Crystal Mountain—Kempers Avalanche Incident

Crystal Mountain, WA

February 3, 2001

Summary—One professional ski patroller caught, swept through trees and partially buried, minor injuries

Slide details—

Date: 2/3/01; Time: ~1230 PST

NW exposure, 6400 ft, SS-AS-2-O-F

Vertical fall ~4-500 ft, Slab size 120-150 ft wide by 2 ft deep

Slide occurred in normally uncontrolled area on back side of ski area within Mt Rainier National Park.

Summary of snowpack layering: Recent wind slab slid on old faceted snow over a crust formed about three weeks prior to the accident

The following first hand report was provided by the victim, Brent Okita, Assistant Professional Patrol Director, Crystal Mountain Resort

Narrative:

On the afternoon of Saturday, Feb. 3, 2001, Chet Mowbray and I went to an area called Kempers to investigate an isolated skier released avalanche that occurred the day before. Kempers lies in Mount Rainier National Park, adjacent to the ski area, and has long been a popular run to ski owing to its easy access, just off the top of the High Campbell chair (6). An easy return to the Crystal Mountain is accomplished by a simple traverse about 500' below the boundary rope line marking Crystal's borders. The National Park and Crystal Mountain maintains an open boundary policy, allowing people to access the Park from Crystal.

The slide that we went to investigate was an isolated pocket 50' wide, 1' deep. A shovel shear test done in part of the crown indicated a moderate shear. In surveying the remaining terrain we focused on a part of Kempers a few hundred feet lower and on the South (left) flank, informally known as Ken's Face. Much of Kempers had been skied that day – little untracked snow remained. However, Ken's Face lies far enough on the periphery and downhill that this area had not been skied. A pocket of suspected wind slab was evident there, on the lee of the ridge on a northwest aspect. Winds had been from the southeast that morning.

Before we traversed back to the ski area, Chet made the first ski pass high on the slab before traversing off to the side. My first ski through focused on the snow lower in the pocket and near the ridge. It produced nothing. My second pass traversed back across the slope, away from the ridge and towards the right side. Midway through this pass the slab fractured about 20' above me.

In ski pole arrest position I had difficulty generating additional momentum to move off the slab in the moments before it disintegrated underneath me. I then tried to slow myself by driving my

poles in, but could not gain a purchase through the depth of the snow around me. As I gained speed, my next thought was to change my trajectory to avoid a tree. As my ski tips glanced off that tree I became engulfed in the slide. Bouncing over some smaller trees my skis came off and I could feel the bed surface underneath me, allowing me to try to dig into something.

I came to rest 300-400' below Ken's Face, having wrapped around two large trees. I stopped with my legs somewhat buried and my upper body above the surface. I called to my partner, Chet, to let him know that I was OK, and radioed that the avalanche emergency Chet broadcast when I was caught, was off.

All lost equipment was found, and injuries were limited to bruising and swelling of a leg that impacted a tree, and a grade 1 sprain of my MCL in the other knee.

The avalanche was 120-150' wide with an average crown height of 2 ft. The run out distance was 400-500', starting at an elevation of about 6400'. The slab consisted mostly of new snow from the previous week, overlaying facets from a January crust of the 18th and 19th. Small amounts of new snow had squared up over the next 8 days during mostly high pressure. Weak crust failure was easy at around 78 cm in the snowpack.

