells.
Hydrogen Sulfide (H_2S)	A toxic poisonous gas with a chemical composition of Hydrogen and Sulfur which is sometimes found mixed with and produced with fluids from oil and gas wells.
Hydrostatic Pressure	Pressure exerted by a column of fluid at rest. It increases directly with the density and the depth of the fluid and is expressed in pounds per square inch.
Inflow/Negative Test	A test on a barrier element in which the hydrostatic pressure is reduced such that the net differential pressure direction is from the formation into the wellbore.
Initial Circulating Pressure (ICP)	Drillpipe pressure required to circulate initially at the selected kill rate; numerically equal to kill-rate circulating pressure plus closed-in drillpipe pressure. Minimum pressure needed to maintain a constant BHP during well kill operations.
Injection Pressure (Well Servicing)	Total pressure applied to the formation to overcome the pore pressure and the frictional forces (permeability) of the formation that will allow the injection of fluids back into the formation.
Inside Blowout Preventer (IBOP)	A device installed in the drillstring that acts as a check valve allowing drilling fluid to be circulated down the string but prevents backflow (also called an internal blowout preventer).
Kick	An unplanned and unintended flow of formation fluids from the reservoir into the wellbore. It occurs when the pressure exerted by a column of fluid is less than the pressure exerted by the formation fluids.
Kick Intensity	The difference between the maximum anticipated pore pressure and current/planned mud weight.

Kick Tolerance	A calculation used during well planning to determine the maximum kick volume that can be taken into the well and circulated out without causing formation damage. Dependent upon depth (usually the casing shoe) and kick intensity.
Kill Log	Data that is recorded at regular intervals during the kill procedure that creates a log of events. Recordings are commonly made at stroke intervals, and the data includes, but is not limited to, surface pressures, pit levels, choke opening size, strokes per minute, and comments, etc. Also referred to as “Recorded Kill Data.”
Kill Schedule	Calculated sequence of events (volumes and pressures) implemented during a well control/well intervention procedure.
Kill Weight Mud	Drilling fluid with sufficient density to provide hydrostatic overbalance and regain primary well control.
Lag Time	The time lapse that occurs between a surface pressure change on one side of a wellbore (U-tube) and the resulting pressure change on the other side.
Leakoff Test (LOT)	Application of incremental surface pressure on a fluid column to determine the pressure at which the exposed formation accepts fluid. Pressure is applied to a closed system and used to determine the fracture strength of an open/exposed formation.
Liner	A casing string that does not extend to the top of the well or to the wellhead. Liners are anchored or suspended (hang-off) from inside the previous casing string using a liner hanger. The liner can be fitted with special components so that it can be connected or tied back to the surface at a later time. Other applications can include casing liners, production liners, tie-backs, repairs, patches, etc.
Live Well	Well will flow if open to the atmosphere. (BHP is hydrostatically underbalanced with wellbore fluids.)
Lube and Bleed	A well control technique that replaces an influx, located immediately below the BOP, with drilling fluid. It involves repeatedly pumping in small quantities of kill mud into the wellbore and then bleeding off excess pressure. It works on the principle that the heavier kill mud will sink below the lighter wellbore fluids and so bleeding off the pressure will remove the latter leaving an increasing quantity of kill mud in the wellbore with successive steps.

Lubricator Extension (Riser)-Wireline	An extended length of tubular beneath the wireline ram assembly to allow a working height and stability for wireline PCE. Must have the same pressure rating, metallurgy, and minimum inside diameter as the wireline PCE.
Managed Pressure Drilling (MPD)	An adaptive drilling process used to more precisely control the annular pressure profile throughout the wellbore.
Maximum Allowable Annular Surface Pressure (MAASP) / Maximum Allowable Casing Pressure (MACP)	A calculated value for casing pressure that, if exceeded, may result in fluid loss to the formation at the casing shoe (formation fracture) or casing burst (also called maximum allowable casing pressure (MACP)).
Maximum Allowable Mud Weight (MAMW)	A calculation to determine the maximum allowable mud weight based on the leakoff / formation integrity test data.
Maximum Allowable Operating Pressure (MAOP)	The highest pressure that a given equipment component will be subjected to, based on a pressure test, during the execution of the prescribed service and/or during a contingency operation. The MAOP may be equal to or greater than the MASP but less than or equal to MAWP.
Maximum Allowable Working Pressure (MAWP)	Maximum allowable working pressure rating for a wellhead, production tree, tubular, barrier, or other pressure equipment.
Maximum Anticipated Surface Pressure (MASP)	The highest pressure predicted to be encountered at the surface of the well. The formation pressure minus the hydrostatic pressure of the native fluids. In a “worst case” condition, this pressure prediction is based upon formation pressure minus a wellbore filled with dry gas. It is used to determine casing design and BOP equipment working pressure requirements.
Measurement While Drilling	Downhole tools that take specific measurements and relay the data to surface for analysis.
Mechanical Barrier	Installed mechanical equipment, verified by testing, and capable of containing a formation influx.
Mud Balance	A device to measure the density of the drilling fluid. There are two main types: atmospheric and pressurized.
Necking	The tendency of tubulars to taper to a reduced diameter at some point when subjected to excessive tensional stress and/or external pressure.
Non-Aqueous Fluid (NAF)	An emulsion in which the continuous phase is a water-immiscible fluid (i.e., synthetic or mineral oil) and in which water (commonly brine) is the discontinuous, dispersed internal phase.
Non-shearable	Tool or tubular that is used in the well that cannot be sheared by the Shear Ram installed in the Blowout Preventer.

