

## 16 GLOSSARY OF ABBREVIATIONS, ACRONYMS AND DEFINITIONS

**10<sup>3</sup>.** Abbreviation for thousand.

**10<sup>6</sup>.** Abbreviation for million.

**10<sup>6</sup>m<sup>3</sup>.** Abbreviation for million cubic metres.

**10<sup>9</sup>.** Abbreviation for billion.

**10<sup>9</sup>m<sup>3</sup>.** Abbreviation for billion cubic metres.

**abandonment.** The decommissioning of facilities and removal of offshore structures following exhaustion of reserves.

**accretion.** Growth by organic enlargement; growing of separate things into one.

**ADW.** Acronym for Approval to Drill Wells.

**advection.** The process of, or referring to the transport of one fluid mass (air, water) by the movement of another.

**AERP.** Acronym for Alert and Emergency Response Plan.

**anomaly.** A geological feature, especially in the subsurface, distinguished by geological, geophysical or geochemical means, which is different from the general surroundings and is often of potential economic value (for example, a magnetic anomaly).

**ANSI.** Acronym for American National Standards Institute.

**anticline.** A fold, generally convex upward, whose core contains the stratigraphically oldest rocks.

**API.** Acronym for American Petroleum Institute.

**argillaceous.** Applied to all rocks or substances composed of clay minerals, or having a notable proportion of clay in their composition (for example, shale, slate, etc.).

**ASME.** Acronym for America Society of Mechanical Engineers.

**as spent.** Cost at the time the dollar is spent or investment is made. Sometimes referred to a “Nominal dollar”.

**authigenic.** Pertaining to minerals crystallized within an enclosing sediment during or after deposition, either infilling void space or replacing pre-existing rock constituents.

**Avalon Formation.** A particular rock deposit that formed approximately 110 million years ago in the Cretaceous period. It is the reservoir rock of the White Rose South oil pool and the principal reservoir rock of the White Rose Oilfield.

**avg.** Abbreviation for average.

**AWO.** Acronym for Approval for Well Operations.

**B.** Abbreviation for boron.

**Ba.** Abbreviation for barium.

**barite.** A mineral (barium sulphate); used as a weighting material for drilling because of its high specific gravity.

**basement.** The undifferentiated complex of rocks that underlies the sedimentary rocks of interest in an area.

**bathymetry.** The measurement of depths of water in oceans, seas and lakes; also the information derived from such measurements.

**bbf.** The abbreviation for barrel.

**bedding plane.** A planar or nearly planar bedding surface that visibly separates each successive layer of stratified rock (of the same or different lithology) from the preceding or following layer; an original surface of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a colour difference, or both.

**bedrock.** A general term for the rock, usually solid, that underlies soil or other unconsolidated, superficial material.

**bergy bit.** A piece of floating glacier having a sail greater than 1.5 m but less than 5 m and a water plane area greater than 20 m<sup>2</sup> but less than 300 m<sup>2</sup>. Size approximates that of a small house and mass is between 120 and 5,400 t.

**BHT.** Acronym for bottomhole temperature.

**bioclastic.** Refers to rock constituents consisting of fragmental organic remains.

**biodegradation.** The biological conversion of organic material to inorganic nutrients.

**bioturbation.** The churning and stirring of a sediment by organisms.

**BOP.** Acronym for blowout preventer.

**BOPD.** Abbreviation for barrels of oil per day.

**boulder.** A rounded rock fragment greater than 256 mm in diameter.

**BS&W.** Acronym for basic sediment and water.

**Br.** Abbreviation for bromine.

**bubble point pressure.** The pressure at which the first bubbles of gas appear from the liquid phase.

**Ca.** Abbreviation for calcium.

**calcareous.** Containing calcium carbonate.

**calcite.** A mineral with the composition  $\text{CaCO}_3$ ; the principal constituent of limestone; a common authigenic cement in sandstones.

**CALM.** Acronym for Catenary Anchor Leg Mooring.

**Capex.** Acronym for capital expenditure.

**CAPP.** Acronym for Canadian Association of Petroleum Producers.

**CBFC.** Acronym for Cumberland Belt-Flemish Cap.

**CCG.** Acronym for Canadian Coast Guard.

**C-CORE.** Acronym for Centre for Cold Ocean Resources Engineering.

**CCR.** Acronym for central control room.

**CEAA.** Acronym for Canadian Environmental Assessment Act.

**CERT.** Acronym for Corporate Emergency Response Team.

**Christmas Tree.** Arrangement of valves and fittings attached to the tubing head to control flow and provide access to the tubing string.

