

Alpental Ski Area Avalanche Accident, Alpental, WA—01/30/2001

One Professional Patroller caught, totally buried and rescued

Weather and Avalanche narrative compiled by Rob Gibson, WSDOT Avalanche Control,
Snoqualmie Pass; photos by Rob Gibson

Accident Summary--

The avalanche was classified as a **SS-AS-1F** (US Classification), Soft slab, released by skier, size 1 (but pretty large for this small path) flowing avalanche, approximately 18 inches (.5 m) deep X 50 ft wide.. Slope aspect was east-northeast, elevation ~4200 ft (1280 m), with slope angle at the fracture line of about 30°. Vertical fall of the slide was approximately 50 ft (about 90 ft slope distance), ending in a flat bench/terrain trap at the bottom.

In the International Avalanche Classification, this slide would be classed as a:

Zone of Origin--A3-B2-C1 (Soft slab, new snow fracture, dry snow avalanche)

Zone of Transition--D1-E2 (Channeled avalanche, flowing along the ground)

Zone of Deposition--Unknown at this time, however the debris was reported as mostly coarse and dry at the time of deposition

A 50 year average snowfall for January on Snoqualmie Pass is 112", but January 2001 had been a small snowfall month in the central Cascades. Several weak storms early in the month ended with warmer, rainy periods resulting in shallowly buried crusts. One in particular formed an approximately 1 cm lens on the 7th. Cool periods between systems, and very light snowfall made good conditions for surface hoar growth. A total of 30" had fallen for the month as of the 29th, with the most snowfall for a 24 hour period being 5.5" on the 21st. Warming at the end of this small storm left a brittle freezing rain crust followed again by cool weather, light snow, and surface hoar. A welcome change in the storm track brought precipitation overnight through the 28th-29th. 3" of new snow buried the surface hoar by 0600 1/29. Snow continued through the daylight hours of the 29th, decreasing after dark, and resulting in another 8" of new by 0600 1/30 with a W.E. of .86". It continued to snow throughout the day 1/30 bringing another 11.5" by 0600 1/31 (1.82" W.E.)

Alpental Ski Area, in a box canyon just north of I-90 on Snoqualmie Pass, WA does not operate most Mondays. Other than the patrol manager in for a morning observation, there were no activities at the area 1/29. Patrollers started shift at 0730 on 1/30, and after a morning briefing, avalanche control routes were assigned. Route leaders were reporting easily triggered soft slabs 6"-10" deep, and the large airblast bombs used to control the big cliff areas moved a lot of the loose new snow onto the runs below, entraining more snow and

running about average distances for these type of conditions. Debris was soft and conditions quite good.

The avalanche control progression for the ski area targets major paths affecting the lower portion of the ski area to be completed first. Once these are completed, the lower lifts can be opened to guests and control workers finish areas affecting only the upper lift, Edelweiss. There is also a marked area boundary between the developed resort and an area known as the backcountry. This area is accessed through a gate system, and opened only when conditions permit. The upper portion of the backcountry sees very little control work other than removal of large cornices or unusually persistent weak layers. It is usually left to natural snowpack stabilization. The more easily accessible lower portion (the near backcountry) gets active control work after storms, both with explosive and ski testing, and is controlled as the third priority. It is also entered through gates, and guarded during control activities if the upper mountain is open. The boundary line between the normally open slopes and the backcountry is known to the patrol as the "forever rope".

Because of the local topography, and somewhat low elevation of Snoqualmie Pass, it is fairly common to have temperature inversions with warmer westerly flow aloft, and colder Eastern Washington air trapped in the valleys and draining through the low pass towards Western Washington. This allows surface hoar to form better and remain longer on these lower slopes. These conditions were more frequent than normal in December, and patrollers were watching several buried layers which persisted from mid-mountain down.

