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PART 17 – OIL AND GAS INDUSTRY

DEFINITIONS

17.01 In this part, the following definitions apply:

“derrick”

means a stationary or portable structure used to support the hoisting and lowering mechanism on a rig;

“hot-work”

means work that involves burning, welding, cutting, grinding, riveting, using fire or spark-producing tools, or other work that produces a source of ignition;

“lower explosive limit”

means the minimum concentration of combustible gas or vapour in air, expressed as a percentage by volume, that ignites if a source of ignition is present;

“rig”

includes the derrick and all equipment directly involved with drilling or servicing a well;

“well”

means an opening in the ground made or being made by drilling, boring, or in another manner.

GENERAL

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| Contingency plan | 17.02 A contingency plan shall be developed and implemented to protect the health and safety of the workers and to deal with any abnormal or emergency situation. The plan shall <ol style="list-style-type: none">(a) include the possibility of release of gases, fire, blow-out, explosion and other common and potential factors and scenarios,(b) be documented properly with<ol style="list-style-type: none">i. the number of workers involved,ii. the steps to be followed, andiii. the equipment required, and(c) be available at the workplace. |
| Worker training | 17.03 Workers involved in the execution of a contingency plan and its required safety measures shall be trained and given the opportunity to rehearse. |
| Transferring flammables | 17.04 (1) When flammable liquids or finely divided materials which are explosive and flammable in nature are being transferred between containers, the containers shall be <ol style="list-style-type: none">(a) in firm contact with each other, and(b) continuously electrically bonded throughout the transfer activity to prevent the accumulation of static electric charges. |
| Bonding | (2) When tanks, mixers or processing vessels are used for flammable or explosive substances, they shall be electrically bonded and grounded while the contents are being transferred. |
| Well heads | (3) A well head shall be used as a ground only <ol style="list-style-type: none">(a) for dissipating static electricity, and(b) if tested and proved acceptable for an electrical distribution system. |
| No smoking | 17.05 (1) There shall be no smoking on or about a rig, within 25 m (80 ft.) of the well |

		bore and within 25 m (80 ft.) of any well, production facility or gas processing plant.
Open flames		(2) There shall be no open flames within 25 m (80 ft.) of the well bore whenever gas may be emitted from the well or any other source.
Iron sulphide	17.06	When iron sulphide is removed from a tank (a) the iron sulphide shall be kept wetted down until safely disposed of, and (b) other contaminated materials and equipment shall be kept wetted down or kept in an inert atmosphere until cleaned.
Control of ignition sources	17.07	(1) Where a regular monitoring and a hot-work permit system are not in use to control ignition sources (a) internal combustion engines shall be shut down within the zone defined by the <i>Canadian Electrical Code</i> and its supplement published by the Safety Codes Council titled <i>Code for Electrical Installations at Oil and Gas Facilities</i> , or other similar standard acceptable to the director as a Class 1 Division 2 or higher hazardous location, unless their operation is integral to the work process, and (b) diesel engines required to operate within the zone defined by the <i>Canadian Electrical Code</i> and its supplement published by the Safety Codes Council titled <i>Code for Electrical Installations at Oil and Gas Facilities</i> , or other similar standard acceptable to the director as a Class 1 Division 2 or higher hazardous location shall have a positive air shut-off or other effective method for engine shut down.
Engine shut-offs		(2) Mobile equipment powered by a diesel engine and used for maintenance or repair work on pressurized gathering, distribution and transmission equipment shall have a positive air shut-off or other effective method of engine shut down.
Lighting flares	17.08	(1) Written safe work procedures shall be developed and implemented to ensure the safety of workers lighting or operating a flare tip, flare stack or flare line. (2) Workers shall be instructed and trained in the application of the written work procedures required by subsection (1). (3) Before workers enter a flare system danger area where the installation is temporary and remote ignition of the pilot is not feasible (a) the flare line shall be isolated, and (b) contaminants in the flare pit area shall be less than 20% of the lower explosive limit.
Flare pits		(4) The location of a flare pit or stack shall not interfere with safe access to the work area.
Continuous system		(5) Where feasible, there shall be a continuous ignition source before flow to a flare pit or stack occurs.
Fire extinguishers / types / numbers	17.09	Non-freezing fire extinguishers, other firefighting equipment and firefighting personnel shall be provided as required by this section and Table 17-1 (a) the minimum requirements for a twin agent unit are i. 1100 litres (250 gal.) premixed ATC foam solution at 6%, ii. 680 kg (1500 lbs.) potassium bicarbonate dry chemical system, iii. 30 m (100 ft.) discharge hose, and iv. two firefighting personnel, (b) the minimum requirements for a continuous foam unit are i. 475 litres (100 imp. gal.) ATC foam concentrate, ii. 680 kg (1500 lbs.) potassium bicarbonate dry chemical system,

- iii. 1900 litres (400 imp. gal.) per minute centrifugal certified fire pump with one 0.065 m (2.5 in.) discharge port, two 0.038 m (1.5 in.) discharge ports, and one 0.125 m (5 in.) suction port, and
 - iv. two firefighting personnel, and
- (c) firefighting equipment must meet the requirements of *NFPA 10, Portable Fire Extinguishers, current edition*, or other similar standard acceptable to the director.