**Cl.** Abbreviation for chlorine.

**clast.** An individual detrital constituent of a sediment.

**clastic.** Pertaining to a rock or sediment composed principally of individual fragments or grains, commonly derived from pre-existing rocks or minerals; also said of the texture of such a rock. The term has been used to indicate a source both within and outside the depositional basin.

**clay.** A mineral fragment or detrital particle of any composition (often having a crystalline fragment of a clay mineral), smaller than a very fine silt grain, having a diameter less than 4 µm.

**claystone.** An indurated clay having the texture and composition of shale but lacking its fine lamination or fissility.

**cluster.** Wells grouped together to minimize infield flowlines.

**CMG.** Acronym for course made good.

**C-NOPB.** Acronym for Canada-Newfoundland Offshore Petroleum Board.

**CO<sub>2</sub>.** Abbreviation for carbon dioxide.

**COB.** Acronym for continent-ocean boundary.

**cobble.** A rounded rock fragment between 64 and 256 mm in diameter.

**compaction (sediment).** Reduction in bulk volume, or thickness of, or the pore space within a body of sediments in response to the increasing weight of overlying material that is continually being deposited or to the pressures resulting from earth movements within the crust. It is expressed as a decrease in porosity brought about by a tighter packing of the sediment particles.

**complex.** A large geological structural feature composed of several smaller structural features. In this case, the complex refers to the White Rose salt dome and adjacent collapse features, including many individual fault blocks.

**condensate.** Liquid hydrocarbons that are produced with natural gas and that separate from the gas as a result of decreases in temperature and pressure.

**Continental Shelf.** Gently sloping, shallowly submerged marginal zone of the continents extending from the shore to an abrupt increase in bottom inclination; greatest average depth less than 183 m, slope generally less than 1 to 1,000, local relief less than 18.3 m, width ranging from very narrow to more than 320 km.

**Continental Slope.** Continuously sloping portion of the continental margin with gradient of more than 1 to 40, beginning at the outer edge of the Continental Shelf and bounded on the outside by a rather abrupt decrease in slope where the continental rise begins at depths ranging from approximately 1,400 and 3,000 m.

**COPS.** Acronym for Cougar Offshore Personnel System.

**core.** A cylindrical boring of rock from which composition and stratification may be determined.

**COT.** Acronym for cargo oil tank.

**CPA.** Acronym for closest point of approach.

**Cretaceous.** A period of geological time approximately 131 to 65 million years ago. Dinosaurs and other reptiles thrived in the early Cretaceous but by the end of this period, dinosaurs and many of the reptiles had become extinct.

**crude oil.** Unrefined petroleum.

**current shear.** A tangent or plane of contact where two opposing currents collide and are subsequently driven away from each other.

**cuttings.** Chips and small fragments of rock that are brought to the surface by the drilling mud as it circulates.

**cuvette.** A small depositional area, smaller than a basin or a sub-basin.

**d.** Abbreviation for day.

**DA.** Acronym for Development Application.

**dB.** Abbreviation for decibel.

**DCS.** Acronym for distributed control system.

**deadweight.** The maximum design weight of cargo, crew and effects for a ship (the “payload”).

**dehydration.** Removal of water from a hydrocarbon fluid.

**delineation wells.** Wells drilled after the initial exploration well to give a better understanding of the extent and performance of the reservoir.

**deltaic.** Pertaining to, or like a delta.

**detrital.** Particles occurring in sedimentary rocks that were derived from pre-existing igneous, sedimentary or metamorphic rocks, or other pre-existing material.

**Development (White Rose Oilfield Development).** "Development" refers to all phases of the project, from the decision to go ahead with construction through to abandonment of the field.

**Development Application.** The official title of the documentation submitted to the C-NOPB in support of an oilfield development request. The White Rose Development Application includes and Project Summary and five volumes: Canada-Newfoundland Benefits Plan (Volume 1); Development Plan (Volume 2); Environmental Impact Statement (Volume 3 - Comprehensive Study Part One); Socio-Economic Impact Statement (Volume 4 - Comprehensive Study Part Two); and Safety Plan/Concept Safety Analysis (Volume 5).

**DFO.** Acronym for Department of Fisheries and Oceans.

**DGPS.** Acronym for Differential Global Positioning System.

**diagenesis.** Process involving physical and chemical changes in sediment during and after consolidation; includes compaction, cementation, recrystallization, replacement and dissolution.

**diapir.** A dome or anticlinal fold in which the overlying rocks have been ruptured by the squeezing-out of plastic core material. Diapirs in sedimentary strata usually contain cores of salt or shale.