Control work affecting the upper chair was completed and that lift was opened to customers at 1030 am. Control teams headed to Elevator Shaft and The Bluffs in the near backcountry, and the run that provides access to the area was roped closed. A volunteer patrolman was stationed at the entrance as a guard. Other patrollers were in the area maintaining and checking the "forever" ropeline. The Bluffs control team members were triggering 8"-10" soft slabs beginning the route and placed a 15# test shot high at the top of Elevator Shaft. This protects the Elevator team who will come next in the progression but cannot access this highest point. The explosive released widespread soft slabs of a similar depth and a localized area to about 18". Also at this elevation deep settlements were heard and felt on shallow angle and flat slopes. This information was passed on to mountaintop dispatch. The next slope ski tested released easily to 18" and ran to a greater distance than had been seen thus far. Bed surface was an older buried ice crust. This information was also passed on to mountaintop. The route progresses on a descending right hand ski cut back toward the boundary with the regular ski area runs (still closed and guarded) and descends to an elevation that can be reached by a long traverse from the lower chair of the ski area and/or from the adjacent upper mountain run, currently open. The "forever rope" still continues down the mountain as a permanent boundary. When open, the lower backcountry areas are accessed only through gated entrances higher up. Below the Bluffs route is an open book slab of rock known as rock face, part of the lower backcountry and approximately 35 degrees. Long running slides from the Bluffs can reach Rock Face

and did on this day. As the last ski cut was made on the Bluffs, the patroller making the ski cut saw three snow boarders rapidly come into view from toward the boundary area heading toward Rock Face. They must have seen the slide and had just enough time to react, turning away quickly enough that only one was seen entering the flowing snow. The rider was lost from sight and when the snow stopped all three were nowhere to be seen.

Controllers called in a possible avalanche accident, and began a hasty search. Upon close examination the tracks out of the slide were found, it was verified that three tracks entered the area, three tracks exited and the search was called off. Not one of the bandit group stayed in the area to make sure all were accounted for. Because the Bluffs team had now gotten too low to effectively ski cut Rock Race, they exited with as little exposure as possible and reported the omission to mountaintop.

Mountaintop then dispatched the three pro patrollers who had been working on the “forever rope” to the area to complete the ski route. Peter Finely (39), Paul Schuster (39), and Bram Thrift (25) left the rope line and headed for the Bluffs. They were just outside the boundary rope and had to head across some shallow to moderate angle smallish bluffs to get to the start of the steeper normal route. These bluffs are intermixed with flatter and often opposing angle ramps.

Peter, Paul, and Bram later reported they had heard the radio reports of the control teams results. Peter was in the lead and cut across the lower one third of one of these bluffs to access a lower ramp. The ramps on this part of the mountain are generally right hand sloping and the groups route somewhat “against the grain”. The ramp Peter was moving across was about 75’ X 75’ with an approximately 5’ drop as its terminus (see the photos below). Aspect is just north of east, approximately 080 degrees with a slope angle of 30 degrees. As Pete moved across to exit, the slope fractured about 50’ above him, perhaps 50’ wide and 18” deep. Pete’s forward momentum carried him with the snow, off the short drop and onto an almost flat bench. This terrain trap left him nowhere to go. He was quickly covered by the soft debris, in a sitting position with one hand extended over his head towards the surface trying to maintain an airspace.



Figure 1. Photo looking across the accident slope ten days later; ski poles in upper right of photo indicating approximately where fracture occurred. Trusty avalanche dog Kuri is near where Pete was traversing slope toward photographer. Terrain trap is a poorly seen hollow on the other side of skis in lower left.



Figure 2. Looking upslope at same site, burial location is better seen just this side of the small, visible drop in foreground. Ski poles still outline approximate location of initial slab release. Note that subsequent snowfall and the slide from 1/30/2001 have greatly filled in the terrain trap.

Paul and Bram watched Pete move across the slope. As it fractured above him, he moved down and across the slope out of sight and they were unable to witness the actual burial. The time was 11:08am. Paul immediately advised mountaintop of the accident, reported

that there was a “hangfire” (remaining unavalanched snow) above and that he and Bram were beginning to search. He also reported that Bram had no radio. At this time Paul’s radio was accidentally changed to another channel and communication was temporarily lost with the scene. Mountaintop immediately closed the Edelweiss chair, requested all available personnel to the top, and prepared for rescue operations. Following the successful rescue, the Edelweiss chair re-opened, but that side of the mountain was kept closed. The Alpental Patrol has had a very difficult season enforcing boundaries and closures. Closure of the entire side was the only practical way to manage the access to the high hazard area.

This account is from the avalanche victim, Alpental Professional Patroller Pete Finely

Jan 30,2001 at approx. 1100 hrs

Working on rope lines in Snake Dance with Paul Schuster and Bram Thrift when over the radio came a call from the top of chair two that another safe ski pass on the right side of rock face was necessary. I responded to the call that our team would handle it. We were below the normal entrance to the Backcountry and finished working until we came to a cliff which interrupts the rope line. We cut under the rope and proceeded to ski cut above the cliffs. I was in front standing on a knob when Paul and Bram caught up to me. I then skied the edge of a small knob. The topography of the area is multi-faced knobs and small drops.