Offset Well	A well that is planned or drilled in close proximity to an existing well. The term "offset" refers to the lateral distance between the two wells.
Oil-Based Mud (OBM)	A fluid in which the continuous phase is a product obtained from petroleum distillation (e.g., diesel oil or mineral oil).
Open Hole	Uncased part of the wellbore.
Operating Pressure	The well site test pressure minus the PCE safety margin. This is the maximum pressure permitted during the well intervention operation. *Note: this definition applies to the lowest pressure rated component of the barrier envelope.*
Packer	The major component of most downhole completion designs. The major function of a packer is to provide a pressure-tight seal between the tubing and casing so fluid flow will be diverted up the tubing rather than up the tubing-casing annulus. This protects the casing from pressure and corrosive fluids.
Permeability	The ability of fluid to flow from one pore space to another. Unit of measurement is the millidarcy or 0.001 Darcy.
Pill(s)	A small quantity of a specific fluid that is pumped into the well to perform a specific function. For example, a “stuck-pipe releasing” pill.
Pilot Hole	A small hole drilled into the formation before opening it up to a larger diameter. Often used when drilling tophole formations where there is a risk of shallow gas.
Pipe Light / Pipe Heavy	Used to define the relationship between the weight of the drillstring and the force required to strip the string into the well. Pipe light occurs when the force required to lower the string is greater than the weight of the string. In this case, the string has to be “snubbed” into the well. Pipe heavy occurs when the weight of the string is greater than the upward force acting on the string. In this case, the string can be “stripped” into the well.
Pit Volume Totalizer (PVT)	A series of devices that continuously monitor the level of the drilling mud in the mud tanks. The PVT displays for the Driller fluid volume, gains, and losses contained in a selected combination of fluid tanks or pits.
Porosity	The spaces within a rock. The ratio of the volume of empty space to the volume of solid rock in a formation, indicating how much fluid a rock can hold.
Positive Test	A test in which pressure is applied to create a pressure differential across the barrier element.

Pressure Control	Utilization of equipment that helps in maintaining the optimal pressure and fluid levels inside a wellbore when any well intervention operations are performed by an operator in any condition (e.g., lubricator and pack-off, stripper assembly, snubbing rams, or any pressure sealing expendables).
Pressure Controlling Barrier	A tested mechanical device or combination of tested mechanical devices, that provides pressure containment and does not require constant monitoring to perform it's intended function (e.g., MPD equipment).
Pressure Control Device (PCD)	Device or system that provides pressure containment and requires constant monitoring and operational support. PCD could be dynamic or static (see individual definitions).
Pressure Control Envelope (Well Servicing Equipment)	Combination of pressure control equipment and devices associated to control and prevent the escape of fluids or pressure in a wellbore.
Pressure Control Equipment (PCE)	Combination of operational specific devices or barrier element(s) designed to safely manage the pressure and flow from a well contributing to total system reliability.
Pressure Control Equipment (PCE) Safety Margin	Additional pressure required to perform a well kill (a best industry practice is 20% of rated working pressure). *Note: this definition applies to the lowest pressure rated component of the barrier envelope.*
Pressure Gradient	The hydrostatic pressure per vertical foot of a given fluid.
Procedural / Operational Barrier	Set of policies and procedures used in conjunction with mechanical barriers to assist in the control and monitoring of the well. Operational barriers are practices that result in activation of a physical barrier. Though physical barriers may dominate, the total system reliability of a particular design is dependent on the existence of both types of barriers (e.g., training, procedures for closing BOP, procedures for installing FOSV, tripping, plans and procedures for handling kicks, diverter procedures, procedures for Emergency Disconnect, procedures for LMRP Disconnect).
Production Tree	An assembly of valves, spools, and fittings used for an oil well, gas well, water injection well, etc. The primary function of the production tree is to control the flow, usually oil or gas, out of the well.
Primary Barrier	First utilized well barrier element(s) that prevent flow from a source.
Primary Well Control	The kind of well control that occurs when drilling fluid hydrostatic pressure is sufficient to control the formation fluid pressure.

