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G23.4 Coordination of multiple-employer workplaces – Owner

Issued August 1999; Editorial Revision June 14, 2013; Editorial Revision April 6, 2020

Regulatory excerpt
Section 23.4 of the *OHS Regulation* ("*Regulation*") states, in part:

> (1) If an activity involves the work of 2 or more employers or their workers, each employer must notify the owner, or the person engaged by the owner to be the prime contractor, in advance of any undertaking likely to create a hazard for a worker of another employer.
>
> (2) If a work location has overlapping or adjoining work activities of 2 or more employers that create a hazard to workers,
>
> (a) the owner, or if the owner engages another person to be the prime contractor, then that person, must
>
> …

Section 13 of the *Workers Compensation Act* ("*Act*") defines "owner" as including

> (a) a trustee, receiver, mortgagee in possession, tenant, lessee, licensee or occupier of any lands or premises used or to be used as a workplace, and
>
> (b) a person who acts for or on behalf of an owner as an agent or delegate;

Purpose of guideline
This guideline explains who is typically the owner of an oil and gas plant.

Owner
The "owner" for the purpose of Part 23 is commonly termed the "operator," meaning the owner of the plant and of the license under which the operation runs. The fact that this person subcontracts the operation of the facility and has no workers at the site does not affect their status as "owner."

Additional obligations are placed on the owner by sections 23.31, 23.63, and 23.72 of the *Regulation* as well as owner obligations under the *Act*.

G23.5 Safe work procedures

Issued August 1999; Editorial Revision September 6, 2018

Regulatory excerpt
Section 23.5 of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must identify the work activities or circumstances, including releases of gases, that have caused or may cause significant risk of injury or occupational disease to workers.
>
> (2) The employer must analyze the risks arising out of the work activities or circumstances identified under subsection (1) and implement safe work procedures if the activities or circumstances create a hazard.
>
> (3) The procedures implemented under subsection (2) must state the number of workers involved, the steps to be followed and the safety equipment required.

Purpose of guidelines
The purpose of this guideline is to outline that measures taken by the employer under this section must be consistent with the other sections of the *Regulation*.

Industry recommended practices
Consideration should be given under section 23.5 to recommended practices for safe work developed by recognized industry associations. These include the Industry Recommended Practices (IRPs) of the Drilling and Completions Committee (DACC) of Energy Safety Canada.

G23.8 Control of ignition sources

Issued August 1999; Editorial Revision June 14, 2013

Regulatory excerpt
Section 23.8 of the *OHS Regulation* ("*Regulation*") states, in part:

> (1) If regular monitoring and hotwork permits are not in use to control ignition sources
>
> …
>
> (b) diesel engines required to operate within the zone defined by the BC Electrical Code and the Drilling and Production Regulation as a Class 1 Division 2 or higher classification must have a positive air shutoff or other effective method for engine shut down.
>
> (2) Mobile equipment powered by a diesel engine and used for maintenance or repair work on pressurized gathering, distribution and transmission equipment must have a positive air shutoff or other effective method of engine shut down.

Purpose of guideline
This guideline gives examples of other effective methods for engine shut down.

Other effective methods for engine shut down
Some effective methods for engine shut down, other than a positive air shutoff include the following:

- A system for injecting inert gas into the engine's cylinders, equipped with a readily accessible remote control
- A suitable duct so that air for the engine is obtained at least 25 metres from a well (this allows shutting off the fuel to effectively stop the engine)

G23.9(5) Flare pits and flare lines – Ignition sources

Issued August 1999; Editorial Revision June 14, 2013

Regulatory excerpt
Section 23.9(5) of the *OHS Regulation* ("*Regulation*") states:

> If feasible, there must be a continuous ignition source before flow to a flare pit or stack occurs.

Purpose of guideline
This guideline gives examples of additional ignition sources that are acceptable during drill stem testing.

Ignition sources
During drill stem testing, it is acceptable to use a lit tiger torch, diesel soaked bag of sawdust, or a burning pail of fuel, as a continuous ignition source, prior to flowing to the flare.

G23.10 Fire extinguishers – Fracturing

Issued August 1999; Editorial Revision June 14, 2013; Editorial Revision November 21, 2017

Regulatory excerpt
Section 23.10(1) of the *OHS Regulation* ("*Regulation*") states:

> Non-freezing fire extinguishers, other firefighting equipment and firefighting personnel must be provided as required by subsections (2), (3) and (4) and Table 23-1.