Table 17-1		
Minimum Requirements for Firefighting Equipment		
Work Activity	No. of Extinguishers Required	Type of Extinguisher
Heavy hauler	1	20 – BC
Hot oiler	2	20 – BC
Seismic shot hole drill	2	20 – BC
Drilling rig	4	40 – BC
Service rig	4	40 – BC
Battery operator	1	20 – BC
Fluid hauler	1	40 – BC
Service truck of one-tonne capacity or more	1	20 – BC
Any other commercial vehicle	1	5 – BC
Any vehicle carrying explosives	2	20 – BC
Welder	1	10 – BC
Well testing	2	10 – BC
1 fracturing tank	1	Twin agent unit
2, 3 or 4 fracturing tanks	1	Continuous foam unit with 100-barrel water truck
5 or more fracturing tanks or greater than 40% methanol water fracturing	The fire hazard must be evaluated in accordance with current industry standards, and firefighting equipment and personnel must be provided as determined necessary by the evaluation.	

Alcohol injectors on compressors

- 17.10** (1) Alcohol shall not be added to air lines at the air intake side of a compressor.
- (2) The air in the alcohol injection system shall be bled down to atmospheric pressure before opening an air operating system to inject alcohol.
- (3) Where an air-opening system supplies air for breathing purposes, the alcohol injection system shall be isolated, the system purged of old air, and the air purifying system placed between existing piping and workers using the breathing system.

Piping standards

- 17.11** All pipelines, piping systems, fitting and valves shall
- (a) be designed, constructed and maintained to safely withstand the anticipated maximum internal pressures and external loads,
 - (b) be restrained from undue horizontal, vertical or swinging motion, and
 - (c) meet the applicable requirements of the following standards:
 - i. *CSA Standard Z662-03, Oil and Gas Pipeline Systems,*

- ii. *API Recommended Practice 520, Sizing, Selection, and Installation of Pressure-Relief Devices in Refineries Part 1 – Sizing and Selection, current edition, and Part 11 – Installation, current edition,*
 - iii. *API Recommended Practice 521, Guide for Pressure Relieving and Depressurising Systems, dated November 1990, current edition,*
 - iv. *ASME Standard B31.3-2004, Processing Piping, or*
 - v. other similar standards acceptable to the director.
- Valve disassembly 17.12** (1) When a valve is to be disassembled
- (a) it shall be depressurised, purged, or otherwise made safe, and
 - (b) the related safe work procedures shall be followed.
- Gas operated systems** (2) Process control and power systems shall be designed to operate on the gas being used.
- Hoses and fittings 17.13** (1) Hoses and fittings shall be of a design suitable for the type of service used.
- (2) Quick connect fittings shall be identified or have reliable hardware controls to ensure connection only to the correct service.
 - (3) Quick connect fittings for breathing air service shall be different from, and not compatible with, connection to any other service.
 - (4) Temporary piping and hose systems for hazardous fluids shall be protected from damage.
- Displacement pumps 17.14** (1) A positive displacement pump and attachments shall have valves, pipes and fittings capable of withstanding the pump's maximum working pressure.
- (2) A quick closing type valve shall not be used on the discharge line of a positive displacement pump.
 - (3) A positive displacement pump shall be protected against freezing.
 - (4) A pressure relief device shall be installed on the discharge side of a positive displacement pump, and no valve shall be installed between them.
- Pressure relief devices 17.15** (1) A vessel shall have a pressure relief device set to relieve at a pressure not exceeding 104 kPa (15 psi) if the vessel is
- (a) not registered under the *Boiler and Pressure Vessels Act and Regulations,*
 - (b) connected to a production facility or compressor station, and
 - (c) not directly open to the atmosphere.
- (2) A pressure relief device shall be used to protect a pressurised system, including any lines running from the output side of a pressure relief device that may be subject to an accidental restriction.
- Pressure relief discharge 17.16** (1) A pressure relief device shall be set to discharge at a pressure not exceeding the manufacturer's recommended working pressure for the pipes and fittings in the system, or as specified by a professional engineer.
- (2) Any fluid or material discharged through a pressure relief device shall be piped to a place where it will not endanger workers.
 - (3) The diameter of piping connected to the pressure side and the discharge side of a pressure relief device shall not be smaller than the diameter of the openings of the device.
 - (4) The piping on the discharge side of a pressure relief device shall be
 - (a) secured to prevent movement, and
 - (b) sloped to drain fluids away from the pressure relief device if freezing could restrict fluid flow.

- (5) A pressure relief device that requires block valves by engineering design shall have the block valves locked in the appropriate position.
- (6) A shear pin used in a pressure relief device shall be of a design and strength specified by the device manufacturer.
- (7) A guard shall be installed around the shear pin and spindle of a pressure relief device.
- (8) No valve shall be installed in a discharge opening or pipe on a pressure relief device.

