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TITLE 8, DIVISION 1, CHAPTER 4

Subchapter 7. General Industry Safety Orders
Group 18. Explosives and Pyrotechnics
Article 121. Snow Avalanche Blasting
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§5349. Scope.

The provisions found in Article 121, Snow Avalanche Blasting, shall only pertain to snow avalanche control operations, and shall take precedence when in conflict with other applicable safety orders.

(a) Definitions.

~~Deploy. The act of throwing, placing, tethering or propelling a charge into position for detonation.~~

~~Position of Safety. A location where an employee is isolated or protected from hazards of blasting or the ensuing avalanche.~~

Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§5349.1. Definitions.

(a) Definitions.

Essential Personnel. Those individuals directly involved with the arming, the deployment of charges, transportation and site clearing to facilitate transportation. Non-essential personnel are all other individuals.

Explosive Charge (also referred to as a "charge"). A measured quantity of explosive material designed to produce a controlled release of energy for the purpose of initiating a snow avalanche or mitigating snow avalanche hazards.

Deploy. The act of throwing, placing, **dropping**, tethering or propelling a charge into position for detonation **with the intent of triggering a snow avalanche.**

Position of Safety. A location where an employee is isolated or protected from hazards of blasting or the ensuing avalanche.

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Remote Avalanche Control Systems (RACS). Devices that are remotely initiated by essential personnel from a position of safety with the intent of triggering a snow avalanche. RACS typically use a combination of gasses or deploy one or more preinstalled charges to generate a sudden increase in air pressure at a predesignated location.

Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§5350. Training.

(a) The avalanche blasting crewmembers shall be adequately trained in the explosives and the deployment method(s) used.

(b) Training for members of the blasting crew shall ensure competence in the following areas:

(1) A general knowledge of explosive materials, history of their development, their properties and requirements for their safe use and management;

(C) Procedures for clearing and guarding the ski lifts, blasting areas, slopes, and runout zones pursuant to requirements in Section 5356(c)(5), Section 5357(a)(2)(3), Section 5357(b)(6) and Section 5357(e)(3) where applicable.

(e) Essential personnel, as defined in the Note in Section 5355.1(a), other than avalanche blasting crewmembers, shall be adequately trained and competent in their blasting related duties and in the following:

(2) Clearing adjacent areas pursuant to requirements in Sections 5355.1(a)(1) and (3), Section 5356(c)(5), 5357(a)(2)(3), Section 5357(b)(6) and Section 5357(e)(3) where applicable;

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Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§5355.1. Arming Room.

(a) Location of Arming Room.

(3) Only authorized and essential personnel to the operation shall be allowed within the arming room and within the equivalent distance to occupied structures required by the Table of Distances for the amount of explosives present. ~~NOTE: Essential personnel are those individuals directly involved with the arming, the deployment of charges, transportation and site clearing to facilitate transportation. Non-essential personnel are all other individuals.~~

Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§5357. Snow Avalanche Control Blasting.

(a) General Requirements.

(1) The employer shall develop and implement effective, written procedures for avalanche control blasting to ensure the safety of avalanche blasting crewmembers during all phases of avalanche control blasting.

(A) The procedures shall be reviewed and updated as often as necessary to ensure that the procedures reflect current, safe operating procedures.

(B) The procedures shall include at a minimum:

1. Recognition of avalanche and blasting hazards;

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2. Access to deployment zones;

3. Communication among avalanche blasting crewmembers;

4. Pre-selection of position(s) of safety and terrain barrier(s);

5. Handling, arming, and deploying of explosives; and

6. Emergency response and rescue.

(C) The employer shall provide for the effective participation of avalanche control blasting crewmembers in the development of safe avalanche control blasting procedures.

(D) The employer shall ensure that all avalanche control blasting crewmembers are competent in the avalanche control blasting procedures.

(E) The employer shall provide effective training on the avalanche control blasting procedures to avalanche blasting crew members at least annually.

