G21.73 Misfires

Issued August 1999; Retired consequential to June 3, 2019 Regulatory Amendment

G21.56 Safety fuse assemblies

Issued August 1999; Editorial Revision July 23, 2014

Regulatory excerpt
Section 21.56 of the *OHS Regulation* ("*Regulation*") states in part:

> (1) Only safety fuse assemblies with antistatic protection may be used for safety fuse blasting.
>
> (2) Safety fuse assemblies less than 1 m (3.3 ft) in length must not be used.

Section 21.57(2) of the *Regulation* states:

> (2) When multiple safety fuses are to be lit, a suitable safety fuse lighting device must be used to ensure that a minimum 90 cm (3 ft) fuse length safety factor is maintained.

Purpose of guideline
The purpose of this guideline is to clarify anti-static protection and safety fuse length.

Anti-static protection
Anti-static protection means that only safety fuse assemblies with a static shunt can be used. Bulk fuse and hand crimping of assemblies do not allow for anti-static protection and are prohibited.

Safety fuse assembly length
The *Regulation* states that "safety fuse assemblies less than 1 m (3.3 ft) in length must not be used." A safety fuse from a manufacturer is 1 metre or 3 feet 3 inches long. As provided by section 21.57(2) of the *Regulation*, this fuse length may be trimmed to expose fresh powder or to remove the igniter cord connector. The minimum trimmed length cannot be less than 90 cm or 3 feet.

G21.57 Lighting safety fuse

Issued August 1999; Retired July 23, 2014

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G21.82 Underwater blasting

Issued March 31, 2015

Regulatory excerpt
Section 21.5(3) of the *OHS Regulation* ("*Regulation*") states:

> (3) A blaster may be assisted by persons who do not hold blaster's certificates, but the blaster must have authority over the assistants and must exercise visual supervision over them and be responsible for their work during explosive loading, priming, fixing or firing.

Section 21.82 of the *Regulation* states:

> (1) Only explosives and blasting accessories recommended by the manufacturer for underwater blasting may be used for underwater blasting.
>
> (2) Whenever explosive materials are being used in underwater blasting operations, a blasting flag (international code "Bravo", a solid red flag) must be displayed.
>
> (3) Precautions must be taken to prevent damage to structures in the danger area.
>
> (4) Underwater blasts must not be detonated when a diving operation or water craft is within the danger area, nor until the diving supervisor has given permission for the blaster to fire the charge.
>
> (5) After detonating an underwater blast, the site must be examined by the blaster, or by a competent diver who
>
> (a) has been instructed in the recognition of undetonated explosive materials and other blasting related hazards, and
>
> (b) is under the direction of a blaster.
>
> (6) The blaster must ensure that misfires are handled properly and that other blasting related hazards are removed.

Purpose of guideline
The purpose of this guideline is to provide clarification of the duties of the certified blaster of record and the diver working under the direct supervision of that blaster, when the diver is not a certified blaster.

Underwater blasting
If the diver is not a certified blaster he/she may be visually supervised by a certified blaster on the surface as per section 21.5(3) of the *Regulation*. This may be accomplished by the use of the diver's helmet camera or with a camera from an ROV (remotely operated underwater vehicle) prepositioned to observe the diver. If an ROV is utilized it must be ensured that the explosives and initiation train do not come into contact with the ROV propellers.

The blaster may direct an unrestricted surface supply diver in placement, post blast examination, and in dealing with misfires for an underwater blast site. Refer to sections 24.37(1) and 24.1 of the *Regulation* for definitions of "*construction diving*." The diver must be trained in the use of explosives. Refer to section 24.13(1)(a) of the *Regulation*, "Evidence of competency."

G21.83 Special effects blasting

Issued August 1999; Editorial Revision June 15, 2012; Editorial Revision September 19, 2014; Editorial Revision February 14, 2020

Regulatory excerpt
Section 21.83 of the *OHS Regulation* ("*Regulation*") states:

> Special effects blasting must be carried out under the direction of a blaster certified in this specialty to a standard acceptable to the Board.

Purpose of guideline
The purpose of this guideline is to identify a standard acceptable to WorkSafeBC for special effects blasting and to outline the procedures for WorkSafeBC prevention officers investigating a complaint or incident involving pyrotechnic blasting in the film or performing arts industry.

Acceptable certification
For the purpose of this section, WorkSafeBC accepts the Pyrotechnic Blaster's certificate issued by the Natural Resources Canada/Explosive Regulatory Division (NRC/ERD).

Refer to Guideline G21.5(1)-2 Authority to blast - Certificates acceptable to WorkSafeBC for more information regarding a Memorandum of Understanding between the NRC/ERD and WorkSafeBC.

Investigation procedures

Addendum 1 of the Memorandum of Understanding between the NRC/ERD and WorkSafeBC outlines the procedures for prevention officers investigating incidents, accidents, and dangerous or unusual occurrences involving pyrotechnic blasting in the film and performing arts industries. The Addendum reads as follows:

ADDENDUM 1

WorkSafeBC Officers' Procedures for Incidents, Accidents, and Dangerous or Unusual Occurrences Involving Pyrotechnics in Film and Performing Arts

If you observe or respond to a complaint of an injury, incident, or dangerous or unusual occurrence:

1. Have the blaster/pyrotechnician in charge temporarily stop all explosive pyrotechnic work at the work site.

2. Conduct an onsite preliminary investigation into the cause of the injury, incident or occurrence. Assess any unsafe act that may have contributed to the problem. Assess all hazards presented to workers, the public, and property. Consider issuing a closure under current policies, if deemed necessary.

3. Contact the NRC/ERD and liaise with the Explosives Inspector regarding preliminary investigation details. The blaster may not conduct any further explosive/pyrotechnic work until a decision has been made jointly by WorkSafeBC and the NRC/ERD. The decision will be reached within seven days.

WorkSafeBC cannot revoke or suspend the certificate. Pending a complete investigation, the Explosives Inspector may suspend or revoke a certificate, if warranted. The WorkSafeBC officer will make recommendations on the suspension or revocation of a certificate when serious unsafe acts or infractions are evident or suspected.

4. Produce an investigation report and forward copies to WorkSafeBC Certification Services and the Explosives Inspector.

NRC/ERD contact number within B.C. is 604-666-0366

G21.85(1)-1 WorkSafeBC acceptance of procedures for avalanche control

Issued August 1999; Revised November 18, 2009; Revised June 10, 2010; Editorial Revision March 7, 2011

Regulatory excerpt
Section 21.85 of the *OHS Regulation* ("*Regulation*") states, in part:

> (1) Explosive charges must not be placed manually on site by workers or projected by any means for the purpose of avalanche control, until the proposed work procedures have been submitted to and accepted by the Board.
>
> (4) The employer must ensure that procedures are reviewed annually and that proposed changes to the procedures are submitted to the Board for approval before implementation.