PIPE RACKS

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|----------------------------|---|
| Design | 17.17 (1) Pipe racks and tubs shall be <ul style="list-style-type: none"> (a) designed and constructed to support the maximum load likely to be placed on them, and (b) placed on a level and firm surface. |
| Secure storage | <ul style="list-style-type: none"> (2) Pipe, tubular goods or similar round material shall be prevented from accidentally rolling off a pipe rack. (3) Pipes or tubular goods shall be restrained from uncontrolled movement. |
| Spacers | (4) Spacers shall be used between the layers of pipe or other material on a pipe rack. |
| Deck pins | <ul style="list-style-type: none"> (5) Unless special dunnage is used, deck pins shall be used to restrain pipes and they shall <ul style="list-style-type: none"> (a) be at least 0.45 m (18 in.) high and extend beyond the centre line of the pipe closest to the pins, or (b) extend one pipe diameter above the pipe closest to the pins, if the pipe is tiered. |
| Restraints | (6) Pipes or tubular goods shall be adequately secured before restraining devices are removed. |
| Work on load | (7) While pipe is being loaded, unloaded or transferred, workers shall not be on top of an unsecured load, between the load and pipe racks or tubs, or in any other area made hazardous by potential pipe movement. |
| Temporary supports | (8) Temporary supports or skids shall be constructed, placed and anchored so they will support the load placed upon them when pipe is being transferred between pipe racks, catwalks, or trucks. |
| Pick up subs | (9) Pick up subs or other appropriate pipe handling equipment shall be used when transferring drill collars, tubular goods or other similar materials that are not provided with shoulders. |
| Nubbins | (10) A nubbin shall not be used to pick up drill collars, tubular goods or similar materials unless the nubbin is equipped with a wire rope safety line and swivel for attachment to the elevator bails. |
| Storage trailer | (11) A trailer used as a pipe rack during drilling, servicing, or pipe salvaging shall have a guard along the full length of both sides of the trailer, and the guard shall be designed and constructed to ensure that when a pipe is hoisted into the derrick, the lower end of the pipe will not roll off the trailer. |
| Manual handling | (12) Manual pipe loading, unloading and transferring operations shall be undertaken only from the pipe ends. |
| Loading / unloading | (13) Pipe shall be loaded on or unloaded from a truck one layer at a time. |

- Removing tie downs** (14) The load tie down device preventing the material or equipment from rolling or sliding off a truck or trailer shall not be removed during the unloading operation until the
- (a) lifting slings and the hoist line have been attached to the equipment or material that may slide and roll off, and
 - (b) slack in the hoist line and rigging has been taken up.

GEOPHYSICAL OPERATIONS

- Rig moves** **17.18** The drill mast shall be lowered when the equipment is being moved and there is a danger of
- (a) the mast contacting power lines or other overhead obstructions, or
 - (b) the equipment losing stability.
- Emergency stops** **17.19** (1) A seismic drill shall have an emergency engine-stopping device suitable to working conditions at the site.
- (2) The engine-stopping device shall be clearly identified and be within reach of the drill operator from the drilling position.
- Testing stops** (3) The effectiveness of the engine-stopping device shall be tested daily.
- (4) Two workers shall be present on the same shot hole while drilling.
- Seismic blasting** (5) Seismic blasting shall be carried out following the applicable regulations under Part 14 – Blasting.
- Worker communication** (6) There shall be an effective means of communication between the driver and the worker if a worker is to ride on a seismic line truck to perform work.
- Pipe wrench as tongs** **17.20** Pipe wrenches used as breakout tongs on a seismic rig shall be equipped with a suitable guard on the handle if the provision of the guard does not compromise the integrity of the wrench and is acceptable to the wrench manufacturer.

DRILLING AND SERVICING RIGS

- Foundation** **17.21** (1) The rig foundation shall be capable of safely supporting the gross load of the unit and the maximum anticipated load from the operation, including raising and lowering of the derrick.
- Working area** (2) The work area shall be designed, sized, constructed and laid out so that
- (a) all the required equipment may be safely moved and operated,
 - (b) emergency response activities may be carried out, and
 - (c) anticipated loads will be supported.
- Rig selection** **17.22** (1) The rig selected for use, and the auxiliary equipment, components and subsystems, shall be designed, constructed, installed, operated, and maintained to fulfil their intended purposes safely.
- Operating controls** (2) All operating controls of the rig shall be
- (a) installed at the operator's control panel and clearly labelled as to their individual functions, and
 - (b) adequately protected by a safeguard where there is a danger of accidental engagement of a control.
- Hoist controls** (3) All hoist controls shall be designed to return to their neutral position when released.
- Engine shut downs** (4) An engine shut down device shall be installed at the control panel.

Rig inspection	17.23	<p>(1) Each drilling and service rig shall be inspected every 30 days and repaired in accordance with the following applicable standards published by the Canadian Association of Oilwell Drilling Contractors:</p> <ul style="list-style-type: none"> (a) <i>Recommended Practice 1.0 for Drilling Rigs, Mast Inspection and Certification, January 1, 1994,</i> (b) <i>Recommended Practice 2.0 for Drilling Rigs, Overhead Equipment Inspection and Certification, January 1, 1994,</i> (c) <i>Recommended Practice 3.0 for Drilling Rigs, Mast Inspection and Certification of Masts, January 1, 1994,</i> (d) <i>Recommended Practice 4.0 for Drilling Rigs, Overhead Equipment Inspection and Certification, January 1, 1994,</i> (e) <i>Recommended Practice 1.0A, Addendum for Drilling Rigs, Substructure Inspection and Certification, September 12, 1995, or</i> (f) other similar standards acceptable to the director.
Log books		<p>(2) Inspection and repairs shall be recorded in a Canadian Association of Oilwell Drilling Contractors log book or equivalent log acceptable to the director.</p> <p>(3) The inspection and repair log shall be available on site for review by a safety officer.</p>
Raising, lowering rigs	17.24	<p>(1) The raising and lowering of a derrick shall be done under the direct supervision of the rig manager or other competent person.</p>
Parts inspection		<p>(2) Before raising or lowering a derrick, a competent person shall inspect all the parts.</p>
Specifications for raising / lowering		<p>(3) The raising and lowering of the derrick shall be carried out according to the manufacturer's specifications.</p>
Lift points		<p>(4) When hoisting a mast section, rigging shall be attached to designated lifting points only.</p> <p>(5) Lifting points shall be clearly marked on each mast section of the derrick.</p>
Weight list		<p>(6) A master list of the weight of rig components shall be kept on site.</p>
Operator only		<p>(7) Except for the operator at the controls, workers shall be prohibited from being on, in or beneath a derrick being raised, lowered or telescoped.</p>
SCBA	17.25	<p>On each drilling and service rig there shall be a minimum of one self-contained breathing apparatus in good working order, two together in each of two separate opposite locations, so that two apparatus are always accessible regardless of wind direction.</p>
Blow out preventors	17.26	<p>(1) When installing a blow-out preventer</p> <ul style="list-style-type: none"> (a) the preventer shall be effectively restrained while it is being aligned, and (b) workers shall be prohibited from areas where they may be injured if the preventer swings or drops. <p>(2) When removing a blow-out preventer, two opposing anchor lines shall remain in position until</p> <ul style="list-style-type: none"> (a) the lifting sling is attached to the preventer, (b) the slack in the hoisting line and rigging is taken up, and (c) the draw works brake handle is tied down.
Spudding	17.27	<p>Spudding in shall not start until</p> <ul style="list-style-type: none"> (a) all guards are in place, (b) all platforms, stairways, and handrails are installed and securely fastened,