Pump Rate	Rate at which a pump can push fluid through a known system (in stroke or barrels or cubes).
Quad Stack (Coiled Tubing / Wireline)	Designed to prevent uncontrolled fluid flow from a wellbore during coiled tubing/wireline operations. It's a crucial safety device that provides multiple layers of protection in case of an emergency.
Rate of Penetration (ROP)	The speed at which the drill bit can break the rock under it and thus deepen the wellbore. This speed is usually reported in units of feet per hour or meters per hour.
Rated Working Pressure (RWP)	The maximum internal pressure that equipment is designed to contain and/or control under normal operating conditions.
Relief Well	A well drilled with the specific purpose of intersecting another well to kill an uncontrolled flow or blowout in that well.
Remotely Operated Vehicle (ROV)	An unmanned submersible vehicle controlled from surface. In deepwater operations, remotely operated vehicles are used to inspect subsea structures and equipment and to control or manipulate valves.
Reservoir	A subsurface body of rock having sufficient porosity and permeability to store and permit extraction of fluids. Sedimentary rocks are the most common reservoir rocks because they have more porosity than most igneous and metamorphic rocks and form under temperature conditions at which hydrocarbons can be preserved.
Riser Gas	Gas in the drilling fluid that is above the subsea BOP and is therefore free to migrate upward and expand without any control from the well control equipment.
Riser Margin	The mud weight difference between the hydrostatic pressure generated by the mud column in the riser to the mud line and the hydrostatic pressure generated by the seawater column to the mud line to be added below mud line in a planned disconnect.
Risk Management	Systematic application of management policies, procedures, and practices to the activities of communicating, consulting, establishing the context of, identifying, analyzing, evaluating, treating, monitoring, and reviewing risk.
Rock Matrix	The solid part of the rock. Together with the pore spaces (porosity), the rock matrix makes up the total volume of the rock.
Safety Head	A shearing and sealing pressure containment device.
Safety Margin (Drilling)	A pressure, in excess of the minimum pressure, that is applied to the wellbore to create an overbalance during an operation, thus reducing the risk of an underbalance situation and potential kick.

Safety Margin (Intervention, PCE)	A factor of reduction applied for a planned well or test pressure to mitigate exceeding the maximum pressure ratings.
Safety Rams	In snubbing operations, safety rams are static, stand-alone, hydraulically operated pipe sealing mechanisms utilized to isolate formation annulus pressure during the repair and maintenance of snubbing stripper assemblies in live well conditions.
Sandstone	A clastic sedimentary rock whose grains are predominantly sand-sized. The term is commonly used to imply consolidated sand or a rock made of predominantly quartz sand, although sandstones often contain feldspar, rock fragments, mica, and numerous additional mineral grains held together with silica or another type of cement.
Saturation Point	The maximum amount of solute that can dissolve in a solvent before the solvent can no longer dissolve it (e.g., the amount of salt that can dissolve in water).
Secondary Barrier	Second well barrier elements that prevents flow from the source, and designed to withstand failure of primary barrier.
Secondary Well Control	The use of well control equipment to prevent a further influx following failure of primary well control.
Self-Fill (Auto-Fill) Float	Casing float equipment that allows the casing to fill when running in the hole. This can reduce surge pressure on the formation. In case of float failure, regular checks should be made to ensure casing is kept full.
Shale	A fine-grained, fissile, detrital sedimentary rock formed by consolidation of clay and silt-sized particles into thin, relatively impermeable layers. It is the most abundant sedimentary rock.
Shut-In Casing Pressure	After the pressure has stabilized, it is the surface pressure measured at the Choke Manifold or casing head that represents the underbalance pressure in the annulus between the fluid hydrostatic pressure (mud and influx) and the formation fluid pressure.
Shut-In Drillpipe Pressure	After the pressure has stabilized, it is the surface pressure measured at the Standpipe Manifold that represents the underbalance pressure in the drillstring between the mud hydrostatic pressure and the formation fluid pressure.
Shut-In Tubing Pressure	After the pressure has stabilized, it is the surface pressure measured at the top of the tubing in a production well. It represents the underbalance pressure in the tubing between the hydrostatic pressure of the fluid in the tubing and the formation fluid pressure.
Slickline Stuffing Box	A pressure control device that provides an elastomeric dynamic seal during slickline operations.