**discovery well.** An exploratory well that encounters a new and previously untapped petroleum deposit; a successful wildcat well.

**DND.** Acronym for Department of National Defence.

**DNV.** Acronym for Det Norske Veritas.

**dolomite.** Mineral with the chemical composition  $\text{CaMg}(\text{CO}_3)_2$  occurring as cement and/or grain replacement in the sandstone.

**down dip.** A direction towards a lower elevation from a given point on a structure or surface.

**DPA.** Acronym for Drilling Program Authorization.

**drill centre.** Location at which a group of wells is drilled.

**drilling mud.** Water used as the liquid phase in water-based mud; usually denoting non-saline water.

**drilling platform.** An offshore structure from which a number of wells are drilled. The legs of the platform are anchored to the seabed and the platform is built on a large-diameter pipe frame.

**drilling rig.** A ship-shaped or semi-submersible vessel, or a jackup platform, with equipment suitable for offshore drilling.

**drillstem test (DST).** A short-term test of the productive capacity of a well through drillpipe.

**DSV.** Acronym for Diving Support Vessel.

**DWT.** Acronym for Dead weight tonnage.

**EC.** Abbreviation for Environment Canada.

**ECERT.** Acronym for East Coast Emergency Response Team.

**EIS.** Acronym for Environmental Impact Statement.

**Environmental Impact Statement (EIS).** A document that attempts to predict the effects of a major development might have on the human and natural environments of a given geographic area. An EIS is prepared to enable industry, government and the public to consider the environmental costs and benefits of a development project. Based on the information contained in the EIS, decisions can be made on whether to proceed with the development project.

**EPIC.** Acronym for engineer, procure, install and commission.

**estuary.** That area of a coastal embayment that is under the influence of both fresh water and seawater.

**ethane.** A simple hydrocarbon composed of two carbon atoms and six hydrogen atoms; a gas at atmospheric conditions.

**euxinic.** Pertaining to an environment of restricted circulation and stagnant or anaerobic conditions; anoxic.

**exploration well.** A well drilled in an attempt to find an oil- or gas-bearing formation.

**facies (sedimentary).** The appearance and characteristics of a rock unit reflecting the depositional environment of its origin, as distinguished from adjacent units of different origin.

**fault.** A fracture or fracture zone along which there has been displacement of the sides relative to each other parallel to the fracture. The displacement may be a few millimetres or many kilometres.

**Fault Block Traps.** A hydrocarbon trap created by differential movement along faults that fragment the reservoir into one of several structural compartments.

**fault fan.** Antithetic and synthetic minor faults related to a major listric fault.

**Fe.** Abbreviation for iron.

**FEED.** Acronym for front end engineering and design.

**FGD.** Acronym for fire and gas detection.

**FGS.** Acronym for fire and gas detection system.

**First Oil.** Milestone achieved when the first shuttle tanker has been filled with oil from the production system and the shuttle tanker disconnects from the offloading system. The entire production system is handed over to operations personnel at this point. This is the first quantity of oil to be delivered from the reservoir through the complete production and offloading system, including fiscal metering.

**flare.** An arrangement of piping and burners used to dispose of surplus combustible vapours (by burning).

**flaring.** Disposal of surplus combustible vapours by burning at the discharge of the flare tower.

**flaser.** Ripple cross-lamination in which mud streaks are preserved in the troughs but incompletely or not at all on the crests.

**floating production system.** A monohull or semi-submersible vessel with equipment suitable for producing hydrocarbons.

**flowline.** Pipe which conveys crude oil, water and/or gas from the well to the riser, or water or gas from the riser to the well.

**foraminifer.** Any protozoan belonging to the subclass Sarcodina, order Foraminifera; unicellular animals mostly of microscopic size that secrete tests, composed of calcium carbonate, or build them of cemented sedimentary grains, consisting of one to many chambers arranged in a great variety of ways. Most foraminifers are marine, but freshwater forms are known.

**formation water.** Water present in a water-bearing formation under natural conditions, as opposed to introduced fluids, such as drilling mud.

**FPDSO.** Acronym for floating production, drilling, storage and offloading facility.

**FPF.** Acronym for floating production facility.

**FPSO.** Acronym for floating production, storage and offloading facility.

**FSU.** Acronym for floating storage unit.

**FVF.** Acronym for formation volume factor.

**gas lift.** Gas injected into the well to reduce the hydrostatic pressure on the fluid column and hence enhance flow.

**GBS.** Acronym for gravity based structure.

**geology.** The study of the structure, origin, history and development of the Earth.

**geostrophic.** Pertaining to deflecting force resulting from the Earth's rotation.

**glaciomarine.** Marine sediments that contain glacial material.

**glauconite.** A green mineral, closely related to the micas and essentially a hydrous potassium iron silicate. Commonly occurs in sedimentary rocks of shallow-marine origin.