		(c) the escape line, anchors and safety buggy are installed and inspected, and (d) all connecting pins are secured against dislodgement.
Auxiliary escape	17.28	Each drilling and servicing derrick shall have a specially rigged and securely anchored line as an auxiliary means of escape that (a) provides a ready means of escape from the fourble board, (b) consists of a wire rope not less than 0.013 m (1/2 in.) diameter, (c) has length twice the vertical distance between the ground and the point at which it is attached to the derrick, (d) is effectively anchored and able to withstand a load of 13.3 kN (3000 lbs.), and (e) is kept free of obstructions.
Safety buggy and lines	17.29	(1) Equipment shall not be placed on and vehicles shall not pass under the last 15 m (50 ft.) of the escape line. (2) A safety buggy with a braking device shall be installed and operated on the escape line in accordance with manufacturer's specifications. (3) The safety buggy shall be (a) kept at the derrick hand principal working platform, (b) provided with an effective brake and means to prevent the trolley from coming off the escape line, and (c) inspected by a qualified person at least once a week. (4) The escape line shall be properly installed so that a worker seated in the safety buggy will touch the ground at a safe distance from the derrick, more than 6 m (20 ft.) from the ground-level anchor.
Rig controls	17.30	(1) Where dual purpose controls are used for automatic catheads, a locking device shall be installed to prevent one cathead from being accidentally engaged while the other is operating. (2) The function of each draw works control shall be clearly identified. (3) Before putting the draw works in motion, the worker in charge of the draw works shall ensure that all other workers are clear of the machinery and lines.
Workers clear	17.31	The worker operating the controls for a cathead, draw works, rotary table or other moving equipment shall ensure that all workers are clear of the machinery and lines.
Kelly hose safety lines	17.32	(1) Clamps and wire rope safety lines or chains shall be used to fasten the Kelly hose at the stand pipe end to the derrick and at the swivel end of the swivel housing. (2) Any shock hoses or other hoses that may be subject to pressure surges and whipping shall be restrained by safety lines.
Shock hose safety lines		
Catheads	17.33	Friction catheads shall not be used for hoisting or lifting.
Rig moves	17.34	(1) The driver of a vehicle used for rigging up or tearing up equipment shall not move the vehicle until signalled to move by a qualified person. (2) The person signalling shall ensure that workers are clear of the path of vehicle, load and load line.
Driller's position	17.35	(1) The driller's position on a rig shall be protected from hazards created by the cathead or tong lines.
Rig secured		(2) Every part of the rig, or the equipment attached to it, shall be secured to avoid the possible danger that it could cause by failing, falling or moving.

Cathead / tong lines		(3) The workers on a rig shall be protected from hazards created by the cathead or tong lines.
Rig specifications	17.36	(1) Equipment shall not be operated on a slope exceeding the maximum specified by the manufacturer or a professional engineer.
Snubbing		(2) Where material or equipment must be moved on steep terrain, a written plan shall be prepared before snubbing or yo-yo operations are carried out.
Rig fluids	17.37	(1) Liquids shall be transported in properly designed and constructed tanks or vessels. (2) Where a tank contains or may contain a fluid with hydrogen sulphide as a component, it shall have an external means of gauging its contents. (3) Where manual gauging or sampling is required, the worker involved in the gauging or sampling operation shall (a) use an appropriate supplied air respirator meeting the requirement of the immediately dangerous to life or health (IDLH) atmosphere, and (b) be visually monitored by another worker equipped with an equivalent respirator and capable of effecting a rescue of the worker doing the gauging or sampling work.
Stabbing boards	17.38	(1) A stabbing board shall be provided and used by the worker located above the derrick floor during the running of casing or tubing, or well-servicing operations. (2) A wooden stabbing board shall (a) be fitted with expanded metal or wire rope fastened to the underside and along the full length of the board, (b) have each end of the board secured to the derrick by wire rope of not less than 0.013 m (1/2 in.) diameter, or chain of at least equivalent strength, and (c) be at least 0.3 m (12 in.) wide. (3) A metal platform shall be at least of equal width and strength when used in place of a wooden stabbing board. (4) At the stabbing board, a personal fall protection system shall be attached to (a) a wire rope with a breaking strength of 40 kN (9000 lbs.) stretched across the derrick at a location approximately 2 m (7 ft.) above the stabbing board, (b) a cross-member of the derrick structure at a point approximately 2 m (7 ft.) above the stabbing board, or (c) a solid support secured across the derrick at a location approximately 2 m (7 ft.) above the stabbing board.
Rig buildings and platforms	17.39	(1) Engine rooms, pump houses, derrick floors, and derrick hand platforms shall be enclosed to a sufficient height to provide protection against the weather. (2) When erecting, maintaining or dismantling derrick enclosures (a) safe work procedures shall be developed and implemented, and (b) where practicable, a safe work platform shall be provided. (3) Workers shall not straddle or climb on to a pre-fabricated wall panel during erection, maintenance or dismantling of the derrick enclosures, unless they are belted to a secured section of the prefab. (4) Safe exits shall be provided directly to the outside on each of at least three sides of the derrick floor enclosure. (5) The pump house enclosure shall have at least two doors opening to the outside and located on the different sides of the building.