Purpose of guideline
The purpose of this guideline is to describe the process for submitting proposed avalanche control work procedures to WorkSafeBC for acceptance.

Process for submitting proposed work procedures
Prior to any avalanche blasting, a comprehensive set of procedures must be submitted to the Certification Services department of WorkSafeBC for acceptance.

The procedures should require, among other things, annual refresher training and a minimum level of experience for workers employed in avalanche control. No blasting activity is permitted until WorkSafeBC grants written acceptance of the work procedures.

As required by section 21.85(4) of the *Regulation*, the employer must review the procedures annually and any proposed changes must be submitted to WorkSafeBC for approval before implementation. Once the initial plan has been approved by WorkSafeBC, it only needs to be resubmitted for acceptance if there is a change.

Please consult the Guide for Writing Avalanche Control Blasting Procedures prepared by the Certification Services Department of WorkSafeBC.

For further information, please contact Certification Services (Tel: 604-276-3090 or 1-888-621-7233, local 3090) or see the Blaster Certification page on worksafebc.com.

G21.85(1)-2 Assessment of avalauncher device safety in proposed work procedures

Issued September 24, 2008; Editorial Revision November 21, 2017

Regulatory excerpt
Section 21.85(1) of the *OHS Regulation* ("*Regulation*") states:

> Explosive charges must not be placed manually on site by workers or projected by any means for the purpose of avalanche control, until the proposed work procedures have been submitted to and accepted by the Board.

Section 4.3 of the *Regulation* states:

> (1) The employer must ensure that each tool, machine and piece of equipment in the workplace is
>
> (a) capable of safely performing the functions for which it is used, and
>
> (b) selected, used and operated in accordance with
>
> (i) the manufacturer's instructions, if available,
>
> (ii) safe work practices, and
>
> (iii) the requirements of this Regulation.
>
> (2) Unless otherwise specified by this Regulation, the installation, inspection, testing, repair and maintenance of a tool, machine or piece of equipment must be carried out
>
> (a) in accordance with the manufacturer's instructions and any standard the tool, machine or piece of equipment is required to meet, or
>
> (b) as specified by a professional engineer.
>
> (3) A tool, machine or piece of equipment determined to be unsafe for use must be identified in a manner which will ensure it is not inadvertently returned to service until it is made safe for use.
>
> (4) Unless otherwise specified by this Regulation, any modification of a tool, machine or piece of equipment must be carried out in accordance with
>
> (a) the manufacturer's instructions, if available,

(b) safe work practices, and

(c) the requirements of this Regulation.

Section 120 of Part 3 (Occupational Health and Safety) of the *Workers Compensation Act* (*Act*) provides:

Every supplier must

(a) ensure that any tool, equipment, machine or device, or any biological, chemical or physical agent, supplied by the supplier is safe when used in accordance with the directions provided by the supplier and complies with this Part and the regulations,

(b) provide directions respecting the safe use of any tool, equipment, machine or device, or any biological, chemical or physical agent, that is obtained from the supplier to be used at a workplace by workers,

(c) ensure that any biological, chemical or physical agent supplied by the supplier is labelled in accordance with the applicable federal and provincial enactments,

(d) if the supplier has responsibility under a leasing agreement to maintain any tool, equipment, machine, device or other thing, maintain it in safe condition and in compliance with this Part, the regulations and any applicable orders, and

(e) comply with this Part, the regulations and any applicable orders.

Purpose of guideline
The purpose of this guideline is to provide information on some of the criteria that are considered when assessing the adequacy of avalanche control work procedures, particularly as they relate to the safety of Avalaunchers and similar devices ("Avalauncher Devices").

Background
Avalauncher Devices use compressed gas to launch purpose-built explosive projectiles into areas where potential avalanches exist, as a planned measure to mitigate the hazard. Section 21.85(1) of the *Regulation* provides that before explosive charges are placed manually on site by workers or projected by any means for the purpose of avalanche control, the proposed work procedures must be submitted to and accepted by WorkSafeBC.

Device design and fabrication
The proposed work procedures should include assurances that the Avalauncher Device has been designed and manufactured in accordance with good engineering practice, with due consideration to its purpose, mechanism of operation, operating conditions, and the environment for which it is intended.

The design and fabrication of the Avalauncher Device should be certified by a professional engineer to provide assurance that the device will function safely when operated and maintained as specified by the manufacturer. Where the safety of the device may only be guaranteed within limited operating conditions, such as within specific temperature and/or pressure ranges, those operating conditions should be clearly indicated on the design documents by the professional engineer.

All welded connections that are not a part of a pressure vessel or fitting should meet the requirements of *Canadian Standards Association* ("*CSA*") *Standard W59-03 Welded Steel Construction (Metal Arc Welding)* or *CSA Standard W59.2-M1991 (R1998) Welded Aluminum Construction*, as applicable. (Note: For a copy of any CSA standard, contact CSA at 604-244-6652, or your local library.)

The Avalauncher Device's compressed gas piping system should include the following features:

(a) One or more pressure relief valves set at or below the maximum allowable system pressure

(b) A regulator at the supply tank that reduces the pressure at the tank to the system operating pressure

(c) Gauges to display the pressure at all points for which the operator must be aware of the pressure

(d) A safety valve located so as to require that both the safety and fire valves be open before firing is allowed

(e) Fire and safety valves that require opposing rotation motions to open

(f) Be equipped to allow remote firing

The Avalauncher Device's elevation mechanism should have a means of positively locking it in a fixed position for firing.

Each control valve on the Avalauncher Device should be labelled to identify its function.

BC Safety Authority (operating as Technical Safety BC — "TSBC") requirements
Avalauncher Devices are subject to the requirements of the *Safety Standards Act* and its regulations, including the *Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation* ("*Pressure Vessel Regulation*"). The *Pressure Vessel Regulation* adopts *CSA Standard B51-03 Boiler, Pressure Vessel, and Pressure Piping Code* ("*CSA B51-03*"), which prescribes requirements that must be met by Avalauncher Devices, including the registration of its components with the TSBC.

The *Safety Standards Act* and its regulations, including the *Pressure Vessel Regulation*, also govern pressure welding. A pressure welder's certificate of qualification issued by TSBC is required before conducting any work regulated under the *Pressure Vessel Regulation*. Any welded connections affecting the registration of the pressure vessel or fitting must meet the requirements of *CSA B51-03* and must be approved by TSBC.

CSA B51-03 requires fittings to be stamped with the Canadian Registration Number ("CRN") or Canadian Central Registration Number ("CCRN") and identification traceable to the manufacturer. Each Avalauncher Device should be fitted with a nameplate that permanently and legibly displays the following:

- Make/Model
- Manufacturer name and address
- Serial number
- Date of manufacture
- Maximum allowable operating pressure

CSA B51-03 also requires pressure vessels to be marked with the CRN or CCRN, and as required by the applicable American Society of Mechanical Engineers code.