As I skied along I looked to my left at a small slope that looked like it could use ski cutting. I skied on a part of the knob that seemed like it was not going to affect that slope. I then skied off the edge of a five foot drop. On impact I stalled in soft snow in a flat spot under the slope. Immediately after I landed snow poured down on me, completely covering me.

I was carrying my ski poles in my left hand with my right hand free. As the snow poured over me I was able to make an air pocket around me with my right hand. I thought that I had, as I could see a bright area over my head through the snow. After a moment I tried to get to my radio to broadcast a distress call, while I was doing this I heard the radio call by Paul that I was buried.

I was trying to calm down when my air pocket collapsed and snow began coming down the shaft I had pushed to the surface. This promoted great stress on my part and I began to yell and choke on the snow coming down on me. After a period of time the pocket had become much smaller and I had used up most of the oxygen in it. I remember feeling calm by then and thinking that when I passed out I would use less oxygen. At about that point fresh air and light came in and someone grabbed my hand. After I was dug out enough to see my rescuers, I spoke to Paul and told him I was unhurt. Paul and Bram proceeded to dig me out the rest of the way.

I believe that I triggered the slide by breaking a fragile crust formed earlier in the month that was under the new snow, not by removing the support at the bottom of the slope.

Mistakes leading up to the incident; in no particular order:

Getting stuck in flat terrain at the bottom of the slope. If I had momentum I would have skied out of the deposition area, which only extended fifteen or twenty feet beyond where I was buried.

Lack of familiarity with the slope. I should have skied it from the top rather than around to the side and underneath the slope.

Not letting go of my poles so that I had both hands in front of me to maintain my air pocket.

This next account is a post incident report by Pro Patroller Paul Schuster

Avalanche Burial and Rescue of Ski Patroller at Alpental

(aka “The Blue Peter Incident” or “Crouching Finely, Hidden Bro”)

From the perspective of Paul Schuster, Alpental Ski Patrol

Incident Date: January 30, 2001
Incident Time: Approx 11:00 am
Incident Location: The newly named Watch Your Peter area – Slightly above and skier's left of Poon Hollow, Alpental Ski Area, Washington State

Objective Account:

After finishing our avalanche control routes that morning, Peter Finely, Bram Thrift and I were maintaining rope lines in lower Snake Dance between the Elevator entrance and Poon Hollow. We received a call that the left side Rock Face (a closed area) should be safe skied. We called in that we would head that direction to do so and then proceeded through a closed area. En route we heard and felt whumphing consistent with the morning's control results and other reports of an unstable layer 15 to 18 inches down. We were able to kick off numerous 4-6 inch deep slides but had not been able to produce a deeper slide with our skis. We went on ski cutting and followed safe travel procedures of going one at a time and spotting each other. Pete led, I was second, with Bram bringing up the rear.

While the two of us watched, Pete traversed across the face of a knob. A fracture opened up about 50 feet uphill of him on the convex portion of the slope, he yelled, and the slab carried him behind a small ridge and out of my view. I yelled, "I gotcha Pete" to re-assure him. When he went out of view he was still on his feet and in relative control. After the snow stopped I yelled to him. There was no response. The crown of the fracture was about 18 inches and there was snow remaining that could slide. I let Bram know this and that I had to move into the slide path in order to get a view of the deposition zone. With him spotting I went in for a closer look. There were no signs of Pete, his equipment, or tracks leading out. I yelled. Again, no response. I let Bram know there was no sign and gave a short report on the radio of our position, that Pete was buried, Bram didn't have a radio, there was hang-fire, and I was going to search for him. I got confirmation and headed in.

Just before I reached the debris Bram switched his transceiver to receive and suggested I do the same. I did and immediately picked up a signal. Once I got to the debris I started a grid search and heard a yell from under the snow. I told Bram I could hear Pete and he asked if he should come down. From the vantage of the deposition zone it appeared as though the remaining snow above would not pose much of a threat even if it slid and I agreed he should come on down to assist. I got my shovel out, started digging where I thought the voice originated from, and had Bram to do the same. Because we last saw him upright and could hear him I expected he was near the surface and we would either uncover him quickly or bump into him or his gear. We heard another yell just to the side of where we were digging and re-focused our efforts there. It became apparent that he wasn't just below the surface and we probably wouldn't find him with a scuff search. While I used my transceiver to pinpoint, Bram put his probe together. I directed the probe and he got a strike. It was a hard strike. I started digging at the spot. Not knowing if this was part of Pete's gear or a branch, a rock, or a chunk of ice I had Bram fine probe near his first strike. He indicated a soft strike, left the probe in place, and assisted with the digging.