Sliding Sleeve	Device used to establish or shut off communication between the tubing string and the casing annulus for selective stimulation or production.
Slow Circulation Rate (SCR)	Circulation rate used while running a dynamic kill. Also called Slow Pump Rate.
Slow Circulation Rate Pressure (SCRP)	Pressure required to overcome friction at a given slow pump rate.
Slug	A volume of mud pill that is denser than the mud in the drillpipe and wellbore annulus. A slug is used to displace mud out of the upper part of the drillpipe before pulling pipe out of the hole and is mixed in the pill pit by adding weighting material (e.g., barite) to a few barrels of mud from the surface pits. The pill is pumped into the top of the drillstring to U-tube mud downward, out of the pipe, thus keeping the upper stands of pipe empty during trips.
Snubbing	The process of running or pulling tubulars under pressure in a live well when the forces of the well are greater than the weight of pipe (pipe light).
Snubbing Unit	A unit required to move jointed tubulars in or out of a well under pressure.
Solids Control Equipment	Equipment located on surface that cleans solids from the drilling fluid. For example: shale shakers, mud cleaners, desilters, and centrifuges.
Solubility	The property of a solid, liquid, or gaseous substance (called *solute*) in which the substance dissolves in a solid, liquid, or gaseous solvent to form a homogeneous solution. For example, formation gas into oil-based drilling fluid.
Startup/Shutdown	Startup refers to the process of bringing the pumps up to speed at the start of a kill operation in order to maintain correct bottomhole pressure. Shutdown is the reverse, shutting down the pump.
Static Pressure Control Devices	Pressure control equipment that is utilized to seal with a stationary pipe, wire, or coiled tubing across its sealing surfaces in live well intervention (e.g., CT BOP, secondary strippers, wireline rams, dual flapper valves).
Stationary Slip Bowls	Located and attached to the snubbing units frame to secure the pipe from moving in either direction (one or more set(s) pipe light, one set pipe heavy) while the jack head is positioned to secure the pipe to move pipe into or out of the hole.
Stop Work Authority	A program that provides all operator and contractor/service personnel, directly or indirectly involved with the operation, the responsibility and authority to cease any work activities that may present a hazard. Work cannot resume until the activity is reviewed and found to be safe.

Strand (API Spec 9A)	An element of rope normally consisting of an assembly of wires of appropriate shape and dimensions laid helically in the same direction in one or more layers around a center.
Stripping	The process of running or pulling tubulars, in a live or pressurized well, through a sealing element when the forces of the well are less than the weight of pipe (pipe heavy).
Subsurface	The geological interval below the surface or seabed.
Subsurface Safety Valve	A safety valve installed in the production tubing. Maintained in the normally open position by surface pressure, the valve will close in the event of a well integrity problem above the valve.
Surface Back Pressure (SBP)	Pressure applied to the well and added to Bottom Hole Pressure (BHP) as a result of the flow passing through the MPD surface system. The magnitude and variation of the surface pressure are controlled by manipulating the choke.
Surface Pressure	Any pressure exerted at the top of a column of fluid.
Surge Pressure	The result of wellbore pressure being temporarily increased as pipe is run into the well.
Swab Kicks	An influx that occurs when the hydrostatic pressure of the well is reduced due to an upward motion to be less than the formation pressure (e.g., pulling pipe to fast or pulling a piece of equipment full drift and not allowing for fluid bypass).
Swab Pressure	The temporary reduction in the bottomhole pressure that results from the upward movement of pipe in the hole. The movement of the drillstring or casing through the wellbore is similar to the movement of a loosely fit piston through a vertical cylinder. A pressure reduction or suction pressure occurs below as the piston or the pipe is moved upward in the cylinder or wellbore, and a pressure increase occurs below as they move downward.
Top-Hole/Surface Section	The initial section of a wellbore drilled from the surface to a depth where the casing string is set. This depth is typically determined by geological formations, fresh water zones, regulatory requirements, well design considerations, and potential shallow hazards encountered during drilling.
Transition Zone	A section of formation where fluid pressures are changing.
Trapped Pressure and Trapped Gas	Fluid pressure trapped in the well or the piping system. Trapped gas is gas that is trapped under pressure on the downstream side of the well control equipment.
Traveling Slip Bowls	Located and attached to the hydraulic jack head and secure the pipe to move pipe into or out of the hole.