Manufacturer's manuals
The following instruction and information manuals should be provided for each Avalauncher Device:

- Operations Manual including
  - Specifications
  - Pre-use inspections
  - Operating procedures
  - Preventive maintenance
  - Storing the Avalauncher Device when not in use
- Parts Manual including
  - Assembly/exploded view drawings identifying all parts
  - Listing of all parts and part numbers or identification of off-the-shelf parts to allow purchase of proper replacement parts
- Service Manual including
  - System specifications
  - Inspection and maintenance instructions
  - Pneumatic circuit diagram
  - Troubleshooting information

Inspection and maintenance records
It is good practice to maintain proper records of all inspection and maintenance conducted on the Avalauncher Devices. In particular, records should be kept of the following:

- Pre-use inspections
- Periodic inspections, maintenance, and tests
- Special inspections, maintenance, and tests

Questions
Questions regarding this guideline may be directed to the Certification Services department of WorkSafeBC.

G21.85(3) Safety fuse ignition system

Issued August 1999; Revised November 18, 2009

Regulatory excerpt
Section 21.85(3) of the *OHS Regulation* ("*Regulation*") states

> The pull-wire lighter must not be placed on the safety fuse assembly until immediately before placing the charge.

Section 21.36 of the *Regulation* states:

> Explosive materials must be stored, transported, handled and used in the manner recommended by the manufacturer.

Purpose of guideline
The purpose of this guideline is to clarify the sequence of events for deploying a charge utilizing a safety fuse assembly as a timing device for the purpose of avalanche control.

Procedure for charge deployment
A "pull-wire lighter" is a device that fits over the open end of the safety fuse assembly. The igniter cord connector, if fitted, will have to be cut off in order to have an open, clean end in the fuse assembly. In the case of a protective cap, ½ inch of the fuse end will have to be cut off. If the manufacturer has provided different instructions on how to use the safety fuse assembly, these must be followed as required by section 21.36 of the *Regulation*.

Only fuse cutters recommended by the safety fuse manufacturer (for example, guillotine delrin base) should be used for cutting. The cut should be clean and square prior to placing the fuse into the pull-wire lighter. The minimum required fuse length is 3 feet, or 90 cm, after cutting (section 21.57(2) of the *Regulation*).

The pull-wire lighter works by pulling on a "handle," which causes a "waved" wire to be pulled through a sensitive ignition compound, such as a chlorate match head mix. The resulting friction ignites the compound, and the fire lights the exposed end of the black powder core of the safety fuse assembly. Signs of ignition may include visible smoke, smell of smoke, fuse droop, or a discolored fuse. The blaster should determine if the fuse is lit or mislit prior to placing or deploying the charge.

Typically, one or more charges are lit and deployed one at a time into an avalanche path prior to personnel reaching a point of safety. The blaster will need to ensure that there is sufficient fuse length (burn time) to enable personnel to reach a point of safety before detonation of the first deployed charge occurs.

If the blaster is not able to verify that the fuse is lit, the fuse will be assumed to be lit and the blaster will continue with charge deployment as per the manufacturer's instructions.

If the pull wire fails to light, the fuse must not be cut and relit. Section 21.79 of the *Regulation* prohibits the relighting of a safety fuse.

G21.8 Certification – Qualifications

Issued August 1999; Revised October 2005; Revised September 30, 2009; Editorial Revision June 15, 2012; Revised December 16, 2016

Regulatory excerpt
Section 21.8 of the *OHS Regulation* ("*Regulation*") states:

> A candidate for a blaster's certificate must
>
> (a) be at least 18 years of age,
>
> (b) demonstrate a satisfactory knowledge of the English language, both written and spoken,
>
> (c) be physically capable of safely carrying out the duties of a blaster, and
>
> (d) forward written proof acceptable to the examining officer that
>
> (i) the candidate has had at least 6 months experience in blasting operations as an assistant to a blaster, and/or
>
> (ii) the candidate's character, knowledge, qualifications and experience would make the candidate competent to handle explosives.

Purpose of guideline
The purpose of this guideline is to outline proof acceptable under section 21.8(d) of the *Regulation.*

Proof of character
A candidate must confirm that he/she possesses an Explosives Regulatory Division approval letter (or equivalent) when registering for a blasting exam and present it to the blasting examiner prior to writing the exam. A NEXUS card, FAST card, Permis General, or Firearms Possession and Acquisition Licence (PAL) are considered equivalent.

Proof of knowledge, qualifications, and experience
Written proof as required by section 21.8(d) must include a description of

- Training provided to the candidate
- Type of blasting methods a candidate has observed and participated in
- Type of explosives used
- Locations of blasting experience
- Name(s) of certified blaster(s) overseeing the training, including certificate numbers
- Length of time (including dates) the candidate worked with the certified blaster(s)

The written proof must clearly indicate the candidate has at least six months practical experience in a blasting operation, or as an assistant to a blaster, and is competent and knowledgeable in the handling and use of explosive materials.

The sources of written proof under section 21.8(d) that may be acceptable, in descending order of preference, are the following:

(a) A signed letter or statement including a description of the information provided as proof as listed above attesting to the candidate's experience, knowledge, and qualifications from the following:

(i) the candidate's employer or former employer; or

(ii) a person holding a valid WorkSafeBC blaster's certificate with whom the candidate has worked, or

(b) A statutory declaration signed in the presence of a person authorized to administer an oath, containing a description of the information provided as proof as listed above

If the blasting candidate does not have the required experience in the area where the candidate wishes to be certified, the WorkSafeBC blasting certification manager of interest may accept alternative training programs and experience. The candidate should give details of these alternatives in the application. The training should cover both the theoretical and practical aspects. No blasting examination or certification will be permitted without prior approval by the WorkSafeBC blasting certification manager of interest.

Out-of-province blasters
Blasters who possess a trade qualification or other valid certificate as required by a regulatory authority in another province or territory in Canada do not need to undergo further testing or assessment. However, in order to receive a WorkSafeBC blaster's certificate, out-of-province blasters are required to apply to WorkSafeBC's Certification Services Department and complete a review of a "jurisprudence package" which outlines regulatory requirements and safe work practices applicable in B.C. Upon reviewing the package, the blaster will need to meet with a blasting examiner to confirm his/her understanding of the information and outline previous experience. The blaster will then be issued a WorkSafeBC certificate with an out-of-jurisdiction notation on it for his/her applicable type of blasting.