We uncovered Pete's hand about three feet below the surface. It was moving and had a firm grip. While Bram dug down the arm I dug an exit trench downhill so he could move snow faster. Bram uncovered Peter's face about four and a half feet below the surface. His lips and the skin around them were blue but he was conscious and breathing. Bram continued to excavate while I asked Pete if he had any injuries. He reported none. I reported on the radio that we had found Pete, he was breathing, reported no injuries, and gave a more complete description of our location. Shortly thereafter, while we were still digging him out, a group of patrollers arrived who had been dispatched from the top of Chair

2 after my first report. While they spotted us we dug out the rest of Pete and his gear then gathered up and moved out of the slide area. Pete finished out his workday in apparent good health and humor.

From my first radio report to the second was approximately six minutes, according to incident command at the top of Chair 2. Pete was found in an upright, crouched position with his left hand extended upward and his right hand near his chest. The slab was moderately hard and about 75 feet top to bottom (approximately 30 feet vertical) and 50 feet wide. The crown varied from about 15 to 18 inches. From the point that Pete started moving with the snow to where we found him was about 50 feet, (approximately 20 feet vertical). The base of the slide path was over an approximately ten-foot ledge onto a flat area and also involved a side slope to form half a gully. This terrain trap explains the relatively deep burial.

Subjective Analysis:

Safe travel practices saved at least one life. At best, we could not have responded as quickly if Bram or I had been caught in the slide.

It would have been good if Bram had had a radio. Because of how we were spread out, the terrain, and the nature of the remaining snow above I was not able to hand mine off to him.

Teamwork and coordination among the rescuers was essential. In addition, the communication and suggestions to each other saved time.

Bram did an excellent job as a spotter by staying calm and offering suggestions. I was very thankful to have him on site.

Confirming the exact burial location with a probe before digging can save a great deal of time.

Had this been a shallow burial we might have saved a minute by going directly after the voice with a scuff search. However, given that he was fairly deep, we might have saved a minute or so had I not suspended my transceiver search. Given the situation we were presented with it is unclear to me whether I should have continued my transceiver search or went directly to voice with a scuff search as we did. Fortunately, we realized quickly that we weren't going to find him with the scuff search.

In general, I assumed and planned on a quick find. I had taken my gloves and parka off so I could move quicker, have better access to my transceiver and radio, and have better dexterity. By then end I was starting to get cold. Similarly, I suspended my transceiver search for a scuff search expecting to find Pete by voice just below the surface. We also did not take the time to put my probe together until we suspected he was deep. Although these things would have saved time for a shallow burial a better practice may be to assume a deep burial in all cases since time lost on a shallow one is not as likely to be

as critical.

Had we been without any of the following: transceivers, probes, or shovels, it would have taken us significantly longer to find Pete. Bram is an experienced mountaineer and competent patroller. I have fifteen years of patrolling experience and am currently an Avalanche Safety instructor for the National Ski Patrol. As members of the Alpental Professional Ski Patrol we are required to practice our rescue skills regularly. It was the combination of proper equipment, training, and practice that made this rescue a success. I wonder how many of the people who choose to ignore our area boundaries would have been so fortunate.

ADDITIONAL NOTES:

The slide was classified as SS AS 1 0 1.5 B T –even though this is a pretty good slide for a slope this size, it's a size 1 due to short vertical drop.

Communication with the scene was regained at 11:14 am with the report that the victim had been recovered and they were checking his condition.

It is worth reporting the radio problem, many radios are very easy to change channels inadvertently, and it brings up issues of preplanning what to do in that type of circumstance, or similarly, a continuously keyed mike interrupting normal communications.

Bram wound up on a ski testing team without a radio. In a perfect world this shouldn't happen.

Information about the larger slides encountered at this elevation had been relayed and received, and more cautious travel was appropriate.

The small size of the slope may have contributed to the decision to cross the slope this low.