Table 23-1 of the *Regulation* states, in part, that:

Work activity	Number of extinguishers required	Type of extinguisher
…		
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.	

Purpose of guideline
This guideline explains the firefighting equipment requirements for fracturing using hydrocarbon-based fluids.

Fracturing using hydrocarbon-based fluids
The firefighting equipment specified for fracturing jobs in Table 23-1 is required when fracturing using hydrocarbon-based fluids is done. The current industry standards for fire protection equipment can be found in Energy Safety Canada's DACC (Drilling and Completions Committee) Industry Recommended Best Practice (IRP) Volume #08 — Pumping of Flammable Fluids (2016) available at

https://www.energysafetycanada.com/_Resources/DACC-IRP-Volumes/DACC-IRP-VOLUME-08-PUMPING-OF-FLAMMABLE-FLUIDS.

G23.14(5) Pressure control measures at pumping wellheads

Issued January 1, 2007

Regulatory excerpt
Section 23.14(5) of the *OHS Regulation* ("*Regulation*") states:

> For a wellhead utilizing a down-hole positive displacement pump, the employer must implement measures to prevent the pump from causing pressures exceeding the pressure rating of the system.

Purpose of guideline
This guideline describes what is meant by the "measures" referenced in section 23.14(5) and outlines an example of an acceptable set of measures. The measures deal with the parts of the system that can be over-pressurized as a direct result of a down-hole positive displacement pump not being shut down when necessary, and with the associated pressure sensors.

Control measures
Appropriate control measures will ensure that a down-hole positive displacement pump does not cause pressure exceeding the design pressure of the system. They will typically include a combination of equipment, procedures and training.

The measures are to be effective. That is, they will provide at least the same level of safety and reliability as the applicable design codes for pressure safety valves if such valves were used to ensure that the design pressure was not exceeded.

An appropriate set of measures will address the following four matters:

1. Keyed locks or seals to physically prevent tampering with the settings of the pressure sensor switch that is part of the well shut-in safety system and any valve that may interfere with the correct operation of the sensor.
2. Procedures to ensure that locks or seals that restrict access to the pressure sensing and emergency shutdown system may only be removed with the prior permission of a supervisor.
3. Procedures to ensure that access to the emergency shutdown overpressure system is only permitted for purposes of maintenance or testing of that system, while using accurate gauges to monitor pressures.
4. Procedures and training to ensure the safety of field service workers and to prevent unauthorized changes to the pressure sensor and overpressure emergency shutdown system.

To be effective, the measures must be fully implemented and maintained, and workers must receive appropriate training on the control measures.

G23.15(1)(a) *Power Engineers and Boiler and Pressure Vessel Safety Act* repealed

Issued August 13, 2008; Retired consequential to February 1, 2012 Regulatory Amendment

G23.22 Driver training

Issued August 1999; Reissued on January 1, 2009; Revised March 31, 2015; Editorial Revision November 21, 2017; Revised March 11, 2021

Regulatory excerpt
Section 23.22 of the *OHS Regulation* ("*Regulation*") states:

> A vehicle driver in the oil and gas industry must, before operating a vehicle with a gross vehicle weight rating greater than 5 500 kg (12 000 lbs.),
>
> (a) be certified in the applicable Energy Safety Canada driver training course acceptable to the Board, or
>
> (b) have completed driver training providing skills and knowledge for safe driving equivalent to or better than those required by paragraph (a).

Purpose of guideline
The purpose of this guideline is to identify the Energy Safety Canada driver training course that has been evaluated and is acceptable to WorkSafeBC, and to provide information on driver training providing equivalent or better skills and knowledge.

Acceptable Energy Safety Canada course
The Oilfield Driver Awareness (ODA) course from Energy Safety Canada is currently the only course acceptable to WorkSafeBC for oilfield drivers operating vehicles with a gross vehicle weight rating greater than 5,500 kilograms.

Course description and information about enrollment is available on the Energy Safety Canada website.

Equivalent driver training
Section 23.22(b) of the *Regulation* allows for alternative driver training providing skills and knowledge for safe driving are equivalent to or better than those required by Energy Safety Canada's training course. Further information is available on the WorkSafeBC Oilfield driver training webpage.

Certification Services can also provide assistance to employers in evaluating whether another driver training course provides skills and knowledge equivalent to or better than the acceptable Energy Safety Canada course.