Certificate restrictions
A blaster's certificate will normally be issued for a period of five years, and may be endorsed with any restriction that WorkSafeBC deems necessary. Certificates may be restricted for a period that is less than five years. This may happen, for example, where the applicant has only the minimum of required experience (new blaster), his or her experience is from several years ago (break in certification), or the experience is in a different type of blasting from the certificate being examined for.

G21.10 Examinations

Issued August 1999; Revised October 2005; Withdrawn October 26, 2011

G21.12 Custody of certificates

Issued August 1999; Revised October 2005; Editorial Revision June 15, 2012; Revised May 9, 2014

Regulatory excerpt
Section 21.12 of the *OHS Regulation* ("*Regulation*") states:

> (1) A blaster must retain his or her certificate and must keep it in a safe place at the worksite while carrying out the duties of a blaster.
>
> (2) The blaster's certificate must be produced for inspection on the request of an officer.
>
> (3) A copy of a blaster's certificate is not acceptable as proof of certification.

Purpose of guideline
The purpose of this guideline is to describe WorkSafeBC's procedures for issuing replacement certificates and extended certificates for blasters. It also provides guidance in the situation where the certificate is lost or damaged and the blaster has not yet replaced it.

Issue of replacement certificates
A certified blaster who has lost or damaged his or her blasting certificate may request a replacement certificate for a fee prescribed by the Blasting Examiners Protocols and the WorkSafeBC Blaster certification website.

The replacement certificate will expire on the same date the original certificate would have expired. A provisional certificate may be issued by a certification officer to bridge the time required for the replacement certificate to be issued and forwarded to the blaster.

Issue of extended certificates
A blasting certificate is only eligible for an extension if it has not yet expired. In order to grant an extension a certification officer will ensure the following:

- An examination is impracticable prior to the certificate's expiry date
- A check made of the blaster's permanent file to ensure there are no outstanding issues with the certificate as issued
- The blaster is registered for an examination within 60 days of the expiration date of the original certificate

A certification officer may issue a provisional certificate for a period not to exceed 60 days from the expiry date of the original certificate.

A provisional certificate will not be issued in the following circumstances:

- If the original certificate has expired
- If there is reason to believe that the holder would be incapable of safely performing the duties of a blaster

Unable to produce certificate upon request
Where the person who conducts or directs a blasting operation upon inspection does not possess a blaster's certificate because it is claimed to be damaged or lost, a WorkSafeBC prevention officer will verify the certification of that person (including certificate #, type and expiry date) with

Certification Services, WorkSafeBC.

If the person is certified, the prevention officer will issue an Inspection Report containing words to the following effect:

> "(Blaster's Name), who is certified (Certificate #_____) to conduct (type of) blasting until (expiry date) was not in possession of a blaster's certificate as required by section 21.12 of the *Regulation*. Within five days, submit a written request for a replacement certificate to Certification Services in the Richmond office of WorkSafeBC."

G21.15 Suspension of certificates

Issued August 1999; Revised October 2005; Revised October 22, 2010; Revised September 21, 2011; Revised March 24, 2014; Revised September 15, 2015; Editorial Revision November 21, 2017

Regulatory excerpt
Section 21.15 of the *OHS Regulation* ("*Regulation*") states:

> An officer may seize and forward to the Board a blaster's certificate if there is reason to believe that the safety of any person may be or has been endangered by the blaster.

Section 195 (Part 3) of the *Workers Compensation Act* ("*Act*") states:

> (1) If the Board has reasonable grounds for believing that a person who holds a certificate issued under this Part or the regulations has breached a term or condition of the certificate or has otherwise contravened a provision of this Part or the regulations, the Board may, by order,
>
> (a) cancel or suspend the certificate, or
>
> (b) place a condition on the use of that certificate that the Board considers is necessary in the circumstances.
>
> (2) An order under this section suspending a certificate must specify the length of time that the suspension is in effect or the condition that must be met before the suspension is no longer in effect.

Purpose of guideline
The purpose of this guideline is to outline some blasting practices that may endanger the safety of a person and are therefore grounds for seizing a blaster's certificate under section 195(1) of the *Act*. It also describes the process of seizing a certificate and the recourse of the blaster if the certificate is amended, restricted, suspended, or cancelled.

Blasting practices that may endanger the safety of a person The following are examples of practices that may endanger the safety of a person:

- Smoking while handling explosives. This includes a blaster smoking while handling explosives, or permitting others to do so
- Using less than three feet (900 millimetres) of safety fuse to fire any shot
- Introducing a drill steel, or any other metal object, into a loaded hole
- Withdrawing explosives (other than ammonium nitrate/fuel oil (AN/FO) or slurries which may be washed out) from a loaded hole
- Using anything other than an approved blasting machine or safety switch
- Failing to adequately guard a blast or to ensure the danger area was clear of workers and other persons
- Carrying blasting caps or explosives in clothing pockets, or permitting helpers or other workers to carry explosives in a similar manner
- Storing blasting caps in an explosives magazine - or with explosives at any time
- Transporting explosives with personnel, other than those assigned to assist in handling the explosives
- Firing multiple electrical blasts without testing the circuit or circuits by use of an instrument acceptable to WorkSafeBC
- Abandoning explosives
- Failing to check a blast site adequately after the blast to ensure that no misfired or unfired charges remain and that workers are protected from loose rock or other materials that pose a hazard
- Failure to use adequate cover or other effective means to control the blast and protect persons and/or property from flying material (refer to section 21.66 of the *Regulation*)
- The blaster conducting himself/herself in such a way that poses an unreasonable threat to the safety and well-being of other workers or the public
- Carrying out unsafe practices in contravention to manufacturer's recommendations and instructions (refer to section 4.3 and section 21.36 of the *Regulation* e.g., electrical blasting caps must be initiated in a manner recommended by the manufacturer)

Procedures for seizing certificates
WorkSafeBC prevention officers seizing a certificate under section 195(1) of the *Act* must issue an Order to Worker ("OtW") report citing section 195(1) of the *Act* and outlining the non-compliant action(s) of the blaster to support the seizure of the certificate. Further information is provided in OHS Guideline G-D3-116 (Appendix - Procedural Directions When Issuing an OtW).

When a prevention officer takes possession of a blaster's certificate for cause, the prevention officer should contact Certification Services and forward the following information, items, or materials to the manager of Certification Services within seven days:

- The certificate
- The detailed statement of the circumstances and the nature of the infraction (including witness statements, photos, and incident reports if available)
- The document number of the applicable OtW and any related inspection reports

Both the blaster and/or employer may also provide a written statement to the prevention officer, which the prevention officer will forward with the certificate.

Enform certificates, which are issued for seismic blasting and/or oil well perforating, are specific to the oil and gas industry (refer to OHS Guideline G21.5). The Enform certificate and the Enform attendance certificate must be seized together and forwarded to the manager of Certification Services within seven days according to the above procedure.