**glory hole.** Hole, excavated in the seabed, in which wellhead facilities are placed for protection from iceberg scour.

**GMDSS.** Acronym for Global Marine Distress Signalling System.

**GOR.** Acronym for gas-oil ratio.

**GPS.** Acronym for Global Positioning Systems.

**graben.** A fault-bounded elongate crustal block that is down-dropped relative to adjacent crustal blocks, usually resulting in a topographic low.

**grain.** A general term for sedimentary particles of all sizes (from clay to boulders), as used in the expressions "grain size," "fine-grained" and "coarse-grained".

**gyre.** Circular movement of water masses.

**h.** The abbreviation for hour.

**H<sub>2</sub>S.** Abbreviation for hydrogen sulphide.

**halokinesis.** A general term for the study of the structure and mechanism of emplacement of salt domes and other salt-controlled structures.

**HAZID.** Acronym for Hazard Identification.

**HAZOPS.** Acronym for hazard and operability studies.

**HCO<sub>3</sub>.** Abbreviation for formate.

**HF.** Acronym for high frequency radio.

**HP.** Abbreviation for high pressure.

**HMDC.** Acronym for Hibernia Management and Development Company.

**HS&E.** Acronym for Health, Safety and Environment.

**Husky Oil.** Abbreviation for Husky Oil Operations Limited.

**HVAC.** Acronym for heating, ventilation and air conditioning.

**hyperbenthic.** Benthic or bottom organisms that spend part of their time on the water column for feeding of reproduction.

**Hz.** The abbreviation for hertz; unit of sound frequency equal to one cycle per second.

**I.** Abbreviation for iodide.

**IC.** Abbreviation for Industry Canada.

**iceberg scour.** Seafloor trench caused by the ploughing motion of an iceberg grounding on the ocean floor.

**ichnology.** The study of fossil tracks, trails, burrows, tubes and borings resulting from the life activities of animals, which took place on or in soft sediment.

**ID.** Acronym for internal diameter.

**IIF.** Acronym for input initiating frequency.

**IMO.** Acronym for International Maritime Organization.

**infilling.** A process of deposition by which sediment falls or is washed into depressions, cracks or holes, as the filling in of crevasses upon the melting of glacial ice.

**injection water.** Water pumped into the formation to maintain reservoir pressure (secondary recovery technique); offshore, injection water is filtered seawater treated with biocides, oxygen scavenger and scale inhibitor.

**IR.** Acronym for Individual Risk.

**isopach.** A line on a map drawn through points of equal thickness of a designated unit.

**Jurassic.** A period of geologic time from approximately 210 to 131 million years ago. Older plant groups continued to decline and newer forms continued to spread, dinosaurs were growing in size and becoming specialized for varied ways of life, and marsupial mammals and the first birds appeared.

**K.** Abbreviation for potassium.

**kaolinite.** A common clay mineral. Two-layer hydrous aluminum silicate having the general formula  $Al_2(Si_2O_5)(OH)_4$ .

**kerogen.** Fossilized, insoluble, organic material in sedimentary rocks (usually shales) that can be converted by distillation to petroleum products.

**killing the well.** Causing the flow from the well to come to a complete stop.

**km.** The abbreviation for kilometre.

**km<sup>2</sup>.** The abbreviation for square kilometre.

**kPa.** Abbreviation for kiloPascal.

**KSLO.** Acronym for Kvaerner-SNC Lavalin Offshore.

**kV.** The abbreviation for kilovolts.

**kv/kh ratio.** Vertical to horizontal permeability ratio.

**kW.** The abbreviation for kilowatts.

**L.** The abbreviation for litre.

**larva.** The first immature phases of many animals after hatching of eggs and before assuming the adult form and habitat.

**listric fault.** A fault with a curvilinear concave-upward surface, dipping more steeply flattening with depth.

**lithofacies.** A subdivision of a specified stratigraphic unit distinguished on the basis of lithological features.

**lithology.** The physical character of a rock.

**lithostratigraphy.** The study of the physical make-up of strata and their organization into units based on lithological character.

**logging.** A systematic recording of data from the driller's log, mud log, electrical well log or radioactivity log.

**Lower Cretaceous.** The older strata of the Cretaceous period, which ranges from 65 million years before present to 131 million years before present.