G23.26 Gauging – Safe access

Issued August 1999; Editorial Revision June 14, 2013

Regulatory excerpt
Section 23.26 of the *OHS Regulation* ("*Regulation*") states:

> A tank which contains or may contain a fluid with hydrogen sulfide as a component must have an external means of gauging its contents, or if manual gauging or sampling is required, the worker doing the gauging or sampling must use a supplied air respirator meeting the requirements of Part 8 (Personal Protective Clothing and Equipment) for use in an IDLH atmosphere, and must 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.

Section 4.32 of the *Regulation* states:

> There must be a safe way of entering and leaving each place where work is performed and a worker must not use another way, if the other way is hazardous.

Purpose of guideline
This guideline explains the need for a safe way to access the top of the tank if manual gauging is used.

Manual gauging
Some external gauges do not provide the accuracy of manual gauging. When manual gauging is used, access to the top of the tank and stability of the worker may be a problem. In order to provide a safe means of gauging, an effective external gauge should be provided. If manual gauging is used, in addition to the requirements of section 23.26 the employer must provide a safe way of accessing the top of the tank. This should either be a stairway with a platform or a ladder safety device that provides work positioning and effective rescue capacity.

G23.39.1 Emergency escape systems for snubbing units

Issued April 9, 2009; Editorial Revision November 21, 2017

Regulatory excerpt
Section 23.39.1 of the *OHS Regulation* ("*Regulation*") states:

> A drilling or service derrick must have an emergency means of escape from the racking board that complies with section 23.39.2 or 23.39.3.

Purpose of guideline
The purpose of this guideline is to provide guidance with respect to emergency escape systems on snubbing units.

Section 23.39 does not apply to snubbing units
Regulation sections 23.39.1, 23.39.2, and 23.39.3 do not apply specifically to snubbing units in the oil and gas industry. A snubbing unit is not considered to be a drilling or service derrick for the purposes of this section.

Safe means of egress from a snubbing unit
Although *Regulation* section 23.39 does not apply to snubbing units, there are other requirements for emergency egress, including the following two sections.

Regulation section 4.13 specifies that employers need to conduct a risk assessment in any workplace in which a need to rescue or evacuate workers may arise, and then develop and implement appropriate written procedures as necessary.

Regulation section 4.14(1) specifies that an emergency means of escape be provided from any work area in which the malfunctioning of equipment or a work process could create an immediate danger to workers and the regular means of exit could become dangerous or unusable.

Energy Safety Canada's DACC (Drilling and Completions Committee) Industry recommended Best Practice *(IRP) Volume #15 — Snubbing Operations (2015)* section 15.3.1.6 references slide poles on either side of the working platform for emergency escape. The *IRP* also calls for implementation of safer means of escape where the pole is not a viable egress option (e.g. high wellhead configurations). A Petroleum Services Association of Canada snubbing committee is researching emergency egress systems that provide quick deployment, are mobile, and are adaptable for rig in/out in the variety of environments in which rig assist snubbing units are used. Employers need to keep current with these developments and with the technological advancements for emergency egress from snubbing baskets, and employ more advanced and safer means of escape as they become available.

G23.39.2 Auxiliary escape

Issued August 1999; Editorial Revision January 1, 2009

Regulatory excerpt
Section 23.39.2(1)(d) of the *OHS Regulation* ("*Regulation*") states:

> (1) A drilling or service derrick must have a specially rigged and securely anchored line as an emergency means of escape that
>
> (d) is effectively anchored and able to withstand a load of 13.3 kN (3,000 lbs)

Purpose of guideline
The purpose of this guideline is to clarify what is meant by effectively anchored under section 23.39.2(1)(d) of the *Regulation*.

Effectively anchored
An anchor is effective if it will prevent the line from failing unless the load applied exceeds the anchor capacity. The employer must take measures to ensure the anchor is effective (see section 4.2). Measures to ensure the effectiveness of an anchor include:

- Pull testing the anchor and documenting the test results
- Using an auger/screw anchor set to a given depth and torque
- Using a manufactured or engineer designed anchor system

In the case of the latter two items, standard drawings from the manufacturer or an engineer should be available.

G23.43 Ventilation openings

Issued August 1999; Revised February 11, 2004; Revised April 15, 2021

Regulatory excerpt
Section 23.43(1) of the *OHS Regulation* (*"Regulation"*) states:

> (1) Before commencing drill stem tests, swabbing, bailing, or displacement with gas or oil
>
> (a) derrick enclosures must 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 2 sides below, the derrick floor, or

(b) adequate mechanical ventilation or monitoring must be provided.