Note: As of October 2017 Enform has merged with the Oil Sands Safety Association (OSSA) to form Energy Safety Canada. At this time Enform certificates are still recognized as valid. Moving forward certificates will be re-branded as they expire and are renewed.

Amending, restricting, suspending, or cancelling a blasting certificate
The manager of Certification Services may become aware of additional reasons for amending, restricting, suspending, or cancelling a blasting certificate as a result of a seizure under section 195(1) of the *Act* or from other sources. The manager of Certification Services will ensure that an investigation of the circumstances is carried out. Based on the outcome of the investigation, the manager of Certification Services will determine whether to amend, restrict, suspend, or cancel the certificate. When WorkSafeBC is considering or has taken action in accordance with section 195 of the *Act*, the person affected will be provided with an opportunity to make representation to WorkSafeBC.

The manager of Certification Services will advise the blaster or affected person of the reason for any decision in writing. A person aggrieved has a right to a review of the decision within 45 days. A final decision made by a review officer regarding section 195 of the *Act* (orders to amend, restrict, suspend, or cancel a certificate) may be appealed to the Workers' Compensation Appeal Tribunal ("WCAT").

WorkSafeBC will not be responsible for costs or expenses incurred by the employer or blaster as a result of a suspension or investigation.

Note: Prevention officers must not seize certificates issued by the Explosives Regulatory Division of Natural Resources Canada. Refer to OHS Guideline 21.83 for information on the procedure for investigating incidents, accidents, and dangerous or unusual occurrences involving blasters certified by Explosives Regulatory Division of Natural Resources Canada.

G21.75 Unfired explosives

Issued August 1999; Editorial Revision September 19, 2014

Regulatory excerpt
Section 21.75 of the *OHS Regulation* ("*Regulation*") states:

> (1) If there is evidence or suspicion of misfired charges or undetonated explosives
>
> (a) all loose unfired explosives must be collected and destroyed in a safe manner, and
>
> (b) the blaster must direct the hand removal of as much broken material as possible before metallic tools or equipment are used.
>
> (2) Metallic equipment must not be used during misfire procedures unless
>
> (a) the blaster directs the use of the equipment,
>
> (b) the area is adequately illuminated, and
>
> (c) everyone, except the blaster and the equipment operator, is removed from the area.

Purpose of this guideline
This guideline is to describe procedures for misfired or undetonated explosives depending on specific circumstances.

Explosives with no detonator
Explosives that do not contain a detonator can be gathered in a suitable container and destroyed in a manner recommended by the manufacturer. Explosives that are damaged, deteriorated, or misfired, which need to be transported to a disposal site by a vehicle, require a prior authorization from the Chief Inspector of the Natural Resources Canada/Explosive Regulatory Division (NRC/ERD).

Primer or explosives with a detonator
If a "primer" or explosive with a detonator inserted is found, it should not be disturbed. It should be detonated where it is using a new primer that is placed in contact with the unexploded material. Refer to section 21.77(2) of the *Regulation*.

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G21.23 Transportation - Flammable materials

Issued August 1999; Editorial Revision June 26, 2014

Regulatory excerpt
Section 21.23 of the *OHS Regulation* ("*Regulation*") states:

> Reasonable quantities of flammable or combustible materials may be carried by a conveyance transporting explosives at the workplace provided such materials are contained in a manner which will not cause or transmit a fire or explosion, and are adequately separated from any explosives containers on the conveyance.

Purpose of guideline
The purpose of this guideline is to describe reasonable quantities of flammable or combustible materials that may be carried by a conveyance transporting explosives.

Reasonable quantities
Smaller operators frequently have a fuel tank mounted on the back of their trucks, as well as small amounts of oils for normal daily maintenance. The fuels or oils should be carried within approved containers. They should also be secured against movement and leakage. These criteria also apply to propane cylinders.

"Reasonable quantities" means an amount required for immediate use during a normal shift.

G21.25(b)(v) Mobile drilling rigs

Issued August 1999; Revised consequential to February 1, 2012 Regulatory Amendment

Regulatory excerpt
Section 21.25(b)(v) of the *OHS Regulation* ("*Regulation*") states:

> The transportation of explosives on a mobile drilling rig is only permitted if
>
> (b) the explosives and detonator containers are
>
> (v) attended by the blaster of record, or a qualified person designated by the blaster, at all times when explosives are being carried.

Purpose of guideline
The purpose of this guideline is to provide guidance in determining a qualified person.

Attendant for explosives and detonator containers
Section 21.25 of the *Regulation* allows explosives to be carried on mobile drillings rigs if certain listed conditions are met. One of these conditions, set out in clause (b)(v), is that the explosives and detonators are "attended by the blaster of record, or a qualified person designated by the blaster, at all times when explosives are being carried." This requirement is intended to ensure that the containers are secure at all times during transport.

If the person attending is not a certified blaster, that person must meet any applicable federal qualification requirements and should be at least 18 years of age. Further, as set out in section 21.2 of the *Regulation*, the employer must ensure that the person has been provided with adequate direction and instruction, and is competent to perform the assigned work.

G21.27 Contact with metal

Issued August 1999; Editorial Revision June 26, 2014

Regulatory excerpt
Section 21.27 of the *OHS Regulation* ("*Regulation*") states:

> Contact between packages containing explosives and exposed ferrous metal in a conveyance must be prevented by the use of wood, tarpaulin, or other suitable dunnage materials.

Purpose of guideline
The purpose of this guideline is to identify an acceptable alternate metal for transport containers.

Containers that are constructed out of steel pose the inherent risk of a spark within the compartment which contains explosives. Any compartment that contains explosives is required to be free of grit or abrasive material which may create a spark. Any materials used must not be spark or flame producing.

Transport Containers
Transport containers may be made of unlined aluminum, as long as there is no interior exposed ferrous metal. These aluminum containers may be lined with ¼" plywood as an extra precaution.

Compartments containing explosives of mixed compatibility such as boosters and detonators must be effectively separated to ensure that if the detonators were to initiate the explosive force would not be transferred to the other explosive compartments.

Effective means of separation may be achieved by six inches of solid or laminated wood or by a laminated barrier, consisting of steel or aluminum, sheetrock and plywood on either side of the metal barrier

Further requirements of transporting explosives can be found in sections 21.24, 21.25 and 21.32 of the *Regulation*.

G21.28 Emergency procedures

Issued August 1999; Revised June 26, 2014

Regulatory excerpt
Section 21.28 of the *OHS Regulation* ("*Regulation*") states:

> Before explosives are transported, the employer must establish suitable written emergency procedures, and must ensure that all workers who may be affected are adequately instructed in the procedures.

Purpose of guideline
The purpose of this guideline is to outline the requirements for suitable written emergency procedures, and to identify when Transport Canada (TC) regulations are also applicable.