**LP.** Abbreviation for low pressure.

**LWD.** Acronym for logging while drilling.

**m.** The abbreviation for a) metre or b) earthquake magnitude.

**m<sup>2</sup>.** The abbreviation for square metre.

**m<sup>3</sup>.** The abbreviation for cubic metre.

**manifold.** Device which routes the flow from several wells into organized flow streams.

**marl.** Calcareous clays; consolidated primary calcareous clays.

**matrix.** The natural material, generally argillaceous, in which any metal, fossil, pebble, crystal, etc., is embedded; interstitial detrital argillaceous material in sandstones.

**mBRT.** Acronym for metres below rotary table.

**mD.** The abbreviation for milliDarcy.

**MDT.** A wireline tool normally run as part of a logging program. The tool can be used to collect pressure, temperature and fluid information from most porous intervals.

**Mesozoic.** An era of geologic time, from the end of the Paleozoic to the beginning of the Cenozoic, or from approximately 225 to 65 million years ago.

**MFPSV.** Acronym for Multifunctional Platform Support Vessel.

**mg.** The abbreviation for milligram.

**Mg.** Abbreviation for magnesium.

**micropaleontology.** A branch of paleontology that deals with the study of fossils too small to be observed without the aid of a microscope.

**migration.** In seismic processing, plotting of dipping reflections in their true spatial positions.

**min.** Abbreviation for minute.

**mm.** The abbreviation for millimetre.

**Mn.** Abbreviation for Manganese.

**MODU.** Acronym for mobile offshore drilling units.

**mol.** Abbreviation for molecular weight.

**monohull.** A ship-shaped vessel.

**monophasic sample containers.** Sample containers used to capture single phase samples of reservoir fluids and keep the samples in a single phase, as the sample's temperature is reduced, by elevating the samples pressure after the sample is collected.

**MPa.** The abbreviation for megapascal.

**mSS.** Abbreviation for metres subsea.

**mud pulse telemetry directional tools.** These tools (commonly referred to as MWD) measure and transmit to surface all the drill bit orientation information required to guide the directional drilling operations. The tool transmits the information up the drill pipe by creating coded pressure pulses in the mud column. The pulses are then decoded by surface computers, which then present the information to drilling personnel.

**MW.** Abbreviation for megawatt.

**MWD.** Acronym for measurement while drilling.

**N<sub>2</sub>.** Abbreviation for nitrogen.

**Na.** Abbreviation for sodium.

**NACE.** Acronym for National Association of Corrosion Engineers.

**NEB.** Acronym for National Energy Board.

**net oil pay.** The remaining pay thickness in an oil zone after zones of low porosity, shale, and high water saturation have been discounted.

**NGL.** Acronym for natural gas liquids; liquid hydrocarbons produced with natural gas that separate from the gas as a result of decreases in temperature and pressure.

**NPV.** Acronym for net present value.

**NTFZ.** Acronym for Newfoundland Transform Fault Zone.

**OEC.** Acronym for overpressure exceedence curve.

**OGIP.** Acronym for original gas in place.

**OIM.** Acronym for offshore installation manager.

**oleoclasts.** Bacteria that have the ability to degrade hydrocarbons.

**OLS.** Acronym for offshore loading system.

**OOIP.** Acronym for original oil in place.

**oolite.** Small, round, sand-sized accretionary grains of calcium carbonate.

**Operations Phase.** The period following First Oil until cessation of all oil production from the White Rose oilfield. Includes post-First Oil development drilling, offshore installation activities, production, operations, maintenance, well abandonment, decommissioning and removal from the White Rose oilfield of all facilities, equipment and vessels used in the production system.

**Operator.** When capitalized in the Development Application, refers to Husky Oil.

**Opex.** Acronym for operating expenditure.

**ORED.** Acronym for Offshore Reliability Database.

**OSC.** Acronym for On-Scene Commander.

**overpressured.** A subsurface formation that exerts an abnormally high formation pressure on a wellbore drilled into it.

**Owner/Operator.** When capitalized in the Development Application, refers to Husky Oil and Petro-Canada.

**P50.** Acronym for 50 percent probability.

**P&S.** Acronym for plugged and suspended.

**Pa.** Abbreviation for pascal.

**paleo.** Ancient, old.

**paleogeography.** The geography of ancient times or of a particular past geological epoch.

**paleontology.** A science dealing with the life of past geological periods as known from fossil remains.

**palinspastic.** Geological features that are restored as nearly as possible to their original geographic position.

**palynology.** A branch of science dealing with the study of pollen, spores and dinoflagellates, either living or fossil.