Purpose of guideline
The purpose of this guideline is to clarify the phrases "displacement with gas or oil" and "monitoring" in section 23.43(1) of the *Regulation.*

Displacement with gas or oil
For the purpose of this section, "displacement with gas or oil" includes underbalanced drilling when temperatures are within 10 degrees of the flash point.

Monitoring
Section 23.43(1)(b) of the *Regulation* allows the option of "monitoring. If this option is used, safe work procedures (section 23.5) must be in place before commencing drill stem tests, swabbing, bailing, or displacement with gas or oil. WorkSafeBC accepts the following procedures as complying with section 23.43(1)(b):

A. In addition to routine monitoring, instantaneous stationary monitors will normally be installed:

- At the flow nipple in the substructure for lower explosive limit (LEL) detection
- At floor level in the substructure for hydrogen sulfide (H_2S) detection
- At the designated entrance to the substructure for LEL and H_2S detection

All alarms are clearly audible exterior to the substructure.

B. Procedures for gas alarm response as follows:

1. The employer, prime contractor, or owner if there is no prime contractor, must ensure appropriate personnel are able to:
    - Install, inspect, maintain and operate personal protective equipment and air monitoring systems
    - Provide safety orientation
    - Conduct safety briefings
    - Conduct emergency drills
    - Maintain rig location personnel count
2. Personal protective equipment and air monitoring systems are installed and function tested prior to doing drill stem tests, swabbing, bailing, or displacement with oil or gas.
3. Fire resistant clothing (coveralls, wet suits) are worn throughout the course of testing, from tool opening through initial circulation following testing, and during swabbing, bailing or displacement with oil or gas. Appropriate underclothing (for example, 100% tight weave cotton) is worn and hard hat liners are fire resistant.
4. Continuous gas monitoring is in effect prior to commencing drill stem tests, swabbing, bailing, or displacement with oil or gas. An initial warning alarm will activate when H_2S exceeds the action limit of 5 ppm (50% of the ceiling limit of 10 ppm) and a full alarm at 9 ppm for workers to evacuate and explosive gas exceeds 10% of LEL. As a minimum, portable 3-gas monitors, which measure oxygen, H_2S, and LEL, are acceptable. Alarms will be perceptible throughout the rig and clearly audible by personnel in the vicinity.

    Workers will not enter or remain in areas of the rig where harmful substances exceed limits listed in the Table of Exposure Limits for Chemical and Biological Substances (refer to OHS Guideline G5.48-2). In particular, sections 5.31 and 5.56 must be considered.

5. Emergency procedures will be developed and followed in the event of an alarm situation (H_2S gas concentration exceeds 10 ppm and LEL concentration exceeds 20%.) The following is an example of a minimum acceptable procedure:
    - All personnel will don breathing apparatus and evacuate immediately upwind to the designated safe briefing area. All personnel on location will be notified and accounted for. A head count will be completed and rescue teams dispatched as warranted.
    - The site supervisor in consultation with the rig manager will determine to what extent rig power can safely be de-energized in the areas of the cellar, substructure, rig floor, derrick and doghouse.
    - Trained personnel (equipped with a portable and/or personal multi-gas monitor complete with probe) will proceed to remotely de-energize and lockout electrical components for areas where prefabs are to be removed. Electrical cords or switches will not be de-energized at source; rather, main breakers and locks will be used.
    - When non-essential rig power has been de-energized, trained personnel will remove prefabs in the affected areas if safe to do so.
    - Trained personnel equipped with a portable and/or personnel multi-gas monitor, complete with hose and probe, will provide emergency and/or rescue support.
    - Workers will not enter into or remain in an area containing 20% of LEL or greater except as permitted under section 5.31(d) of the *Regulation*.
6. Following drill stem testing, the pipe contents will be reverse circulated to flare in accordance with CAPP Drill Stem Testing Safety Guidelines (1984). Continuous monitoring will be in place until the drill string is circulated bottoms up at least twice.
7. If tests indicate that the substructure or derrick enclosures have to be removed for adequate ventilation all crewmembers will wear:
    - Fire resistant clothing
    - Pressure demand SCBA
    - Portable monitors to ensure the LEL remains below 20%
8. Workers will be trained in the following:
    - Use of air monitoring equipment and testing procedures
    - Use of personal protective equipment

- Safe removal of the substructure or derrick enclosure for adequate ventilation

G23.60 Rotary tongs

Issued August 1999; Editorial Revision March 11, 2021

Regulatory excerpt
Section 23.60 of the *OHS Regulation* ("*Regulation*") states:

> Rotary tongs must have
>
> (a) a primary safety device to prevent uncontrolled movement of the tongs, and
>
> (b) a secondary safety device that will activate if the primary device fails.