Emergency procedures (75kg or greater)
The *Transportation of Dangerous Goods (TDG) Act* ("*Act*") and *Regulations* (Part 7 of the *Act* and sections 7.1 to 7.9 of the *Regulations*) require that vehicles carrying explosives of a net explosive quantity (NEQ) of 75kg or greater, or as required by schedule 1 to have an emergency response assistance plan approved by TC. The *Regulations* require the plan to have certain elements, including emergency contact numbers, a description of the emergency response capability, and how the plan can be activated. The plan must be referred to in the documents accompanying the load along with the telephone number to activate it and the TC reference number (refer to sections 4.4, 4.8 and 4.13 of the *TDG Regulations*). Details of the plan can be obtained from TC, Remedial Measures Specialist, at (604) 666-7955.

Transportation of Dangerous Goods Act: http://laws-lois.justice.gc.ca/eng/acts/T-19.01/
Transportation of Dangerous Goods Regulations: http://www.tc.gc.ca/eng/tdg/clear-tofc-211.htm

Emergency procedures (less than 75 kg)
For vehicles or conveyances transporting explosives less than 75kg NEQ the employer must have written emergency procedures that the workers must be familiar with and trained to implement. These procedures do not need to be registered with TC TDG section. However the procedures must contain the following:

- Means and details such as contact numbers or frequencies to activate the emergency procedure
- Description of the emergency procedures and response plan
- Details on the responsibilities and actions of the workers to contain or mitigate the incident
- Responsibility of reporting as required by section 21.3 of the *Regulation* and if applicable, the *TDG Act*.

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G21.42 Drilling - Predrilling requirements

Issued August 1999; Retired June 26, 2014

G21.62 Mobile transmitters

Issued August 1999; Editorial Revision June 15, 2012; Editorial Revision July 23, 2014; Retired consequential to June 3, 2019 Regulatory Amendment

G21.64 Initiating a blast in accordance with safe work practices

Issued August 1999; Editorial Revision April 2005; Retired July 23, 2014

G21.65 Firing from power lines

Issued August 1999; Editorial Revision July 23, 2014

Regulatory excerpt
Section 21.65 of the *OHS Regulation* ("*Regulation*") states:

> When firing is done from a power line, an approved blasting safety switch must be used, and the switch kept locked and inaccessible to anyone except the blaster."

Purpose of guideline
The purpose of this guideline is to identify the position of the switch when locked and criteria for an "approved blasting safety switch."

Switch
The switch is to be locked in the open position.

System
An "approved blasting safety switch" system should be designed by an electrical engineer for each work site location.

Power line blasting may only be conducted by a person experienced in and holding a valid blaster's certificate endorsed for this type of blasting.

G21.53 Connecting detonating cord

Issued August 1999; Editorial Revision July 23, 2014

Regulatory excerpt
Section 21.53 of the *OHS Regulation* ("*Regulation*") states:

> (1) When detonating cords are used, the cords must only be interconnected or attached to trunk cords at the last most practicable moment after all holes are loaded.
>
> (2) When detonating cords are used to prime a charge, the cord must be cut from the supply reel before, or as soon as possible after the charge is placed.
>
> (3) Detonators or detonator connectors must not be attached to a detonating line until everything is in readiness for the blast.

Purpose of guideline
The purpose of this guideline is to describe a detonator connector.

Detonator connector
A "detonator connector" is a device used to connect one explosive and another to provide a path for continuation of the explosion. It is also called a "detonating relay." Usually these devices have a timing or pyrotechnic delay device that will allow explosive charges to be detonated at certain timed intervals to allow for control of rock breakage, movement, and fly rock.

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G21.39 Handling explosives - Abandoned explosives

Issued August 1999; Editorial Revision June 15, 2012; Editorial Revision May 9, 2014

Regulatory excerpt
Section 21.39 of the *OHS Regulation* ("*Regulation*") states:

> Explosive materials and accessories must not be abandoned, but must be placed in suitable storage or disposed of in accordance with the manufacturer's instructions.

Purpose of guideline
The purpose of this guideline is to describe the overlapping legistation between WorkSafeBC (*Regulation*) and Natural Resources Canada (*Explosives Act*) regarding abandoned explosives

Explosives Act
If explosive products have been abandoned, the *Explosives Act* (Canada) is the applicable legislation. Section 20 of the Explosives Act states that "every person who abandons any explosive…is guilty of an offence…."

Section 27 of the *Explosives Act* states:
"Any explosive that appears to the Minister to be abandoned, to have deteriorated, or to be a danger to persons or property, may be seized and destroyed or otherwise disposed of by such person, in such manner and at such time and place as the Minister may direct."

The Explosives Disposal Unit (EDU) of the Royal Canadian Mounted Police (RCMP) is authorized to seize and dispose of any abandoned explosives.

When a WorkSafeBC prevention officer or other WorkSafeBC employee receives information regarding abandoned explosives, the information will be immediately forwarded to the nearest RCMP detachment. This information, as well as the name of the RCMP officer notified and the location of the detachment, is to be forwarded to Certification Services. The prevention officer will also consider issuing orders (under section 195(1) of the *Act*) and, where applicable, seizing the blasting certificate of the responsible person.

G21.16 Storage - Detonators

Issued August 1999; Revised June 26, 2014

Regulatory excerpt
Section 21.16 of the *OHS Regulation* ("*Regulation*") states:

> (1) Detonator products must not be kept in a store or receptacle in which explosives or safety fuses, fuse lighters, igniter cords or connectors are stored.
>
> (2) At the loading site, detonator products must be stored separately from other explosives, and in a crush resistant box which is clearly identified.

Purpose of guideline
The purpose of this guideline is to describe assemblies that are considered detonator products and require safe separation.

Detonator products
Safety fuse assemblies are products that have a detonator attached to a length of safety fuse which is crimped at the factory. They come in various lengths that are specific to a burn time; typically 1 to 3 meters in length. Nonel or shock tube assemblies have a detonator attached to the non-detonating plastic tube (which is the pathway of the energy to the detonator). These assemblies must be treated as "detonator products."

Electrical igniters which are used to initiate an explosive product or propellant (such as in wireline setting tools) are considered a detonator product for the purpose of safe separation, unless they are part of the packaged product shipped from the factory. In this case the product must be stored separately from all other explosives, detonator assemblies, and accessories.