1. The training shall be conducted prior to the first blasting operation of each avalanche control season.

2. The employer shall provide an opportunity for interactive questions and answers on avalanche blasting procedures with a licensed avalanche blaster knowledgeable and experienced with the procedures.

EXCEPTION to subsection (a)(1)(E): If no blasting occurs during the entire avalanche control season, then training on the procedures is not required for that season.

(1)(2) All avalanche blasting shall be conducted under the attended supervision of the blaster in charge who is a licensed avalanche blaster, certified by the Division Cal/OSHA to perform such blasting activities.

(2)(3) When avalanche blasting is deemed necessary, slopes and trails in the potential avalanche path (runout zone) and ski lifts shall be closed to the public and non-essential personnel and not be opened until the work is completed.

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~~(3)~~(4) To ~~insure~~ ensure a dry powder train is exposed to the igniter, at least 1 inch of fuse shall be cut from the fuse prior to attaching the igniter. A cutter with sharp blades shall be used to prevent smearing of tar over the powder train.

~~(4)~~(5) Charges shall be placed, thrown or propelled to the desired location from a safe position by one of the following methods:

(E) Deployed from such remote avalanche control ~~devices~~ systems (RACS) ~~accepted by the Division as providing equivalent safety to the remote control devices allowed under~~ pursuant to subsection ~~(e)~~(f).

~~(5)~~(6) Avalanche blasting shall be conducted during daylight hours, except as provided in subsection (f) or during emergency operations.

~~(6)~~(7) Avalanche blasting shall not be conducted during conditions where the blaster cannot determine whether the fuse is lit, or clearly identify the location of the target area for the detonation of the charge, except as provided in subsection (f).

(b) Hand Deployed Charges (handcharges).

(3) The handcharge shall be lowered by rope, cord or a long pole to the designated location when there is danger that the charge may slide downhill.

(4) Before attaching the igniter, the blaster shall:

(A) Determine the ~~deployment target;~~ location where the handcharge is intended to land;

(B) Determine a pre-selected position of safety as follows:

1. A terrain barrier, or

2. If a terrain barrier is not available, a position of safety at least 100 feet from both the location where the handcharge is intended to land and the location from where the blaster deploys the charge.

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EXCEPTION to subsection (b)(4)(B)(2): The location of deployment is a position of safety that is not less than 100 feet from the location of detonation and where moving to the pre-selected position of safety creates a greater hazard.

~~(B)(C)~~ Check the runout zone personnel;

(C) Ensure there is no personnel in any location that could be affected by snow avalanche mitigation activities, including but not limited to the blast area, the avalanche path or runout zone and adjacent areas where flying debris, shockwaves, or vibrations could pose a hazard, such as buildings with glass windows or other fragile structures; and

~~(C)(D)~~ Check the blast area for personnel; and

~~(E)(D)~~ Orally alert all affected crewmembers each time a charge will be deployed.

(5) When the blast area and runout zone are clear of personnel, the blaster igniter shall ~~be attached to the igniter onto the safety fuse, and immediately activated it and the charge deployed~~ the charge within 20 seconds of ~~attaching the igniter onto the fuse.~~

~~(6) Avalanche blasting crewmembers shall seek a position of safety behind a pre-selected terrain barrier or a position not less than 100 feet from the ignited charge.~~

(6) Only a licensed avalanche blaster, certified by the Division Cal/OSHA to perform avalanche blasting activities, or a person trained in accordance with subsection (a)(1)(D) who is being directly supervised by a licensed avalanche blaster shall ignite or deploy a handcharge.

(7) Prior to any handcharge being ignited, avalanche blasting crewmembers not involved in igniting or deploying the handcharge shall be behind the pre-selected terrain barrier or remain in a position of safety as described in subsection (b)(4)(B). Each crewmember shall orally report to the blaster-in-charge the crewmember's position of safety, and the blaster-in-charge shall orally acknowledge the report or, when necessary, re-direct the crewmember to another position of safety.