**PAU.** Acronym for pre-assembled unit.

**pebbles.** Smooth rounded stones ranging from 2 to 64 mm in diameter.

**perforating.** Piercing the casing wall and cement sheath to provide a flow path through which formation fluids may enter the wellbore. Perforating is done with shaped explosive charges.

**permeability.** The capacity of a rock to transmit a fluid. Degree of permeability depends upon the size and shape of the pores, the size and shape of their connections, and the extent of the latter. It is measured by the rate at which a fluid of standard viscosity can move a given distance through a given interval of time.

**petroleum.** Oil and natural gas.

**PFD.** Acronym for process flow diagrams.

**pig.** Device used for pumping through a pipeline to clean the walls or remove an obstruction.

**PIP.** Acronym for Petroleum Incentive Program.

**PLL.** Acronym for probable loss of life.

**PLT/MLT.** Acronym for Production Logging Tests/Multi-layer Tests.

**plume.** A trail of oil.

**POB.** Acronym for persons on board.

**poikilotopic.** Said of the fabric of an authigenic cement in a sandstone in which the constituent crystals are larger in size than detrital grains, enclose one or more detrital grains, and are in crystallographic continuity throughout more than one intergranular space.

**pore pressure.** The pressure of the interstitial fluids in a rock formation.

**porosity.** The volume of the pore space expressed as a percentage of the total volume of the rock mass.

**pour point.** Lowest temperature at which a substance flows under specified conditions.

**ppb.** Abbreviation for parts per billion.

**PPE.** Acronym for personal protective equipment.

**ppm.** Abbreviation for parts per million.

**Pre-Engineering.** All of the engineering work undertaken before the Project Phase to determine the preferred floating production system for White Rose. Begins with the invitation to submit alliance qualification proposals through selection of the three alliance groups, through selection of the preferred production system and alliance. Includes further definition engineering work with the preferred alliance up to the commencement of the Project Phase.

**pressure gradient.** The rate of pressure increase with depth.

**PRF.** Acronym for probabilistic recovery factory.

**produced sand.** Sand produced with oil and gas.

**progradation (or prograding).** The building forward or outward toward the sea of a shoreline or coastline (as of a beach, delta or fan) by nearshore deposition of river-borne sediments or by continuous accumulation of beach material thrown up by waves or moved by longshore drift.

**Project Phase.** The period beginning with regulatory approval of the Development Application and the Proponent's authorization to execute the White Rose oilfield development, up to the production and offloading of First Oil. Includes detail engineering, procurement, construction, commissioning, installation and development drilling up to First Oil. Does not include development drilling after First Oil.

**PVPI.** Acronym for present value profitability index.

**PVT.** Acronym for pressure, volume, temperature.

**reflection.** The return of a wave or energy incident upon a surface to its original medium. Also, in seismic prospecting, the indication on a record of such reflected energy.

**regression.** The retreat or contraction of the sea from land areas and the consequent evidence of such withdrawal (such as enlargement of the area of deltaic deposition). Also, any change (such as fall of sea level or uplift of land) that brings nearshore, typically shallow-water environments to areas formerly occupied by offshore, typically deep-water conditions, or that shifts the boundary between marine and non-marine deposition (or between deposition and erosion) toward the centre of a marine basin.

**Regulatory Phase.** The period and activities associated with the regulatory review of the Development Application. Commences with the filing of the Development Application and ends upon receipt of approval.

**repeat formation tester (RFT).** A logging tool capable of repeated pressure measurement or sampling in open hole (see also MDT).

**replacement.** The process of practically simultaneous capillary solution and deposition by which a new mineral of partly or wholly differing chemical composition may grow in the body of an old mineral or mineral aggregate.

**reserves.** That part of an identified resource from which a usable mineral or energy commodity can be economically and legally extracted at the time of determination.

**reservoir.** A subsurface, porous, permeable rock body in which oil or gas has accumulated; most reservoir rocks are limestones, dolomites, sandstones, or a combination of these.

**resource.** An initial volume of oil and gas that is estimated to be contained in a reservoir.

**rift.** An elongate structural trough bounded by normal faults formed during crustal extension.

**riser base manifold.** A simple structure located on the seafloor to act as a termination point for the production riser, satellite wells and transfer lines.

**riser.** A flowline carrying oil or gas from the seabed to the deck of a production platform or a tanker loading platform.