G21.3 Dangerous incident reports

Issued August 1999; Editorial Revision July 2004; Revised May 9, 2014; Editorial Revision consequential to June 3, 2019 Regulatory Amendment

Regulatory excerpt
Section 21.3 of the *OHS Regulation* ("*Regulation*") states:

> (1) If a blasting accident occurs which causes personal injury, or if there is any other dangerous incident involving explosives, whether or not there is personal injury, the employer must
>
> (a) report the incident immediately to the Board, and
>
> (b) forward a written report of the incident to the Board without undue delay.
>
> (2) The written report of the incident must contain
>
> (a) the date, time and location of the incident,
>
> (b) the names and certificate numbers of all blasters involved,
>
> (c) the names and occupations of any persons injured,
>
> (d) the types of explosives, including detonators, and initiating device used,
>
> (d.1) the instrument used to test the electric blasting circuit,
>
> (e) a factual account of events including the blaster's log records,
>
> (f) the names of all employers responsible for workers present at the worksite when the incident occurred, and
>
> (g) the action taken by each employer referred to in paragraph (f).

Purpose of this guideline
The purpose of this guideline is to explain the requirement to report a blasting incident to WorkSafeBC.

Reporting
In addition to incidents causing personal injury, a "dangerous incident" may include problems with particular products, for example, repeated or suspicious misfires or premature detonations.

"Immediately" means the same as in G-D10-172-1. This reporting should occur as part of the employer's response at the time of the incident. For contact information refer to Reporting serious injuries and fatalities.

"Without undue delay" means that the written report must be submitted within three days of the incident unless the particular circumstances of the operation prevent this. The report must be submitted to the nearest WorkSafeBC office, which will forward a copy to Certification Services.

Information required
Section 21.3(2) of the *Regulation* lists the information that must be provided, including "a factual account of events including the blaster's log

records." This information should include the lot numbers of the product, if there is a perceived problem with the product being used, and photos if available.

Special effects blasting
Refer to OHS Guideline G21.83 for information on the procedure for investigating incidents, accidents, and dangerous or unusual occurrences involving blasters certified by the Explosives Regulatory Division of Natural Resources Canada.

G21.4 Blasting log

Issued August 1999; Revised May 9, 2014

Regulatory excerpt
Section 21.4 of the *OHS Regulation* ("*Regulation*") states:

> (1) The blaster of record must record in a log the preblast loading details and the results of the postblast site inspection.
>
> (2) Blasting logs must be maintained at the blasting site, available for inspection by an officer, workers and worker representatives.
>
> (3) The employer must ensure that blasting logs are kept for at least 5 years after completion of the blasting operation.
>
> (4) The blaster must maintain a personal log of all blasting work that the blaster has performed.

Purpose of guideline
The purpose of this guideline is to provide guidance on log book entries.

Log book entries
Section 21.4(1) of the *Regulation* provides that "the blaster of record must record in a log the preblast loading details and the results of the postblast site inspection." The "blaster of record" is defined in section 21.1 as the "blaster who is designated to be in charge of a blasting operation." This person must complete the log in person; it cannot be assigned to another individual.

The blaster is required to record certain information in the blasting log. This information is outlined in the Blaster's Handbook which is issued to blasters who have registered and paid for a blasting exam. Various formats for a blasting log may be used as long as they contain all the required information.

For a PDF example refer to the Blast Design Log (form 50M8).

Maintain a personal log
In addition to the main log, section 21.4(4) states that "the blaster must maintain a personal log of all blasting work that the blaster has performed." This log may be used or required to establish proof of experience when seeking certification under section 21.8. The blaster's helper should also have copies for future certification application.

Only the log for the current operation needs to be available at the blast site.

G21.5(1)-1 Scope of blasting certificates issued by WorkSafeBC

Issued April 9, 2019

Regulatory excerpt
Section 21.5(1) of the *OHS Regulation* (*"Regulation"*) states:

> (1) Only the holder of a valid blaster's certificate issued by the Board or acceptable to the Board is permitted to conduct or direct a blasting operation, and then only if the work involved is within the scope of that certificate.

Section 163 of the *Workers Compensation Act* (*"Act"*) states, in part:

> The Board may
>
> ...
>
> (c) issue, renew and amend certificates to blasters and instructors,
>
> ...

Purpose of guideline
The purpose of this guideline is to identify and describe the scope of work for the various qualification/types of blaster's certificates as issued by WorkSafeBC under section 163 of the *Act* for the purpose of compliance with section 21.5(1) of the *Regulation*.

Qualification
Blasting certificates issued in B.C. by WorkSafeBC are identified by blasting qualification/type along with endorsements. This information is found

on the back of the blasting certificate and determines the scope of work allowed by the holder of the certificate.

Qualifications (may be more than one) will appear on the back of the certificate, and there may also be multiple endorsements. More information can be found at worksafebc.com. The following identifies the possible qualifications/type of certificates, and describes the scope. The scope may be restricted or enhanced by specific identified endorsements that will be included on the certificate.

Avalanche Control â€“ Avalanche control blasting is the use of explosives to reduce the magnitude of spontaneous destructive avalanche occurrences. This is accomplished by triggering smaller, less hazardous avalanches or by directly influencing the structure of the snow pack.

Surface Blaster, First Class (formerly identified as Urban Blasting) â€“ The scope includes blasting within a regional district, city, town, village limits, or within 300 metres of a potentially occupied structure.

Surface Blaster, Second Class (formerly identified as Construction blasting) â€“ The scope includes blasting adjacent to transport corridors, near utilities, services, and within regional districts where occupied buildings or structures are greater than 300 metres away.

Surface Blaster, Third Class (formerly identified as Forestry blasting) â€“ The scope includes blasting for resource roads, quarries, utilities, or construction in remote areas where occupied buildings and significant structures are greater than 750 metres away.

Danger Tree â€“ The scope includes the use of explosives to remotely fall hazardous trees such as snags and limb-tied trees encountered in forestry operations as required by section 26.26(3) of the *Regulation*. The holder must also be a certified faller.

Seismic â€“ The scope is blasting used in the exploration of subterranean resources such as mineral, oil, or gas. Most workers in the oil and gas industry generally hold a certificate from Energy Safety Canada â€“ refer to *OHS Guideline 21.5(1)-2 Authority to blast â€“ Certificates acceptable to WorkSafeBC*.

Explosive joining â€“ The scope is specific to the use of high explosives to repair or join powerlines, pipelines, or to harden steel.

Explosive ordnance disposal â€“ The scope is specific to removing and disposing of unexploded explosives, including artillery, IED (improvised explosive device), munitions, etc.

Underground â€“ The scope is specific to non-resource related blasting in an underground setting (not for the purpose of mining) and includes tunneling for roadways or hydro-electric projects.

Law enforcement â€“ The scope is specific to law enforcement agencies that utilize explosives to breach targets.

Demolition â€“ The scope is specific to blasting for the purpose of demolition. Examples would include bridges, buildings, or structures such as radio or water towers. This qualification may be restricted to a prescribed distance from occupied buildings or transport corridors.

Propellants/Other â€“ The qualification will include unique applications or operations not otherwise listed above. Includes the use of low explosives or propellants to blast in-situ rock.