Purpose of guideline
The purpose of this guideline is to describe the wire rope safety lines used as a safety device for rotary tongs.

Description
Single stand rigs should use two wire rope safety lines, not less than 1/2 inch (13 mm) in diameter. Larger rigs should use two wire rope safety lines, not less than 5/8 inch (16 mm) in diameter.

G23.61 23.5, and 12.3 Safeguarding at the rotary table area of drilling and service rigs

Issued October 26, 2005

Regulatory excerpt
Section 23.61 (Rotary table) of the *OHS Regulation* ("*Regulation*") states:

> (1) If visibility on the rig floor is obscured, workers must not work there while the rotary table is in motion.
>
> (2) Hoses, lines or chains must not be operated or handled near a rotary table while it is in motion.
>
> (3) The rotary table must not be engaged until all workers are clear of the rotary table.

Section 23.5 (Safe work procedures) of the *Regulation* outlines the employer's obligations to identify and analyze risks at operations in the oil and gas sector, and to develop appropriate safe work procedures to address hazards.

Section 12.3 (Standards) of the *Regulation* states:

> The application, design, construction and use of safeguards, including an opening in a guard and the reach distance to a hazardous part, must meet the requirements of *CSA Standard Z432-94, Safeguarding of Machinery*.

Purpose of guideline
The provisions of section 23.61 are straightforward. However, there are difficulties with installing physical guards in the rotary table area of drilling and service rigs under some of the guarding provisions of the CSA Standard referenced in section 12.3. This guideline provides information on other measures to consider for safeguarding in the rotary table area, pursuant to the CSA Standard and the employer's obligation to conduct a risk analysis and adopt safe work procedures as required under section 23.5 of the *Regulation*.

The CSA Standard and safeguards at the rotary table area
Machines, including drilling rigs, are required to comply with the safeguarding requirements of section 12.3 of the *Regulation*. Generally, the first choice for safeguarding a hazard is a physical barrier, but it is recognized that it is not usually possible to completely guard rotary tables in that manner.

The definition of a safeguard in the *Regulation* includes awareness barriers, warning signs and other appropriate means. In addition, the CSA Standard recognizes that physical barriers are not practicable in all situations. For example, section 4.2.2.7 of *CSA Standard Z432-94* states:

> It is necessary to inform and warn the users about residual hazards against which risk reduction by design and safeguarding techniques are not, or not totally, effective. The instructions and warnings shall describe the procedures and operating modes intended to overcome those hazards; indicate if a particular type of training is required; and, if it is necessary, specify personal protective equipment.

The following measures are provided as procedures and methods to overcome and safeguard against hazards in the area of the rotary table. They are in addition to the requirements of section 23.61 and other applicable provisions of the *Regulation*. For convenience, the mandatory requirements of section 23.61 are noted at locations where related issues are addressed in the list of measures for safeguarding.

Measures for safeguarding in the rotary table area

1. All drilling and service rigs will clearly establish the rotary table area as a *Danger Zone*, which will include as much of the area around the

rotary table as is practicable, according to the style and layout of each individual rig.
2. The *Danger Zone* will be clearly identified to personnel by signs, visible markings or other similar means in a manner that reinforces the location of the *Danger Zone*.
3. Personnel are permitted in the *Danger Zone* only during non-drilling operations and only after a hazard assessment has been conducted and communicated to all personnel.
4. Entry into the *Danger Zone* will be limited only to workers and other personnel essential to the operations.
5. All personnel will be clear of the *Danger Zone* while the rotary table is engaged and the driller's controls are unattended. In addition, during drilling operations, personnel will not enter the elevated section of the rotary table *Danger Zone* (area covered by safety matting) while the table is in motion.

   Also note that sections 23.61 (1) & (3) of the *Regulation* state: (1) If visibility on the rig floor is obscured, workers must not work there while the rotary table is in motion. (3) The rotary table must not be engaged until all workers are clear of the rotary table.