- (6) Exit doors of a derrick enclosure and the doors of the doghouse shall
 - (a) open outward from the derrick floor, and
 - (b) not be held closed with a lock or outside latch when workers are on the derrick floor.
- Drill stem testing** **17.40**
- (1) Where practicable, before commencing drill stem tests, swabbing, bailing, or displacement with natural gas or oil
 - (a) derrick enclosures shall be altered to provide openings at least 1.8 m (6 ft.) high and 2.4 m (8 ft.) wide on opposite sides above, and on two sides below the derrick floor, or
 - (b) adequate mechanical ventilation or monitoring shall be provided for the areas.
 - (2) Where it is not practicable to provide openings as specified in subsection (1)(a), several openings shall be made providing a total area of at least 4.5 sq. m (50 sq. ft.) on each side.
 - (3) Where mechanical ventilation is used
 - (a) it shall be installed on the mud tank side,
 - (b) it shall be able to completely change the air in the substructure every two minutes, and
 - (c) at least one opening shall be provided in front of the substructure to allow for adequate inflow of makeup air.
 - (4) During cold weather, ventilation procedures shall not compromise the well control systems.
- Contaminated fluids** **17.41**
- (1) Any pit or tank used for the circulation of liquids contaminated with flammable material shall be isolated from sources of ignition.
 - (2) If a pit or tank is enclosed, adequate mechanical ventilation shall be provided to remove the contaminants.
- Derrick ladders** **17.42**
- (1) A derrick ladder shall meet the requirements of *ANSI A14.3-1992, American National Standard for Ladders – Fixed – Safety Requirements*, or other similar standard acceptable to the director.
 - (2) A personal fall arrest system shall be used in place of a ladder safety system,
 - (3) Ladder platforms shall be located as follows
 - (a) on a triple-stand derrick, two or more between the floor and the derrick hand platform, and one or more between the derrick hand platform and the crown,
 - (b) on a double-stand derrick, one or more between the floor and the derrick hand platform,
 - (c) on a single-stand derrick, one platform at the level of the derrick hand platform, and
 - (d) at the crown of each drilling rig.
 - (4) The platforms required by subsection (3) shall be, as far as practicable, equally spaced, but not more than 9 m (30 ft.) apart.
 - (5) The derrick floor and all stairways, ladders, ramps, catwalks and platforms shall be kept free of obstructions that may hinder or prevent the exit of workers.
- Catwalks / ramps** **17.43**
- (1) On each drilling and service rig, a stairway shall be installed beside the ramp, extending from the ground to the derrick floor.
 - (2) The catwalk shall be provided with a stairway at the outer end.

Mud tanks	17.44	<p>(1) Guardrails installed on the walkways and platforms of mud tanks shall have</p> <p>(a) a horizontal top rail not less than 0.9 m (36 in.) nor more than 1.1 m (42 in.) high, and</p> <p>(b) posts or uprights spaced not more than 3 m (10 ft.) apart.</p> <p>(2) Guardrails shall be installed on</p> <p>(a) the outer perimeter of all mud tank hinged wing platforms or walkways, and</p> <p>(b) both sides of the walkways located over mud tanks.</p> <p>(3) Wire rope of not less than 0.01 m (³/₈ in.) diameter or chain of equivalent strength that is substituted for guardrails on mud tank walkways shall be rigged and maintained at the required height and kept taut.</p> <p>(4) Floor openings, elevated walkways and platforms shall have toeboards meeting the requirements of Part 1 – General.</p>
Draw works drum	17.45	A minimum of five full wraps of the hoisting line shall be maintained on the drum of the draw works to eliminate strain on the drum line anchorage.
Travelling blocks	17.46	<p>(1) Travelling blocks, hooks, elevators, elevator links and other units of travelling equipment on a rig shall be free of projecting bolts, nuts, pins or parts.</p> <p>(2) Where a travelling block is being used on a rig, an upward travel limiting device shall be provided to prevent the travelling block from contacting the crown block or structure.</p> <p>(3) The upward travel limiting device required by subsection (2) shall</p> <p>(a) operate by disengaging the hoisting drum from its power source and applying the hoisting drum brake, and</p> <p>(b) be tested on each shift.</p> <p>(4) A travelling block hook to which equipment is directly or indirectly attached shall be equipped with a safety latch or a wire rope safety line.</p> <p>(5) Where bumper blocks are attached to the underside of the crown beams on a rig, a safety cable or equivalent shall be</p> <p>(a) fastened along the full length of the bumper blocks, and</p> <p>(b) secured at both ends to the derrick.</p>
Spooling lines	17.47	A worker shall ensure that when handling moving hoisting lines a secured spooling device is used from a safe location.
Riding hoisting equipment	17.48	<p>(1) A worker shall not ride the travelling block hook or elevators, nor slide down any pipe, Kelly hose, cable or rope line.</p> <p>(2) In an emergency, an injured worker shall only be lowered from the derrick by means of the travelling block or a tigger after the rotary table is stopped and a qualified person operates the controls.</p>
Guards – draw works, rotary table	17.49	(1) Guards of sufficient strength to contain broken parts shall be installed at the draw works and rotary table drives of each rig.
Guards – hoisting drum		(2) Substantial guards of sufficient height shall be installed in front of the hoisting drums on a rig to prevent workers from contacting them.
Guards – headache-posts		(3) Where headache-posts on a rig rotate, the top and bottom ends shall be guarded to contain the post should the shaft fracture.
Fingers secure	17.50	The unsupported ends of derrick hand platform fingers at the fourble board shall be connected to the platform frame by wire rope not less than 0.013 m (¹ / ₂ in.) in diameter, or chain of at least equivalent strength.