**ROR.** Acronym for rate of return.

**ROV.** Acronym for remotely operated vehicle.

**RVP.** Acronym for Reid vapour pressure.

**s.** The abbreviation for second.

**salt dome.** A diapir or piercement structure with a central, nearly equidimensional salt plug, generally one to two kilometres or more in diameter, which has risen through the enclosing sediments.

**sand.** A detrital particle smaller than a granule and larger than a coarse silt grain, having a diameter in the range of 0.0625 to 2 mm.

**sandstone.** Consolidated sediment composed primarily of sand-sized grains.

**SAR.** Acronym for a) Search and Rescue. b) synthetic aperture radar.

**SBM.** Acronym for a) synthetic-based mud or b) Single Buoy Mooring.

**scour.** (a) Seafloor trench caused by the ploughing motion of an iceberg grounding on the ocean floor. (b) Seafloor erosion caused by strong currents, resulting in the redeployment of bottom sediments and formation of holes and channels.

**SCSSV.** Acronym for surface controlled sub-surface safety valve.

**SDL.** Acronym for Significant Discovery Licence.

**sea ice.** Any ice floating in the sea.

**sediment.** Solid material, both mineral and organic, that is being or has been transported from its site of origin by air, water or ice, and has come to rest on the earth's surface either above or below sea level.

**sedimentary rock.** Rocks formed by the accumulation of sediment in water or from air. The sediment may consist of rock fragments or particles, the remains of animals or plants, the product of chemical action or evaporation, or of mixtures of these materials.

**SEIS.** Acronym for Socio-Economic Impact Statement.

**seismic.** Pertaining to, characteristic of or produced by earthquakes or earth vibration.

**seismicity.** The phenomenon of earth movements; seismic activity.

**seismotectonic.** Pertaining to deformation of Earth's crust from shocks not due to volcanic action.

**semi-submersible.** A drilling or production vessel that has the main buoyancy chambers (pontoons) below the active wave zone to provide enhanced vessel stability.

**separator.** A cylindrical or spherical vessel used to separate the components in mixed streams of fluids.

**sequence.** A succession of geological events, processes or rocks, arranged in chronological order to show their relative position and age with respect to the geological history as a whole.

**shale.** Sedimentary rock consisting dominantly of clay-sized particles, an appreciable amount of which are clay minerals.

**shear.** A stress causing or tending to cause two adjacent parts of a solid to slide past one another in parallel to the plane of contact.

**shelf break.** An abrupt change in slope, marking the boundary between the Continental Shelf and the Continental Slope.

**shuttle tanker.** A ship with large tanks in the hull for carrying oil or water back and forth over a short route.

**SI.** Abbreviation for Scates Index or System Internatinal (the metric system).

**siderite.** A mineral,  $\text{FeCO}_3$ , commonly containing also magnesium and manganese.

**sidescan sonar.** A high frequency acoustic method used in ocean bottom mapping. The survey is completed from the side of the survey ship.

**silt.** A detrital particle smaller than a very fine sand grain and larger than coarse clay, ranging from 0.004 to 0.625 mm in diameter.

**siltstone.** Consolidated sediment consisting predominantly of silt-sized grains.

**SO<sub>4</sub>.** Abbreviation for sulphate.

**sorting.** The degree of similarity in grain size of sedimentary particles in a sediment; a measure of the spread or range of the particle-size distribution on either side of an average.

**source rock.** Sedimentary rock in which organic material under pressure, heat and time was transformed into liquid or gaseous hydrocarbons (usually shale or limestone).

**Spider Buoy.** Disconnectable interface between the risers and the FPSO.

**SPM.** Acronym for Single Point Mooring.

**Sr.** Abbreviation for strontium.

**ss [or SS].** The abbreviation for subsea.

**stacked data.** The sum of several seismic traces that have been corrected for moveout and statics.

**stratification.** Division of the water column into layers, or strata, because of differences in water density, structure or temperature.

**stratigraphy.** A branch of geology concerned with the form, arrangement, geographic distribution, chronological succession, composition, correlation and mutual relationships of rock strata, especially sedimentary.

**stratum.** A tabular or sheet-like body or layer of sedimentary rock, visually separable from other layers above and below; a bed. It has been defined as a stratigraphic unit that may be composed of a number of beds, as a layer greater than 1 cm in thickness and constituting a part of a bed, and as a general term that includes both “bed” and “lamination”. The term is more frequently used in its plural form, strata.

**strike.** The direction or trend taken by a structural surface (for example, a bedding or fault plane) as it intersects the horizontal.