6. When there are personnel within the *Danger Zone*, the rotary table will be restricted to a slow rate of speed and will be under the continuous direction of a designated driller positioned at the control console.
7. There will be no equipment, hoses, tools, cables or other items that could potentially become entangled within the *Danger Zone* while the rotary table is engaged and the driller's controls are unattended. This may include steam hoses, water hoses, wash guns, air hoses and other such equipment.

   Also note that section 23.61(2) of the *Regulation* states: Hoses, lines or chains must not be operated or handled near a rotary table while it is in motion.

8. Proper procedures will be followed for the donning, wearing, removing and storing of fall protection and related equipment. Procedures will include:
   - All harnesses and fall protection/arrest equipment will be donned and removed in a safe area away from the drilling floor. The Doghouse is recommended as such an area.
   - All lanyards, slings, carabineers and any other fall protection/arrest equipment used for work in the derrick will be stored in the Doghouse or another safe location. This equipment will not be carried or worn around the rig when no longer required for work operations.
   - No personnel may enter any designated *Danger Zone* while wearing a derrick harness or any additional fall protection or fall arrest equipment.
   - Workers' clothing or personal protective equipment (PPE) will be maintained in good working condition and worn so that it does not increase the risk of entanglement on or around any rotating equipment. Any loose, torn, damaged or otherwise hazardous PPE is prohibited in the *Danger Zone* and will be replaced.
9. Prior to working in the area of the rotary table, personnel will be instructed in and understand the *Danger Zone* hazards and safe work procedures at the particular site.

G23.64.1 Snubbing operations

Issued January 1, 2009; Editorial Revision November 21, 2017

Regulatory excerpt
Section 23.64.1 of the *OHS Regulation* ("*Regulation*") states:

> A snubbing operation must be carried out in accordance with recognized industry safe work practices.

Purpose of guideline
This guideline describes snubbing operations, and describes one source of recognized industry safe work practices.

What is snubbing?
During the operating life of an oil or gas well, it is occasionally necessary to "rework" the well to enhance, maintain, or continue the production of hydrocarbons. This process frequently requires the removal and cleaning, or replacement, of tubing (piping) or other apparatus in the well bore.

Where practicable, the well will be "temporarily killed" by filling the well bore with high density fluids, doing the necessary reworking, and then removing the high density fluids and bringing the well back into production. However, sometimes the conditions in the well and reservoir do not allow the temporary killing of the well as the high density fluids may damage the hydrocarbon-bearing formation and render the well no longer productive. Snubbing is the petroleum industry operation to control well pressure and the movement of jointed tubulars (pipes) and tools in or out of a well bore using snubbing equipment. Snubbing allows the reworking of a "live well," and may even involve the continued production of hydrocarbon from the well during the reworking process.

Snubbing is being done more frequently in B.C.'s oil and gas production sector. It is a specialized operation due to the potential for the release of hydrocarbons, which means a potential for a fire or explosion, or exposure to an atmosphere which is oxygen deficient or contains toxic gases (such as hydrogen sulfide) making the atmosphere immediately dangerous to life and health.

Recognized industry safe work practices
The intent of *Regulation* section 23.64.1 is to ensure that proper guidance is available and practiced for snubbing operations, in the form of recognized safe work practices.

One source of recognized industry safe work practices is Energy Safety Canada's DACC (Drilling and Completions Committee) Industry Recommended Best Practice *(IRP) Volume #15 — Snubbing Operations (2015)*. It has been developed by the oil and gas industry in western Canada for snubbing operations.

G23.69 Flow piping systems - Integrity assurance program

Issued 1999; Revised December 19, 2013; Editorial Revision August 28, 2015; Formerly issued as G23.69 Flow piping - Revised consequential to August 1, 2017 Regulatory Amendment

Regulatory excerpt
Section 23.69 of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must develop and implement a program for the purpose of ensuring the integrity of the flow piping systems at the worksite.
>
> (2) In fulfilling the requirements of subsection (1), the employer must consider the conditions under which each flow piping system may operate, including corrosion factors and fluctuating temperatures and pressures, and the program must include provision for the following elements:
>
> (a) routine inspections, non-destructive testing and pressure testing of piping and other component parts of each flow piping system, including setting out in writing, for each type of part to be inspected and tested,
>
> (i) the inspection and testing procedures,
>
> (ii) the frequency of inspection and testing and how the frequency is to be determined,
>
> (iii) the criteria for rejection of a type of part and its removal from service, and
>
> (iv) the method of determining how frequently a type of part is to be replaced, including the basis for replacement;
>
> (b) preparing, updating and making readily available at the worksite an up-to-date document, relating to the inspections and testing referred to in paragraph (a), that identifies each part that has been inspected and tested, and sets out, for that part,
>
> (i) the inspection and testing procedures followed,
>
> (ii) the results of the inspection and testing, and
>
> (iii) if a part has been rejected, the rejection criteria applied;
>
> (c) periodic reviews and updates of the program;
>
> (d) a system of preparing and retaining records in relation to each element of the program.
>
> (3) The employer must assign to a qualified person responsibility for administration of the program referred to in subsection (1).