Counterweights guarded	17.51	<p>(1) A counterweight located above the derrick floor shall be secured to the derrick frame by a wire rope safety line if it is not fully enclosed or running in permanent guides.</p> <p>(2) The wire rope safety line shall not be less than 0.016 m (⁵/₈ in.) in diameter and be of sufficient length to prevent the counterweight from coming within 2.4 m (8 ft.) of the rig floor.</p>
Weight load indicator	17.52	<p>(1) A drilling rig shall be equipped with a load weight indicator.</p> <p>(2) When a weight load indicator is hung above the floor, it shall be secured by a wire rope or chain safety line.</p>
Draw works brake test	17.53	<p>(1) The brakes on the draw works of a drilling rig, and on a service rig used for drilling, shall be tested at the beginning of each crew shift and inspected at weekly intervals.</p>
Hold-down chain		<p>(2) A hold-down chain, used to secure the draw works brake handle, shall be attached to the brake handle in a manner that prevents accidental disengagement of the chain.</p>
Brake pressure		<p>(3) Loss of brake pressure due to cooling of the brake drum mechanism shall be prevented.</p>
Controls unattended		<p>(4) The operator of the draw works shall not leave the controls unattended while the hoisting drum is in motion, except when drilling.</p>
Automatic feed control	17.54	A drilling rig shall be equipped with an automatic feed control.
Pipes, collars, tubes	17.55	<p>(1) Whenever drill pipes, drill collars or tubing are racked in a derrick, provisions shall be made for the complete drainage of any fluids or gases in the stands.</p> <p>(2) Before drill pipe, drill collar, tubing or casing is run in a well bore, it shall be free from ice plugs or other obstructions.</p> <p>(3) Except while being moved, drill pipes, collars, tubing, casing and rods racked in a derrick shall be secured at the top end by means of tieback ropes or equivalent devices to prevent them from falling out of or across the derrick.</p>
Mud cans	17.56	Whenever a wet joint or stand of pipe or tubing is being unscrewed and disconnected above the derrick floor, a mud can shall be used to convey any liquids through a pipe to the mud tank or sump.
Rotary tongs	17.57	<p>Rotary tongs shall have</p> <p>(a) a primary safety device to prevent uncontrolled movement of the tongs, and</p> <p>(b) a secondary safety device that will activate if the primary device fails.</p>
Rotary table	17.58	<p>(1) When visibility on the rig floor is obscured, workers shall not work there while the rotary table is in motion.</p> <p>(2) Hoses, lines or chains shall not be operated or handled near a rotary table in motion.</p> <p>(3) The rotary table shall not be engaged until all workers are clear of the rotary table.</p> <p>(4) Rotary table motion shall not be used for the final make up or initial breaking out of a pipe connection.</p>
Fuel storage	17.59	Gasoline or other liquid fuel shall not be stored within 25 m (80 ft.) of a well, except for fuel in the primary supply tanks of operating equipment.
Guylines	17.60	<p>(1) Derrick guylines shall be secured to adequate ground anchors.</p>

- (2) Derrick guylines and ground anchors shall be installed according to the requirements of
 - (a) the manufacturer,
 - (b) a professional engineer,
 - (c) the *American Petroleum Institute Recommended Practice RP 4G-1992, Maintenance and Use of Drilling and Well Servicing Structures, First Edition, January 1, 1992*, or
 - (d) other similar standard acceptable to the director.
- (3) Permanent ground anchors shall be designed and installed so they are effective all year round.
- (4) Temporary ground anchors shall be pull tested before initial use and, if they continue to be used, tested annually and whenever they may have been affected by seasonal changes.
- (5) The manufacturer's specifications for the correct number of guylines and spacing shall be legibly marked on a plate affixed to the derrick, or on a specification sheet posted at the rig.
- (6) Documentation shall be available on site showing that the ground anchors meet the requirements of this section, and the documentation shall be signed by the person responsible for the adequacy of the anchors.

DRILL STEM TESTING, SWABBING, CEMENTING, WELL SERVICING AND STIMULATION

- | | | |
|--------------------------|--------------|--|
| Procedures | 17.61 | (1) Drill stem testing procedures shall conform to <i>Alberta Recommended Practices for Well Testing and Fluid Handling, ARP 4.1 Drill Stem Testing, June 1993</i> , or other similar standard acceptable to the director. |
| Ignition sources | | (2) During drill stem testing <ol style="list-style-type: none"> (a) motors and engines, or other sources of ignition not required for the operation shall be shut off, and (b) motor vehicles shall not be permitted within 25 m (80 ft.) of the well bore. |
| Worker training | | (3) The workers involved in a drill stem test shall be trained to carry out their responsibilities during the test. |
| Liquid recovery | | (4) Where liquids are recovered during drill stem tests <ol style="list-style-type: none"> (a) the liquids shall be reverse circulated from the drill pipe, and (b) prior to reverse circulating, drill pipe shall be pulled from the hole and test plugs used on every disconnected joint of drill pipe until well fluids are encountered at the surface, or (c) where reverse circulation is not practicable due to a failure of the pump out sub, the drill pipe shall continue to be tripped out of the hole under the supervision of a competent person, using test plugs and a mud can. |
| Hours of darkness | | (5) Where test fluid recovery is encountered during darkness <ol style="list-style-type: none"> (a) the liquids being recovered shall be reverse circulated, and (b) where reverse circulation is not practicable due to failure of the pump out sub, additional drill pipe shall not be pulled or disconnected until daylight. |
| Fluids | | (6) Whenever oil, water or gas has been encountered during drill stem testing <ol style="list-style-type: none"> (a) tests for the presence of hydrogen sulphide shall be done, and (b) where hydrogen sulphide is found, the sour fluids encountered shall be reverse circulated to a vented tank located at least 50 m (165 ft.) or more from the well, or to a flare pit. |

