

**WAC 296-52-807 Avalanche control blasting.** (1) You must ensure that all members of avalanche control blasting crews are competent ski mountaineers in good physical and mental condition.

(2) Each avalanche control blasting crew or team must consist of a qualified and licensed blaster and at least one trained assistant.

(3) Untrained personnel may accompany blasting crews for training purposes but must not participate in actual firing of charges until trained and authorized.

(4) The blaster in charge of each crew or team must be responsible for all phases of preparation and placement of charges.

(5) Avalanche control blasting should be conducted during daylight hours whenever possible.

(6) Escape route.

(a) The avalanche control crew or team must preplan the escape route before igniting any charge.

(b) The escape route must be as safe and foolproof as possible and must culminate behind a terrain barrier or at least one hundred feet from the blast site by the time of detonation.

(7) Hand-thrown charges.

(a) A blaster must only work with one charge at a time.

(b) Before attaching the igniter, the blaster must:

(i) Be at the start of the escape route;

(ii) Check the runout zone for personnel;

(iii) Check the blast area for personnel.

(c) After the blaster attaches and activates the igniter:

(i) The blaster must check to see that the fuse is ignited;

(ii) If the fuse did not ignite, no attempt must be made to re-light it. The blaster must immediately remove the fuse cap from the charge to sidarm it. The fuse cap must be treated as a misfire and be put in an appropriately safe place separate from all other explosive components. It must not be approached for at least thirty minutes, after which time it must be properly disposed of;

(iii) The practice of double fusing hand charges must be allowed. An attempt must be made to light both fuses. If only one of the two fuses lights, the charge must be deployed as normal;

(iv) As soon as the fuse is ignited, the blaster must promptly throw the charge into the target area;

(v) All personnel must be in a safe place when the charge detonates.

(d) Where hand-thrown charges will slide down the hill on hard frozen snow or ice surface, charges must be belayed with light cord.

(8) Hand charges thrown from ski lifts or trams.

(a) The number of charges thrown from ski lifts or trams must be kept to a minimum.

(b) The lift operating crew must be informed of the blasting plans.

(c) The lift crew must stand by for emergency procedures such as transfer of lift onto auxiliary power, evacuation, etc.

(d) The lift crew and the blaster in charge must be in direct radio contact at all times during the blasting operations.

(e) Only the avalanche control blasting crew and the essential lift operating personnel must be on a lift or tram during blasting operations.

(f) The avalanche control blasting crew must be traveling up slope when a charge is thrown.

(g) A charge must always be thrown down slope and to the side, away from towers, haulropes and other equipment or facilities.

- (h) The minimum distance from the blast target to the closest point of the lift must be sixty feet.
- (i) Hand charges must not exceed 4.5 pounds of TNT equivalent.
- (j) Fuses must be timed and cut to such length that all personnel on the lift will have moved a minimum of three hundred feet from the blast target by the time of detonation.
- (k) Precautions must be taken to avoid tossing charges into any of the lift equipment, moving chairs, cables, towers, etc.
- (9) Aerial avalanche control blasting.
  - (a) Blasting from aircraft will require a written program approved by the Federal Aviation Administration and the director, or designee of the department of labor and industries.
  - (b) A written program must include the following:
    - (i) Written procedures to be followed including provisions for safety in the avalanche runout zone and emergency rescue plans.
    - (ii) Hand charge makeup and handling procedures.
    - (iii) The type of explosives to be used.
    - (iv) The qualifications of all avalanche control personnel involved in aerial blasting must meet the requirements of WAC 296-52-64030.
    - (v) The specific locations where aircraft blasting is to take place.
  - (c) An aerial avalanche control team must be established consisting of (at minimum) a pilot, a blaster in charge and an observer/controller.
  - (d) Blasting from an aircraft must require the blaster in charge to be a licensed avalanche blaster with an endorsement for aerial blasting. The blaster in charge will be on board during each aerial blasting mission.

**Note:** Blasting from aircraft should only be used when it is determined that conventional methods are not the safest means to mitigate the existing avalanche hazard.

- (10) Avalauncher requirements.
  - (a) Management must develop a written training program and ensures that every person who will be authorized to work on an avalauncher firing team is thoroughly trained. Training must include:
    - (i) All operating instructions;
    - (ii) Safety precautions;
    - (iii) Emergency procedures;
    - (iv) Securing requirements for the equipment.
  - (b) You must have a list of authorized operators listed on a posted operator's list.
  - (c) Only trained and authorized personnel must be permitted to point and fire an avalauncher with explosive rounds.
  - (d) During firing of explosive loaded rounds, the firing team must consist of two qualified operators and not more than one adequately trained helper.
  - (e) Operators must have a current state blasting license.
  - (f) Each operator must individually check the elevation, pointing and pressure settings of the gun before each shot is fired.
  - (g) Operators must attempt to determine and record whether or not each round which is fired actually explodes on contact.
  - (h) The approximate location of all known misfired explosives (or duds) must be recorded.
  - (i) Initial shooting coordinates for each avalauncher mount must be made during periods of good visibility.
  - (j) Testing must include test firing in various wind conditions.