Purpose of guideline
The purpose of this guideline is to provide information on the integrity assurance program for flow piping systems and to provide guidance on routine inspections and testing of flow piping and component parts.

Integrity assurance program
Section 23.69 states that the employer must develop and implement an integrity assurance program for its flow piping systems - commonly known in the oil and gas industry as an Operations and Maintenance Program ("O&M Program").

The purpose of the integrity assurance program is to ensure that flow piping systems remain safe for workers during their anticipated operation. In developing the program, the employer must consider the conditions under which the flow piping systems are operated, such as corrosive conditions and fluctuating temperatures and pressures that may deteriorate the piping and associated component parts with use.

Employers' flow piping systems could encounter a wide range of operational conditions depending on the well operation and services performed. The integrity assurance program needs to reflect the specific operations of the employer and the level of complexity of the program would reflect this (i.e., operations that are complex and diverse in scope would have an integrity assurance program that is more detailed and sophisticated than a more straightforward operation, like a well control activity).

Qualified person

Section 23.69(3) states that the employer must assign a qualified person responsibility for the administration of the integrity assurance program. The qualified person is a person who has oversight of the program to ensure the elements of the program are being carried out in accordance with regulatory requirement. This person understands the elements of the program and would be capable of monitoring the effectiveness of the program. For some employers, it may be an engineer who would be overseeing the inspection and tests being conducted on the piping and other component parts.

Inspection and testing frequency

One of the key requirements in section 23.69 is to routinely inspect and test piping and component parts of each flow piping system to ensure its integrity throughout its service life.

The integrity assurance program would include a list of component parts to be inspected and tested by non-destructive testing and pressure testing methods. Examples of non-destructive testing methods include, but are not limited to, magnetic particle inspection, ultrasonic thickness inspection, and internal visual inspections of piping and component parts. It is the employer's responsibility to determine the method of non-destructive testing to use and to perform these tests in accordance with industry accepted procedures, such as the *ASME Standard B31.3-1993*, as referred to in section 23.12. Employers are also responsible for determining the frequency of these tests, the criteria for rejection, and the basis of replacement, as per section 23.69(2). Pressure testing requirements are outlined in section 23.72 of the Regulation.

The inspection and testing process must define, for each item, what needs to be inspected and tested, the frequency of inspection and testing, how this frequency was determined, the inspection and testing procedures, rejection criteria, and how the frequency of replacement of component parts is determined; including the basis for determining replacement. The results of the inspection and testing must be documented. All of these elements are documented and updated as necessary. It is acceptable for the employer to have the inspection and testing documents in an electronic format that is readily accessible at the worksite in fulfilling the requirements of section 23.69(2)(b) to have up-to-date documents at the worksite.

Well testing and stimulation work can expose piping and parts to harsh conditions that are corrosive and abrasive. The frequency of inspections and testing required in an integrity assurance program will depend on the nature and frequency of the work. The employer needs to base the frequency of the testing and inspection on ongoing monitoring of the conditions in which the piping and its component parts are exposed, rather than relying upon set intervals of inspection and testing.

Determination of the necessary inspection and testing frequency must include consideration of the severity of service and fluctuating pressures and temperatures. For example, severe service would include flowback of acids; solvents; substances with large amounts of chloride, $C0_2$, or H_2S; fracturing sand; or other well debris. As the service severity increases, the frequency of testing and inspection needs to increase. The integrity assurance program needs to respond to these types of changes in the dynamic nature of well stimulation operations to ensure that these flow piping systems do not fail in a catastrophic manner.

