

## Lenin Avalanche Accident

Big Sky Resort

Big Sky Montana U.S.A.

12-13-09

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### Overview:

An avalanche occurred in the Lenin ski run on Lone Mountain at the Big Sky Ski Resort in southwest Montana at approximately 1200 hrs on 12-13-09. The ski run was open at the time of the avalanche. The avalanche was presumed to be triggered by one of the two people caught in the slide however there were 10-20 people in the greater Lenin region. The slide was 160 ft wide (all figures are estimates). The top of the crown was 2.5 feet at its maximum and tapered to 1 ft, 30 ft laterally from the maximum depth. At that point the crown descended downhill and flanked out to its maximum width of 160 ft and a crown depth of ½ ft. The avalanche ran 1200 ft vertical and released in a start zone slope angle of 39-42 deg. at an elevation of 10,800 ft. One skier was caught and carried on the slab for 350 ft vertical before self arresting with a ski pole. The other skier further in the path when it released was unable to get off the slab and carried for 1100 ft, buried with his head and shoulders on the surface, face down. Neither of the two people involved sustained any injury. The debris field was 60-100 ft wide and 350 ft long with an average depth at 3 ft and maximum depth of 6 ft. The avalanche is classified as a HS-AS-R2-D2.5. The immediate area had received 14 different 2-4 lb hand deployed explosives and 5 avalauncher rounds by 5 different hazard reduction routes as well as two separate avalauncher operations. 11 of the shots were deployed by 4 routes in the previous 5 days. The slide path had avalanched on 2 previous occasions.

### Weather:

A trace of snow (.3 inches) was recorded on the 9<sup>th</sup>, 10<sup>th</sup>, 12<sup>th</sup>, and morning of the 13<sup>th</sup> at the Big Sky Lobo Weather Station (8900 ft) for a total of 1.3 inches of snow in 4 days. Minimum temperatures at this site on the 10<sup>th</sup> were -13F, 11<sup>th</sup> -2F, 12<sup>th</sup> -2F, and 13<sup>th</sup> 14F. Max daily temperatures were 10<sup>th</sup> 0F, 11<sup>th</sup> 10F, 12<sup>th</sup> 18F, and 13<sup>th</sup> 20F. Ridge top winds (9,750 ft) were recorded as westerly in the teens to 20's (mph) on the 10<sup>th</sup> and 11<sup>th</sup> and southwesterly in the 20's to 30's on the 12<sup>th</sup> and 13<sup>th</sup>.

### Snowpack:

The slab consisted of a pencil hard wind deposited layer and released on several different weak layers consisting of .5-1.5mm facets. The bed surface was made up of several different layers from knife to 1 finger hardness and the avalanche gauged and rode up on multiple layers of varying depths throughout the run-out zone entraining more snow as it descended.

## Search and Rescue:

Six members of the Big Sky Ski Patrol (BSSP) were in the Lenin region and were readying their rescue equipment as the debris settled. Another 17 Big Sky Ski Patrollers responded to the incident as well as 8 other mountain operation employees and 20 skilled and equipped public volunteers. The individual who was caught and carried 350 ft was immediately attended to and assessed for injury by BSSP. The individual who was carried 1100 ft was located by an avalanche transceiver search and assessed by BSSP within 2 minutes of the debris settling. The 50 individuals performed multiple beacon searches, hasty scuff searches, Recco searches, spot probing, and a probe line. There were two Big Sky Avalanche Rescue Dog teams which covered the debris a total of 6 times. Upon interviewing the many witnesses a reliable assessment that there were no other people involved in the avalanche was determined. Due to the reliable witness reports and a thorough search, the scene was clear of all personnel by 1530 hrs.