Peter was buried in a semi- seated position, with his head approximately 4.5' deep

He was uncovered to air in 6 minutes, and it took about another 7 minutes to completely free him

He returned to work immediately that day with no ill effects.

A fracture line profile was not done. Subsequent pits indicated that this and other slides that morning were triggered by weak layer collapse, breaking the tensile strength of the snow slab and a thin, brittle crust below the slab layer. The weak layer was identified as surface hoar buried by low density snowfall. Sliding surface was a buried freezing rain crust of approximately 3 cm. This relatively low-angle slope had no compressive support below, due to the drop off.

Later that night a natural cycle followed at these elevations, and similar aspects throughout the valley.

That area, previously unnamed, is now known as "Watch your Peter".

Ancillary Avalanche Information—

provided by Mark Moore, NWAC

The back country avalanche forecast issued by the Northwest Weather and Avalanche Center for the Cascades at the time of the incident is given below and indicated a considerable avalanche danger in the nearby back country at the elevation and exposure of the incident with avalanches probable, mostly running on buried surface hoar.

BACKCOUNTRY AVALANCHE FORECAST FOR THE OLYMPICS, WASHINGTON CASCADES AND MT HOOD AREA

These forecasts apply to back country avalanche terrain below 7000 feet. They do not apply to highways or operating ski areas.

9 AM PST Tuesday 30 January 2001

ZONE AVALANCHE FORECASTS.....

OLYMPICS. . . WASHINGTON CASCADES. . .

Avalanche danger considerable above 3-4000 feet Tuesday and moderate below. Avalanche danger slightly decreasing Wednesday, becoming considerable above 4-5000 feet and moderate below.

MT HOOD AREA. . .

Avalanche danger considerable above 5000 feet Tuesday and moderate below. Avalanche danger slightly decreasing Wednesday, becoming considerable above 6000 feet and moderate below.

SNOWPACK ANALYSIS....

About 8-12 inches of snow has fallen Monday and early Tuesday in the Olympics and near and west of the Cascade crest. An exception is Mt Baker with about 20 inches of new snow. This snow was generally accompanied by change from southeast or east winds and cooler temperatures to west winds and warmer temperatures. This allowed higher density snow to accumulate over lower density snow on many slopes. These unstable profiles should lead to soft slab layers and make human triggered avalanches likely on some steeper slopes. This is most likely on north to east aspects at higher elevations. Surface hoar frost also developed on sheltered slopes and at lower elevations over the weekend. This was buried by the new snow and may poorly support upper surface layers on more varied aspects. Unfortunately these conditions have apparently led to an avalanche fatality near Twin Lakes near Lake Wenatchee on Monday afternoon, where 2 snowshoers triggered a 1 foot soft slab avalanche at about 3200 feet. Soft slab layers that could be triggered by skiers were also reported from Stevens Pass and Mt Hood Meadows on Monday. In the Olympics and west of the Cascade crest, the snow pack below crusts that formed in mid January is mostly stable. But east of the Cascade crest underlying snow layers have been weakened by cooler temperatures, and may not be stable if loaded by significant new snowfall.

Tuesday.....

Continued west winds and renewed light to moderate snow is expected in the Olympics and north and central Cascades Tuesday,

with light snow in the south Cascades. New areas of soft slab layers are likely to form on some steep slopes. This should continue to be most likely on north to east aspects at higher elevations. Previous soft slab layers should partly stabilize. Buried hoar frost may also maintain instability on more varied aspects at lower elevations. Back country travelers should continue to use caution near avalanche terrain.

Wednesday . . .

Lighter winds and lighter snowfall should allow new soft slab layers to settle and partly stabilize on Wednesday. But underlying weaker snow or buried hoar frost should also maintain instability of soft slab layers on some steep slopes. This should continue to most likely on north to east aspects at higher elevations and varied steep aspects at lower elevations. Back country travelers should continue to periodically evaluate snow stability on Wednesday. Increasing winds and snow in the north Cascades may bring an increase in avalanche danger in that area Wednesday night.

Backcountry travelers should be aware that elevation and geographic distinctions are approximate and a transition zone between dangers exists. Remember there are avalanche safe areas in the mountains during all levels of avalanche danger. Contact local authorities in your area of interest for further information.

NWAC Mountain Weather Forecasts and mountain weather data are also available by visiting our Web site at www.nwac.noaa.gov.

Ferber/Forest Service Northwest Weather and Avalanche Center