G23.69(3) Restraint of piping systems

Issued August 28, 2015; Retired and replaced by G23.69.2(3) Engineered restraint systems â€“ Engineering documentation, consequential to August 1, 2017 regulatory amendment

G23.69.2(3) Engineered restraint systems â€“ Engineering documentation

Issued consequential to August 1, 2017 regulatory amendment

Regulatory excerpt
Sections 23.69.2(1), (2), and (3) of the OHS Regulation ("Regulation") state:

> (1) The employer must ensure that each flow piping system at the worksite is restrained by an engineered restraint system that is designed and manufactured
>
> (a) to be used for the purpose of safely restraining the flow piping system, and
>
> (b) to withstand the forces that may be encountered if the flow piping system fails.
>
> (2) If a restraint system has been manufactured by a commercial manufacturer, the employer must ensure that the restraint system is installed and anchored in accordance with the instructions and specifications of that manufacturer.
>
> (3) If a restraint system has been manufactured by the employer or another person who is not a commercial manufacturer, the employer must ensure that
>
> (a) engineering documentation, including technical specifications and instructions for use, has been prepared and signed by the person responsible for demonstrating that the restraint system has been designed and manufactured as described in subsection (1),
>
> (b) the restraint system is installed and anchored in accordance with that engineering documentation, and
>
> (c) a copy of that engineering documentation is readily available at the worksite.

Purpose of guideline
The purpose of this guideline is to provide information on the engineering documentation referred to in section 23.69.2(3) for a restraint system that has been manufactured by the employer or another person who is not a commercial manufacturer.

Engineering documentation
Employers must ensure that each flow piping system is restrained by an engineered restraint system. Section 23.69.2(3) permits employers to use a restraint system that was not commercially manufactured; however, engineering documentation must be prepared for that restraint system.

Restraint systems that use components that are not specifically designed by the manufacturer for the purpose of flow piping restraint can be used for the purpose of restraining flow piping with detailed engineering documentation, including technical specifications and instructions for use.

Examples of technical specifications and instructions in the engineering documentation include the following:

- Instructions on installation and use of the restraint system
- Engineering specifications and drawings of the restraint system, including the attachment points and anchor requirements, and details about specific anchor points that are designed and adequate for the purpose of restraining the flow piping system
- Precautionary information and limitations, such as the maximum pressure in the system and worker exclusion zones
- Testing certification of components (e.g., of the slings and anchors)
- Other instructions for component use, maintenance, inspection, and removal from service

The engineering documentation must be prepared and signed by the person responsible for demonstrating that the restraint system has been designed and manufactured to be used for the purpose of safely restraining the flow piping system and it is able to withstand the forces that may be encountered if the flow piping system fails. Certification by a professional engineer that the restraint system has met the conditions outlined in section 23.69.2(1) would meet the intent of this regulatory requirement.

Similarly, employers using restraint systems made by a commercial manufacturer would typically have the manufacturer's instructions and specification on-site for reference, including instructions for what workers need to know for proper installation and anchoring.

G23.80 Venting of trucks

Issued 1999; Editorial Revision February 25, 2013

Regulatory excerpt
Section 23.80 of the *OHS Regulation* ("*Regulation*") states:

> Tank trucks or loading facilities must have a system for protecting workers from hydrogen sulfide if it is present.

Purpose of guideline
This guideline gives examples of acceptable systems for protecting workers from hydrogen sulfide.

Systems for protecting workers
The following systems may be used for protecting workers from hydrogen sulfide at tank trucks or loading facilities:

- Pressurized tank trucks
- Atmospheric tanks with a suitable vapour gathering system
- Scrubber system, truck-mounted or fixed
- An enclosed system

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G23.88 Alternate acceptable standard

Issued October 20, 2020

Regulatory excerpt
Section 23.88(1) of the *OHS Regulation ("Regulation")* states:

> (1) Gas sample containers must meet the requirements of *CSA Standard CAN/CSA-B339-88 Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods*.

Section 4.4(2) of the *Regulation* states:

> (2) When this Regulation requires a person to comply with
>
> (a) a publication, code or standard of the Board or another agency, the person may, as an alternative, comply with another publication, code or standard acceptable to the Board …

Purpose of guideline
Section 4.4(2)(a) of the *Regulation* provides WorkSafeBC the authority to accept alternative standards to those listed in the *Regulation*. The purpose of this guideline is to specify the 2018 version of the CSA Standard CAN/CSA-B339-88 as an acceptable alternative standard under section 23.88(1).

Alternative standard
The CSA Standard *CAN/CSA-B339-18 Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods* is accepted as an alternate standard.