Hydrogen sulphide monitors	17.62	<p>(1) Where hydrocarbons or hydrogen sulphide may accumulate, hydrogen sulphide and hydrocarbon monitors shall be installed with an alarm system to go off at pre-set levels.</p> <p>(2) The hydrogen sulphide monitor shall be</p> <ul style="list-style-type: none"> (a) capable of detecting hydrogen sulphide at a concentration of 15 milligrams per cubic metre (10 ppm) of air, (b) calibrated and tested before use, and (c) maintained to provide accurate measurement.
Swabbing at night	17.63	<p>When swabbing at night</p> <ul style="list-style-type: none"> (a) auxiliary lighting providing a minimum illumination of 54 lux (5 fc) measured 0.5 m (20 in.) above the travelled surface shall be provided, (b) any lighting on a rig that is not explosion-proof shall be turned off, (c) a sandline depthometer shall be used to supplement the sandline flags, (d) the sandline flags shall be illuminated and acid resistant, (e) illuminated wind direction indicators shall be placed at appropriate locations around the site, and (f) a well site supervisor shall remain on site at all times.
Swabbing tanks	17.64	<ul style="list-style-type: none"> (1) A swabbing tank shall have an external means of gauging its contents. (2) Fluids used in or resulting from swabbing shall be piped directly through a degasser to a battery, skid tank, mobile trailer tank or tank truck located 50 m (165 ft.) or more from the well bore. (3) Where fluids used in or resulting from swabbing are being piped into a tank truck, the tank truck engine shall be shut off and the driver shall not remain in the truck cab.
Well service Equipment location	17.65	<p>During well servicing</p> <ul style="list-style-type: none"> (a) the air intake and exhaust of the pump motor shall be located 6 m (20 ft.) from the rig tank while the pump is circulating hydrocarbons, and (b) the tank truck shall be located on the far side of the rig tank from the well bore and at a distance 6 m (20 ft.) from the rig tank during loading and unloading.
Well stimulation	17.66	<ul style="list-style-type: none"> (1) Flow piping systems shall be anchored during well testing or stimulation. (2) A quality assurance program shall be developed and implemented to ensure the integrity of the piping system. (3) The quality assurance program shall include routine inspections, non-destructive testing, identification of the piping components, and piping specifications that meet the service application. (4) Where swivel joints are used in the piping system, the source and discharge end of the piping system shall be secured in a manner that prohibits whipping or flailing of the pipe in the event of separation of the pipe from the source or discharge end. (5) Where swivel joints or hoses are used in well stimulation and similar operations, except well testing, the piping system shall be secured at the well head and supply vehicle or pumping unit end with wire rope safety lines not less than 0.011 m (⁷/₁₆ in.) diameter, or with chains of equal strength. (6) Flow-back lines shall be anchored and restrained. (7) Where a system of piping and swivel joints with a pressure greater than 2000 kPa (300 psi) is used in well stimulation and similar operations, except well testing

- (a) the operation shall be conducted by remote control,
 - (b) unauthorized workers shall not enter the area between the point of discharge and the well head, and
 - (c) before starting operations, warning signs shall be posted in the area stating "DANGER, NO UNAUTHORIZED WORKERS ALLOWED IN THIS AREA", or other similar language.
- (8) In a flow piping system exceeding 3500 kPa (500 psi)
- (a) connections shall be welded, flanged or hammer union, and
 - (b) where there is only a threaded connection available at the well head, special precautions shall be taken to ensure the required safety.
- (9) A piping system shall be completely depressurised before leaking connections or fittings are attended to.
- (10) Hammering on a pressurised system shall not be permitted.
- (11) Welding of high pressure pipes or fittings shall be done in accordance with the manufacturer's specifications and instructions.
- (12) Where liquid carbon dioxide or other liquefied gas is used for well stimulation, the valve controls of the supply unit shall be on the side opposite to the pipe supplying the liquefied gas.
- Hoses, pipes** **17.67** (1) Only metal piping or flexible hose designed for high pressure services shall be used between a service pump and the well head.
- (2) A check valve shall be installed at the well head end of the piping.
- (3) A bleed-off valve shall be installed between the check valve and the well head.
- High risk fluids** **17.68** Where it is necessary to replenish the pumping unit supply with high risk fluids, the filling line from an auxiliary tank shall be piped directly to the suction end of the pump, and not into the pumper truck.
- Hydrostatic testing** **17.69** (1) Before commencing a service operation, piping, pumps, valves and fittings to be used in the operation shall be hydraulically tested to a pressure 10% above the maximum anticipated operating pressure as determined by the well owner.
- (2) Before commencing well testing flowback operation, flow line piping, valves and fittings from the well head to the first pressure control choke shall be hydraulically pressure tested to a pressure more than 10% above the maximum anticipated shut-in pressure as determined by the well owner.
- Use of nitrogen** (3) When nitrogen is being used to pressure test the piping system, the nitrogen treating line shall be connected to the main line as close to the well as practicable.
- (4) Documentation of the testing shall be available at the workplace for inspection by a safety officer.
- (5) Air shall be purged from the piping system before pressurizing low flash point hydrocarbons.
- Hot oil** **17.70** The vent line used in hot oiling operations shall discharge a minimum of 10 m (33 ft.) from sources of ignition.
- Electrical grounding** **17.71** During drill stem testing, swabbing, cementing, well servicing or stimulation, electrical continuity between items of equipment shall be maintained, and the entire system shall be grounded.