Photo of Kempers area provided by Crystal Mountain Ski Patrol—

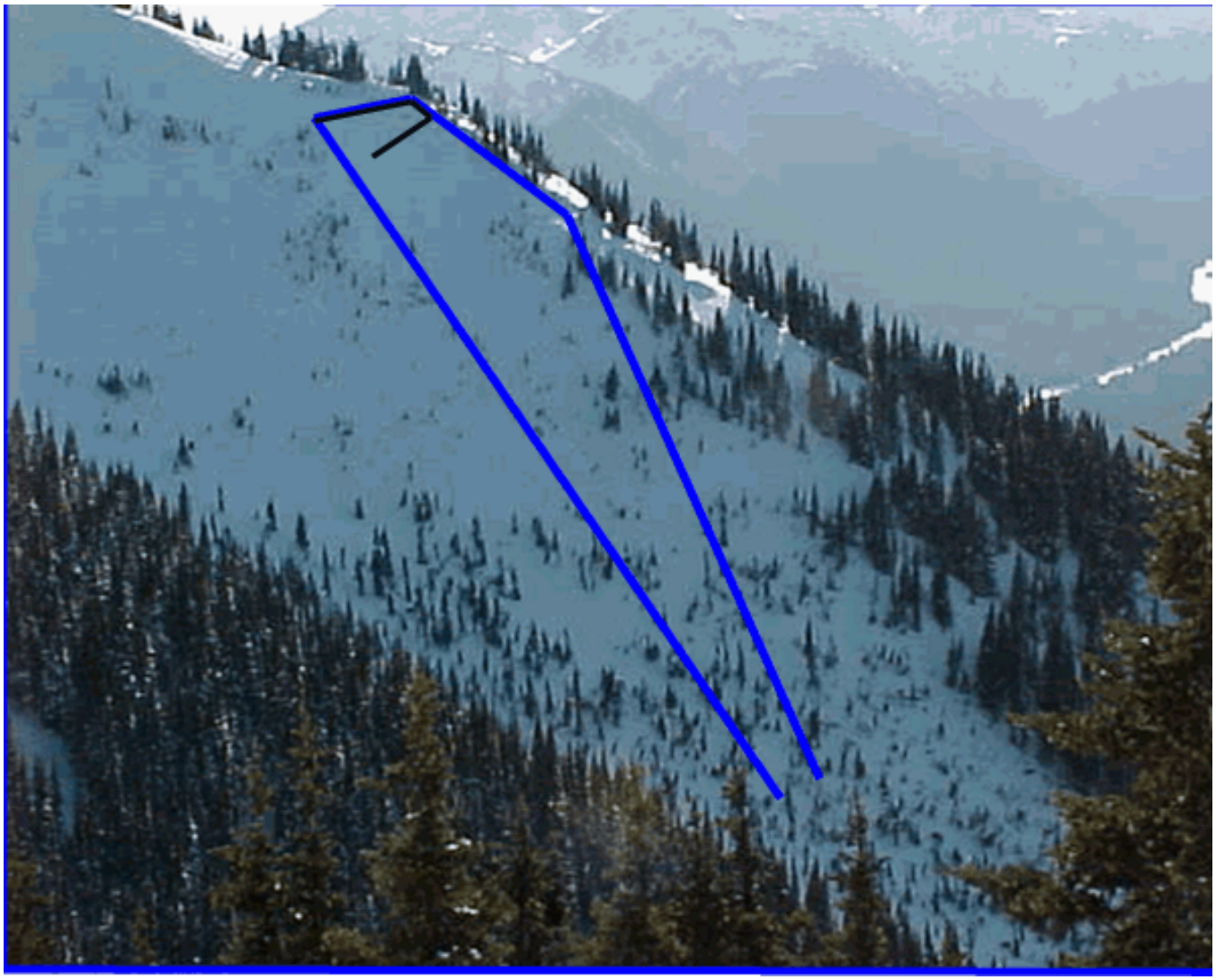

Figure 1. The blue lines indicate the approximate path and dimensions of the avalanche while the black lines near the crown indicate the approximate ski passes for the slope cuts.

Ancillary Avalanche and Weather Information—

Provided by Mark Moore, Northwest Weather and Avalanche Center

The site of the accident—Kempers, is in Mt Rainier National Park and not controlled; therefore the conditions probably approximate that of the back country. In the forecast issued on the morning of the accident, February 3, 2001, the danger at that elevation was termed considerable, and winds that had been from the south and southeast had recently shifted to the south-southwest. Hence a variety of slopes ranging from northwest to north and northeast to east may have experienced recent loading.. Also, several layers of buried surface hoar or older faceted snow existed beneath the recently deposited and slowly settling wind slab.

Related Back Country Avalanche Forecast

ZCZC SEASABSEA

TTAA00 KSEA DDHHMM

WAZ012-017-018-019-025-042-ORZ011-041700-

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NORTHWEST WEATHER AND AVALANCHE CENTER

NWAC Program administered by USDA-Forest Service with cooperative funding and support from Washington State Department of Transportation, National Weather Service, National Park Service, Washington State Parks and Recreation Commission, Pacific Northwest Ski Area Association and other private organizations

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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.

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9 AM PST Saturday 3 February 2001

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ZONE AVALANCHE FORECASTS.....

OLYMPICS. . .WASHINGTON CASCADES. . .

. . .AVALANCHE WARNING FOR SUNDAY. . .

Considerable avalanche danger above 4000 feet north and 5000 feet south Saturday, with a moderate danger below. Avalanche danger increasing Sunday, becoming high above 4000 feet north and 5000 feet south, with a considerable danger below.

MT HOOD AREA. . .

. . .AVALANCHE WARNING FOR SUNDAY. . .

Local considerable avalanche danger above 6000 feet Saturday, with a moderate danger below. Avalanche danger increasing Sunday, becoming high above 5-6000 feet, with a considerable danger below.

SNOWPACK ANALYSIS....

An initial storm cycle was seen early last week with about 1-2 feet of snowfall seen at most sites. Winds generally shifted from lighter southeast and east to stronger southwest and west, with temperature rises during the snowfall. This helped build a lot of wind slab with higher density snow over lower density layers. This helped cause numerous human triggered 6 inch to 2 foot avalanches, with an unfortunate fatality in a small soft slab avalanche in the Lake Wenatchee area. Weak layers were apparently provided by buried hoar frost from last weekend and initial lower density snow. Bed surfaces were likely provided by crusts from mid January. A second storm cycle was seen the past couple days with snowfall amounts ranging from about 4 inches at Mt Hood Meadows to about 18 inches at Mt Baker. Wind shifts but less temperature change and perhaps less well defined weak layers or bed surfaces helped cause fewer human triggered avalanches up to about 6 inches. Quite a bit of snow settlement has also been seen the past 24 hours, which should help to partly stabilize snow on some slopes. But areas of unstable snow may also linger on some steeper slopes. This should be most likely on steep open north to east facing slopes at higher elevations. Less snow has been seen lately east of the Cascade crest, and lingering wind slab in that area should be limited to isolated areas near ridge crests, with some scoured slopes. Back country travelers east of the crest should also check for weak snow deeper in the snow pack or near the ground from earlier in the season, which may poorly support upper slab layers.

Saturday.....

Lighter winds and light snow showers should help prevent the build up of new unstable snow on Saturday. Wind slab from storm cycles early in the week and the past couple days should continue to settle and partly stabilize. Backcountry travelers should continue to use caution on steep open slopes, especially on north to east aspects at higher elevations. Periodic snow stability evaluation is recommended.

Sunday.....

Increasing strong southwest winds at higher elevations with moderate to heavy snow and then wet snow

or rain is expected to develop Sunday with rising snow levels. A change from east to west winds should be seen in the Cascade passes. This should generally build higher density layers over initial lower density snow. New unstable wind slab should be most likely on open north to east facing slopes at higher elevations, and on more varied aspects near passes. Natural and human triggered avalanches should be likely. Travel on or near steep open slopes is not recommended Sunday.

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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