- (k) The correct coordinates for the various conditions encountered must be carefully recorded.
- (l) When spotter personnel are used in the target area, shooting must be conducted with nonexplosive projectiles.
- (m) Firing of explosive avalauncher rounds must only be conducted when personnel are not in the target area.
- (n) The avalauncher apparatus must be stored in a nonfunctional condition when not in use. This must be accomplished by:
  - (i) Locking out the firing mechanism or gas source in accordance with the lockout requirements of this chapter; or
  - (ii) Disassembly of functional components rendering the gun inoperable and separate storage of components removed; or
  - (iii) Removal of the entire gun to secure storage.
- (o) With established avalauncher mounts, each autumn when reinstalling guns, the following procedures must be accomplished before the gun is considered operable:
  - (i) All components must be carefully inspected by qualified personnel;
  - (ii) After assembly and installation, the gun must first be test fired using a nonexplosive projectile;
  - (iii) The established firing coordinates must be checked by test firing.
- (11) Cornice control requirements.
  - (a) Cornice buildup hazards must be evaluated regularly by qualified personnel, particularly after heavy snowfall periods which are accompanied by high wind or other snow transport weather conditions.
  - (b) Cornice hazards must be controlled whenever the buildup appears to offer potential hazard to areas accessible by personnel.
  - (c) The control team must establish the tension breakline of the cornice roof as accurately as conditions permit before starting any other control work on the cornice.
  - (d) The tension breakline must be marked when necessary.
  - (e) Small lightly packed cornices may be kicked off with a ski, ski pole, or shovel by an unbelayed control team member if the ridge-line can be clearly established and all work can be done from the safe side of the ridgeline.
  - (f) When working along an anticipated cornice breakline, control team members must retreat back from the breakline to change work positions rather than traverse along the breakline.
  - (g) The following factors must be given careful consideration before commencing control activities on any relatively larger cornice:
    - (i) The older and larger a cornice becomes, the more densely it compacts. Densely packed cornices release into larger blocks offering a higher level of danger to an extended runout zone. The control team leader must therefore take highest level of precautions to assure that the runout zone is clear of personnel;
    - (ii) Larger size cornices result in increased suspended weight and leverage which may cause the breakline release fracture to occur behind the actual ridgeline. The actual ridgeline may also be obscured by the simple mass of larger cornices. Control team members must stay off the cornice roof and must be protected by a secure belay when working near the suspected breakline;
    - (iii) All large cornices must be released by explosives. Explosives must be transported, made up and fired in accordance with the following requirements:
      - (A) The ignition system for single hand charge blasts must be safety fuse and cap or a system approved by the department.

(B) Detonating cord or shock tube must be used to connect multiple charge blasts.

(C) When detonating cord is used, one end must be securely anchored where premature cornice collapse will not disturb the anchor. The fuse and cap must be attached to the free end of the detonating cord after all charges are connected to the detonating cord.

(D) Safety fuse length must be sufficient to permit adequate escapement time for all personnel from the area influenced by the blast. Safety fuse must be not less than three feet long, approximately two minutes and twenty seconds, in all instances.

(h) Cornice control work on large cornices must be conducted during daylight hours and preferably during favorable weather conditions. As a minimum, clear visibility must exist across the full length of any cornice which the control team is attempting to release.

(12) Belaying practices.

(a) Belay rope must be standard 11 mm mountaineering rope or the equivalent.

(i) Belay rope must be inspected at not less than thirty-day intervals and maintained in excellent condition.

(ii) Defective belay rope must not be used for belaying purposes.

(b) Adequate trees or other suitable natural belay anchors must be used in preference to a human belay anchor when such natural anchors are available.

(c) The belay anchor position must be as near to ninety degrees from the tension breakline as the terrain conditions will permit.

(d) With either a natural belay anchor or human belay anchor, the belay line must be tended to keep slack out of the line.

(e) When either the belayed person or belay anchor needs to change position, the belayed person must retreat back from the cornice to a safe position until the belay anchor is reestablished.

(f) When a human belay anchor is used:

(i) The belay anchor person must establish the anchor position as far back away from the cornice as conditions permit;

(ii) The anchor person must remain in a seated position with their legs pointed toward the belayed person until such time as the belayed person has retreated back from the cornice to a position considered to be safe.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 17-16-132, § 296-52-807, filed 8/1/17, effective 9/1/17; WSR 06-19-074, § 296-52-807, filed 9/19/06, effective 12/1/06.]