For further description and requirements of blasting certification, refer to worksafebc.com.

G21.5(1)-2 Authority to blast - Certificates acceptable to WorkSafeBC

Issued August 1999; Revised September 21, 2011; Revised March 31, 2015; Editorial Revision November 21, 2017; Editorial Revision April 9, 2019

Regulatory excerpt
Section 21.5(1) of the *OHS Regulation* ("*Regulation*") states:

> (1) Only the holder of a valid blaster's certificate issued by the Board or acceptable to the Board is permitted to conduct or direct a blasting operation, and then only if the work involved is within the scope of that certificate.
> ...

Purpose of guideline
The purpose of this guideline is to set out the blaster's certificates that are acceptable to WorkSafeBC under section 21.5(1) of the *Regulation*.

Seismic blasting and/or oil well perforating
A Memorandum of Understanding (MOU) has been signed by WorkSafeBC and regulatory agencies in Alberta, Saskatchewan, Manitoba, Yukon, the Northwest Territories, and Nunavut, which are members of the Interprovincial Blaster Harmonization Committee (IBHC). The certificates issued by Energy Safety Canada (formerly Enform) will be recognized as valid blaster's certificates by every jurisdiction signing the MOU.

Note: As of October 2017 Enform has merged with the Oil Sands Safety Association (OSSA) to form Energy Safety Canada. At this time Enform certificates are still recognized as valid. Moving forward certificates will be re-branded as they expire and are renewed.

A blaster's certificate endorsed for either seismic or oil well perforating issued by WorkSafeBC will still be valid for this type of blasting within British Columbia, but will not be recognized within the other jurisdictions. However, this type of certificate may be recognized as proof of

experience pursuant to the *Agreement on Internal Trade* or the *Trade, Investment and Labour Mobility Agreement*.

Pyrotechnic blasting in the performing arts and film industry
An MOU has been reached between WorkSafeBC and the Explosives Regulatory Division, Natural Resources Canada ("Explosives Branch") to recognize one common certification program that will ease the administrative burden for the two agencies and allow worker relocation within the industry. The MOU states that WorkSafeBC will recognize the certification issued by the Explosives Branch. The Explosives Branch agrees to allocate time for selected WorkSafeBC prevention officers to present the requirements of the *Regulation* during training programs conducted in British Columbia for the subject industries.

The parties agree to notify each other immediately of the occurrence of any incidents, accidents, sanctions, suspensions, and revocations. The parties also agree that WorkSafeBC will have primary responsibility over the site of any workplace incident but the parties will jointly investigate any accident, incident, or dangerous or unusual occurrence.

Refer to Guideline G21.83 for information contained in Addendum 1 of the MOU that outlines the procedures for prevention officers investigating a complaint or incident involving pyrotechnic blasting in the film or performing arts industry.

Underwater blasting
Refer to Guideline G21.82 for underwater blasting operations and requirements of the blaster of record and the diver.

G21.7 Training

Issued August 1999; Editorial Revision May 9, 2014

Regulatory excerpt
Section 21.7 of the *OHS Regulation* ("*Regulation*") states:

> A worker engaged in loading, unloading, or conveying explosives must be trained in the proper means for handling the explosives, the hazards of fire and mishandling and the procedures to follow in the event of a fire or explosion.

Purpose of guideline
The purpose of this guideline is to provide a reference to the *Transportation of Dangerous Goods Regulation* (TDG) which encompasses the training required.

***TDG* Training**
Section 21.5 outlines the requirements for workers who may conduct, supervise or assist during a blasting operation. Section 21.7 applies to workers transporting or handling explosives for the purpose of transporting explosives. The federal *TDG Regulation* (Part 6) requires that all workers engaged in these activities be adequately trained. Workers must have adequate training and a "Training Certificate" issued by the employer as referenced in Part 6 of the *TDG Regulation* and be able to provide that certificate, or a copy of it, immediately on request.

Note that a training certificate for transport by road vehicle, railway vehicle, and ship will expire after 36 months. Transport by aircraft after 24 months.

G21.69 Blasting signals

Issued August 1999; Editorial Revision June 15, 2012; Editorial Revision September 19, 2014; Revised consequential to June 3, 2019 Regulatory Amendment

Regulatory excerpt
Section 21.69(1) of the *OHS Regulation* ("*Regulation*") states:

> (1) The blaster must ensure that an audible signalling device, distinct from other signalling devices in the area, is used to give the following warning signals:
>
> (a) preceding the blast, 12 short whistle signals must be sounded at one second intervals;
>
> (b) two minutes must elapse after the last warning signal before initiating the blast;
>
> (c) following the blast and after the area has been inspected and found safe, one prolonged whistle signal of at least 5 seconds duration must be sounded, to signify that permission is granted to return to the blasting area.
>
> (2) Subsection (1) does not apply to oil and gas downhole explosives operations, avalanche control, single underground headings, buried seismic work in isolated locations or other circumstances deemed appropriate by the Board, in which case the blaster must ensure that alternative warning procedures acceptable to the Board are used.
>
> (3) Subsection (1)(b) does not apply with respect to the 2 minute warning in congested areas if alternative warning procedures acceptable to the Board are developed and implemented.

Purpose of guideline

The purpose of this guideline is to clarify how to request acceptance of alternate warning procedures under sections 21.69(2) and (3) of the *Regulation*. It also provides alternate warning procedures that are considered acceptable to WorkSafeBC for oil and gas downhole explosives operations.

Requesting acceptance

Section 21.69(1) of the *Regulation* contains requirements for warning signals. Section 21.69(2) and (3) allow exceptions in certain situations as long as alternative warning procedures acceptable to WorkSafeBC are used. With the exception of alternate procedures for oil and gas downhole explosives operations, requests for approval of procedures must be in writing and submitted to Certification Services. The request must include full details of the proposed procedures, including site security, guarding, and procedures for warning workers and the public. Acceptance may be granted for continuous operations within the scope of the request.

Acceptable alternate procedures for oil and gas downhole explosives operations

Section 21.69(2) of the *Regulation* allows alternate procedures for oil and gas downhole explosives operations. In the case of oil and gas downhole explosives operations, a formal request in writing and submitted to Certification Services is not required if the following procedures are documented and available on site:

- Written procedures including site security, guarding, and procedures for warning workers and the public.
- There must be appropriate signage on the location where explosives are being used for downhole operations. The signs must be placed immediately outside the arming area and at the entrance to the oil or gas lease to communicate to everyone entering the wellsite that downhole explosives operations are being conducted on the site.
- There must be a process for all workers on the site to be advised when downhole explosives operations are being conducted on the site.
- There must be a clear, reliable and documented communication procedure between the wireline company's and the oil company's on-site representative.