**structural culmination.** The highest point of a structural feature.

**subaerial.** Formed, existing or taking place on the land surface.

**submarine canyon.** Steep valley-like submarine depression crossing the continental-margin region. Common on the Continental Slope and Shelf, but some continue across the Continental Rise.

**surficial.** Characteristic of, pertaining to, formed on, situated at or occurring on the Earth's surface; especially, consisting of unconsolidated residual, alluvial or glacial deposits; laying on the bedrock.

**2-D.** Abbreviation for two-dimensional.

**3-D.** Abbreviation for three-dimensional.

**t.** The abbreviation for tonne (a metric ton).

**TBFZ.** Acronym for Trans-Basin Fault Zone.

**TCP.** Acronym for tubing conveyed perforating.

**td.** Abbreviation for total depth.

**tectonic.** Of, or relating to the deformation of the Earth's crust; the forces involved in or producing such deformation, and the resulting forms.

**tectonics.** A branch of geology dealing with the broad architecture of the outer part of the Earth, that is, the regional assembling of structural or deformational features, a study of their mutual relations, origin and historical evolution. It is closely related to structural geology, with which the distinctions are blurred, but tectonics generally deals with larger features.

**template.** Device through which a group of wells is drilled and produced.

**Tertiary.** A period of geologic time from approximately 65 to 2.5 million years ago. The earliest large mammals, grasses and hominids appeared during this period. It is also the period during which most of today's high mountain ranges were formed.

**TIF.** Acronym for test independent failure.

**till.** Non-sorted, non-stratified material (containing particles ranging in size from clay particles to boulders) that has been carried or deposited by a glacier.

**TLP.** Acronym for tension leg platform.

**TLS.** Acronym for target levels of safety.

**topside (or topsides) facilities.** The oil- and gas-producing and support equipment located on the top of an offshore structure.

**TPH.** Acronym for total petroleum hydrocarbons.

**transgressive (or transgression).** Refers to the encroachment of the sea upon the land.

**transport (or transportation).** A phase of sedimentation that includes the movement by natural agents (such as flowing water, ice, wind or gravity) of sediment or of any loose material, either as solid particles or in solution, from one place to another on or near the Earth's surface (for example, the drifting of sand along a seashore under the influence of currents, the creeping movement of rocks on a glacier or the conveyance of silt, clay and dissolved salts by a stream).

**trap.** The mechanism or feature causing hydrocarbon to be retained in a reservoir rock.

**tree.** (a) An arrangement of valves placed on top of a well to control flow from the well. (b) An arrangement of valves and fittings attached to the tubing head to control flow and provide access to the tubing string.

**TSR.** Acronym for temporary safe refuge.

**turret.** A low, tower-like structure capable of revolving horizontally within the hull of a ship and connected to a number of mooring lines and risers. It allows the ship to rotate with the weather while maintaining a fixed mooring system.

**TVD.** Acronym for true vertical depth.

**umbilical.** Device through which control of subsea instrumentation is maintained from the FPSO.

**unconformity.** The structural relationship between rock strata in contact, characterized by a lack of continuity in deposition and corresponding to a period of nondeposition, weathering or especially erosion (either subaerial or subaqueous) before the deposition of the younger beds.

**UPS.** Acronym for uninterruptible power supply.

**VCS.** Acronym for vessel control system.

**VHF.** Acronym for very high frequency.

**viscosity.** The measure of the resistance of a fluid to flow; the lower the viscosity number, the more readily the fluid will flow.

**vitrinite.** A coal maceral group distinguished by a middle level of reflectance higher than exinite but lower than inertinite in the same coal.

**W.** Abbreviation for watt.

**water-based mud (WBM).** A drilling mud in which the continuous phase is water. See drilling mud.

**well workover.** A program of work performed on an existing well; may involve re-evaluating the production formation, clearing sand from producing zones, jet lifting, replacing downhole equipment, deepening the well, acidizing or fracturing, or improving the drive mechanism.

**White Rose Development.** “Development” refers to all phases of the project, from the decision to go ahead with construction through to abandonment of the field.

**WHMIS.** Acronym for Workplace Hazardous Materials Information Systems.

**wireline.** A rope composed of steel wires twisted into strands that are in turn twisted around a central core of hemp or other fibre to create a rope of great strength and flexibility; used to lower and raise logging instruments and bottom line-pressure gauges.

**WOA.** Acronym for Well Operations Authorization.

**WOR.** Acronym for water-oil ratio.

**workover.** Intervention procedure performed on a well involving rig, wireline and/or coil tubing to improve well integrity or well performance.

**yr.** Abbreviation for year.