(8) Immediately following the deployment of a charge, the avalanche blasting crewmember responsible for deploying the charge shall move or be behind the pre-selected terrain barrier or to the other position of safety described in subsection (b)(4)(B)

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~~(7)~~(9) At the completion of individual avalanche control routes, unused charges shall be deployed or disarmed pursuant to Section 5358(h)(1) and all components transported and returned to approved storage magazines pursuant to requirements in Article 121. Exception to subsection (b)(9): Unused charges that are immediately required for deployment at another location.

(f) Remote avalanche control system (RACS) requirements.

(1) The operation of a RACS shall be under the direct supervision of an authorized, licensed avalanche blaster.

(2) Only trained and authorized personnel shall be permitted to operate a RACS.

(3) RACS with no possibility of exposing employees to explosive hazards from the handling, storage, or deployment of explosive materials shall be installed, maintained, serviced, and repaired according to manufacturer's instructions and shall be excluded from the requirements of subsection (f)(4), e.g. gas-based systems.

(4) RACS with any possibility of exposing employees to explosive hazards shall comply with the following requirements:

(A) ~~During~~ The loading and firing of explosive rounds shall only be done by essential personnel who have been trained in accordance with the manufacturer's instructions on the specific system in use. Such actions shall only be performed with the authorization of the blaster-in charge. the firing crew shall consist of the blaster in charge, one trained operator, and/or one blaster in training. All other personnel shall be removed to a minimum of 100 feet from the RACS before firing can commence.

(B) All equipment and components shall be in good working condition, and shall be assembled, maintained, repaired and operated in accordance with the manufacturer's instructions.

~~(C) The components of RACS shall be replaced, assembled and used in accordance with the manufacturer's instructions.~~

~~(D)~~(C) The explosives and related components shall be inspected before transport to the RACS site and again immediately prior to being loaded or installed into the RACS. These inspections must to ensure proper working condition, and shall be that they are

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free from damage, obstructions, dirt and debris. ~~Defective RACS explosive and related components shall not be used and shall be properly disposed of or returned to the manufacturer.~~

~~(E) Defective RACS components shall not be used and shall be properly disposed of or returned to the manufacturer.~~

~~(F) The RACS safety devices or components shall not be removed, unless recommended by the manufacturer and is approved by Cal/OSHA.~~

~~(G)(D) Operators shall attempt to determine and record whether or not each explosive detonates~~ initiation is successful.

~~(H)(E) The approximate location of all known or suspected misfires shall be recorded.~~

~~(I)(F) Firing of explosive~~ Initiation of RACS shall only be conducted when personnel are not in the target any area where they could be injured by avalanche mitigation activities, including but not limited to the blast area, avalanche path and runout zone.

~~(J)(G) The RACS shall be stored in a nonfunctional condition when not in use or shall be locked securely to prevent unauthorized use. The RACS and its components shall be locked and secured without putting personnel at risk of injury according to the manufacturer's instructions and the requirements of the appropriate Federal, State, or local regulatory authorities.~~

~~(K)(H) The employer shall comply with the written procedures required by subsection (a)(1) and have a copy of the procedures along with the manufacturer's name and supplier of the RACS available onsite for Cal/OSHA to review and copy.~~

~~(L)(I) Documentation from the explosives manufacturer of the explosive energy and destructive power for each charge used shall be obtained by the employer and readily available to all affected employees. If such documentation is not available, a blast study to determine this information must be performed. The explosive energy and/or blast study documentation shall identify the harmful range of blast waves.~~

~~(M)(J) RACS utilizing explosives mated to their initiation system and handled by an employee must use safety fuses that~~ with ignition properties that are clearly identifiable by all persons who are not within a position of safety have an "ignition spit" that is visible from 25 feet away at initiation conditions during the arming and deployment processes. After ignition, the fuse must look dissimilar than before ignition of the safety fuse.

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