Tri-axial	Combination of applied stresses (torsional, tensional, and compressive) acting on tubulars.
Trip Margin	Additional weight added to the drilling fluid that compensates for predicted swabbing pressure when tripping out of the hole.
Trip Sheet	A form that documents pipe “tripped” from the well against fluid pumped into the well to replace pipe-displacement volume; used to detect swabbing. The trip sheet is also used when tripping in the hole to detect surging.
Trip Tank	A metal tank with a small capacity—about 20-40 bbl with 1 bbl divisions inside—used to monitor the well during trips and flow checks.
Tubing	Any tubular that serves as a conduit for reservoir and/or injection fluids.
Tubing Displacement	See Displacement
Tubular Buckling	A permanent deformation of the tubular caused by excessive compression from upper loading (snub force from jack) or pressure applied upward force in insufficiently supported columns.
Underbalanced Drilling	A technique used in drilling, under conditions where the hydrostatic pressure of the drilling fluid column is intentionally designed to be lower than the pressure of the formation being drilled, causing fluids or gases to flow naturally into the well. Imposed annular pressure loss (APL) may or may not increase total pressure applied to be above formation pressure.
Unsupported Length	Any interval above the production tree where the tubular is insufficiently supported to prevent buckling.
U-Tube	A way to describe the well where the drillstring volume and annulus volume represent the two arms of a U-shaped tube. The pressures and/or mud levels in each arm balance each other.
Volumetric Method	To control bottom hole pressure and allow influx to migrate without causing any damage to the well.
Wait and Weight Method	Kill method where kill mud is circulated around the well at the same time as the influx is removed.

Well Life Cycle	The complete life of a well. There are multiple possible phases to a well's life cycle, including, but not limited to, planning and design, drilling, testing, completion, operations (production and injection), workover/intervention, and abandonment. The well life cycle can span several decades and involves various disciplines, including geology, engineering, drilling, completions, production, and environmental management. It's a complex process aimed at safely and efficiently extracting hydrocarbons while minimizing environmental impact.
Well Servicing BOP Stack	An integral body or an assembly of well control components including ram-type components, annular components, auxiliary valves, and spools connected to the top of the wellhead or production tree to control well fluids.
Well Integrity	The ability of a well to maintain its structural integrity and prevent the uncontrolled flow of fluids or gases between the wellbore and the surrounding formation, preventing unintended release into the environment. It encompasses the various components of a well, including the casing, cement, and other materials used to seal the wellbore throughout its life cycle.
Well Intervention	Any operation performed on a producing (live) well. These operations can be carried out to initiate production, improve well performance, address operational issues, or maintain well integrity.
Wellbore	The hole drilled by the bit. The wellbore is defined by the dimensions and potential volume of the hole and can be openhole (bounded by rock or the geological formation) or cased hole (bounded by casing).
Wellhead	The equipment installed at the top of the wellbore. The wellhead incorporates a means of supporting the tubing, tree, and surface flow-control facilities.
Wellsite Test Pressure	The pressure at which the component or system is tested. Shall not exceed rated working pressure. *Note: this definition applies to the lowest pressure rated component of the barrier envelope.*
Wireline	Operations involving the lowering of equipment or measurement tools into and out of a wellbore using wire mounted on a power reel on surface for the purposes of performing well intervention, reservoir evaluation, and pipe recovery.

Wireline Pack-off	A device designed to create a temporary, pressure-tight seal around a wireline cable as it passes through a wellhead or other opening in the wellbore.
Wireline Shear Seal Ram	A full opening, hydraulically controlled, ram normally installed below the wireline ram and above the tree valves. Its primary function is to shear wireline and seal off through the bore.
Wireline Ram	An enclosed device with one or more rams capable of closing and sealing around the wireline.
Workover	Process of performing major maintenance or remedial treatments on a producing oil or gas well. In many cases, workover implies the removal and replacement of the production tubing string after the well has been killed and a workover rig has been placed on location.