PRODUCTION AND PLANT OPERATIONS

- Draining to flare pits** **17.72** Unless the system is designed and constructed to prevent flashback, sources of ignition in the flare pit and surrounding area shall be extinguished while a vessel is being completely drained to the flare pit and the pressure in the vessel is 35 kPa (5 psi) or less.
- Piping** **17.73** Pipes connecting a vessel to a flare system shall be blanked off and hoses disconnected
- (a) before work is performed within the vessel, and
 - (b) during treater refilling operations.
- Dikes, retaining walls** **17.74** (1) Retaining walls and diked areas shall be provided with safe access and egress.
- (2) Workers shall not enter a diked area unless
 - (a) effective measures, including testing, have been taken to protect workers if hydrogen sulphide may be present,
 - (b) testing for flammable gases and vapours, oxygen deficiency and harmful air contaminants is done if there are leaks or spills that may present a hazard to workers, and
 - (c) testing for flammable gases and vapours is done before hot work takes place.
 - (3) Testing shall be done for hydrogen sulphide before entry to any diked area where sour fluid is stored.
- Vehicles unloading hydrocarbons** **17.75** (1) A tank truck shall be electrically bonded and grounded when loading and unloading hydrocarbons.
- (2) The ground conductor required by subsection (1) shall remain bonded and grounded until all other connections have been removed.
 - (3) Servicing or maintenance shall not be carried out on a tank truck when loading or unloading hydrocarbons except for required greasing of the pump.
 - (4) Chocks shall be used to secure a tank truck while loading and unloading hydrocarbons.
 - (5) Other vehicles shall not be started or shut off within 8 m (25 ft.) of a tank truck containing flammable vaporizing liquids while it is being connected or disconnected.
 - (6) When a tank truck is being loaded through a dome hatch and it is necessary to observe the fluid level
 - (a) a platform shall be provided for the loader,
 - (b) shut-off controls shall be located at the platform,
 - (c) illumination in accordance with the requirements of the *Occupational Health Regulations* shall be provided during hours of darkness, and
 - (d) the loading spout shall extend to within 0.15 m (6 in.) of the tank bottom.
- Pressurized truck tanks** **17.76** (1) When a tank truck tank is pressurized as part of the unloading process
- (a) written safe work procedures shall be provided for and followed by the operator,
 - (b) the truck shall be fitted with a pressure relief valve, regulator, pressure gauge and a mechanism for quickly shutting off supply to the tank, and
 - (c) controls shall be readily accessible to the operator.
- Hydrogen sulphide** **17.77** Tank trucks or loading facilities shall have necessary safety provisions for protecting workers from the danger of hydrogen sulphide if it is present.

- Valve wrenches** **17.78** (1) Valve wrenches shall be constructed to an adequate engineered design.
- (2) Snipes or extensions shall not be applied to valve or pipe wrenches, except by design.

CLEANING AND REPAIRING TANKS OR VESSELS

- Entering confined spaces** **17.79** (1) Where it is not practicable for a worker entering a confined space to use a lifeline due to internal piping or other obstructions, the worker shall wear a full body harness.
- (2) Where a lifeline is not used, two workers shall be
- (a) equipped with respiratory protective equipment,
- (b) capable of effecting a rescue if required, and
- (c) stationed immediately outside the entrance to the confined space.
- Testing, ventilating** **17.80** (1) After a vessel or tank has been cleaned, and before further work is performed
- (a) the vessel or tank shall be ventilated and tested for toxic and flammable substances and oxygen deficiency, and
- (b) repeat tests shall be made while work is in progress.
- Purging** (2) Where necessary to ensure the safety of workers, steam or an inert gas shall be used to purge flammable substances from tankers, tanks, vessels or piping prior to any cutting or welding operations.
- Services** (3) Services shall be placed through the top access way of a tank or vessel or, where this is not practicable, the services must be protected from damage.
- Equipment** (4) Equipment or fire extinguishers shall not cause a hazard to workers in the tank or vessel.
- Openings secured** **17.81** (1) Primary entry ways and ventilation openings shall be effectively secured in the open position before entry into a confined space is allowed.
- Electrical** (2) Electrical equipment used in confined spaces shall be supplied with power through an approved ground fault circuit interrupter.
- Resuscitation** (3) An oxygen powered resuscitator shall be provided at a site where a worker may be injured and entrapped in a toxic atmosphere.

GAS SAMPLE CONTAINERS

- Standards** **17.82** (1) Gas sample containers shall meet the requirements of *CSA Standard B339-88, Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods*, or other similar standard acceptable to the director.
- (2) Gas sample containers shall be used in accordance with *CSA Standard B340-88, Cylinders, Spheres, and Tubes, and Other Containers for the Transportation of Dangerous Goods, Class 2*, or other similar standard acceptable to the director
- Containers** **17.83** (1) A pressure relief device shall not be installed on any gas sample container.
- (2) Valves shall be screwed directly into gas sample containers.
- (3) Plugs shall be used in the gas sample container valves.

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