

Comments of George Kenzy  
before the  
Belt Air Utilization Technical Study Panel  
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I appreciate the opportunity to stand before this distinguished panel and comment about the use of belt air. My name is George Kenzy. I began my underground mining career in the Coeur d'Alene Mining District at the Bunker Hill Mine in the early 1960's and remain an underground miner today. I have a Master of Science degree in Mining Engineering from Penn State and have been employed at the Skyline Mine since 1980 except for a brief ill-considered attempt at early retirement. For those not familiar with Skyline, it is an underground coal mine located near Scofield, Utah. My underground mining experience includes both hardrock and coal mining and mining engineering in the United States and a number of foreign countries. My experience at Skyline has included work assignments as a maintenance foreman, mine electrical foreman, production foreman, outby foreman and mining engineer.

My comments today reflect our 20-year experience with longwall gateroad development from the perspective of safety relating to roof and rib control, ventilation and AMS systems. Skyline Mine is located in the Wasatch Plateau at an elevation of approximately 8,600 feet and can simply be described as a multi-seam reserve made up of four mineable seams varying in thickness from inches to in excess of 20-feet with overburden depths from as few as 600 feet to well in excess of 2,000 feet. The originally flat-lying strata have been folded several times throughout geologic time and, with each tectonic event, severely faulted and fractured. During one episode, some of the pre-existing faults and fractures were intruded or injected with nearly vertical walls of molten igneous rock which vary in thickness from inches to hundreds of feet. Mother nature blessed us in one sense with extremely low methane liberation rates however she, in my estimation, cursed us with extraordinarily large amounts of ancient water on the order of 7,500 gallons per minute which flow into our workings from the below-lying aquifers through fault-zones. To put it simply, Skyline is a geologically complex property which has and shall continue to provide mine design and operational challenges not typically seen in underground coal mines.

In brief, what I'd like to leave you with today is our history and experience with having mined both two and three-entry gateroads, our experience with the use of belt air in both the mains and gateroads and our longstanding experience with and confidence in the use of AMS systems.

In 1980 we began the design and permitting of the Skyline with an incomplete understanding of what we would experience in our goal of safely and cost effectively mining coal. We intended from the outset to employ longwall mining to attain our design production rate of 5.5 million tons per year. Historically we

have developed a total of 41 longwall panels in three of the four mineable seams. The first 36 panels were developed using a three-entry gateroad design with a variety of pillar design layouts; i.e. two stiff pillars in gateroads where there was either a barrier between panels or no adjacent mining was planned, one yield and one stiff pillar in both the middle and lower seams, and two yield pillars in the uppermost seam mined. The success of these gateroad designs can be judged, through my eyes, unfavorably, taking into account the 54 total MSHA reportable roof falls and one fatality associated with three-entry gateroads in combination with our complex geology. Having been a production foreman in three-entry gateroad development sections and experienced the day to day challenges of adequately supporting the roof and ribs in our seams, I can attest to the less than desired conditions afforded by three-entry gates. The immediate roof in cuts as short as 10 or 15-ft would frequently fall either during or immediately after completing the cut and well before the roof bolter could access the cut. Subsequent roof support rehabilitation was an on-going, potentially hazardous and high-cost process in spite of every attempt and many experiments with alternatives to the full-column resin bolt. The introduction of cable bolts improved the long-term stability of gateroad entries and crosscuts but did not totally eliminate the need for subsequent roof support rehabilitation and did nothing to lessen the tendency of the immediate roof to fall after completing the cut and prior to being able to bolt it.

With the change in Skyline's ownership in 1998 there came a rekindled interest in two-entry gateroad mining and recognition from other mines, that two-entry gateroads offered a significant potential improvement in safety and stability during development and retreat longwall mining. Intuitively, with one-third fewer intersections in two entry gateroads, the potential for intersection failures is significantly reduced during section advance and retreat. Similarly, with Skyline's depths of overburden, high horizontal stress and moderately to intensely fractured coal, the potential exposure to rib falls is significantly reduced. Consequently, Skyline applied for and in July 2001, was granted a 101C petition for modification enabling two-entry development and longwall mining.

We began two-entry gateroad development in January 2002 and have, since then developed five and mined-out four two-entry longwall panels. There was, I should add, a six somewhat atypical longwall panel developed with a two-entry tailgate and three-entry headgate because the longwall panel utilized sub-mains entries for the headgate-side entries.

Each of the two-entry gateroads developed since 2002 have had no less severe geologic challenges than the preceding 36 longwall panels. In several regards, there were perhaps greater challenges due to in-panel faults with wide gouge zones of crushed and therefore incompetent rock, igneous dikes, and very high water inflows. In spite of the challenges it is apparent that the narrower gateroad development has provided improved stress distribution and consequently much safer conditions both during development and subsequent retreat longwall

mining. My statement is based upon the fact that there have been no MSHA reportable roof falls in the two-entry sections and very little need for costly rehabilitative roof support. Extended cuts of up to 40-feet are mineable and safe with infrequent falls of either roof coal or rock except when unusual conditions such as intense fracturing, igneous dikes, rock splits and spars or unexpected faults are encountered. The improved overall conditions in the two entry gateroads apart from continual rib sloughage is not readily apparent without the benefit of having seen and experienced our three-entry gateroads. Indirect support of my assertion that two-entry development is safer can be gained from our outstanding safety history which include the Sentinels of Safety award and far better than regional and national MSHA safety statistics.

Turning now to ventilation and the issues of respirable dust exposure when belt air is used at the face and which has been a topic of discussion during earlier meetings of this committee. Skyline applied for and was granted a 101C petition for modification enabling the use of belt air with an injection point in the mains entries in May 2001 which preceded our two-entry petition by several months. This application of belt air use in the face affected six or more mainline belts and several operational section belts. The historical MSHA dust sampling data would have me believe that there were no appreciable increases in respirable dust concentrations in either the affected beltlines or the face areas. In this regard Skyline has always been very proactive in health and safety matters; in this case by minimizing respirable dust exposure by requiring that all longwall mining personnel wear an Airstream helmet on the face. One operational issue relating to dusting beltlines was rock dust reaching the working faces. This unacceptable situation was addressed by rescheduling beltline dusting to the idle shifts.

Since resuming mining operations in 2005, Skyline has utilized belt air in the face as provided for in our two-entry petition. There have been a total of five Skyline and five inspector-collected beltline designated area samples taken in by the longwall loading point as required by our petition. The results average 0.48 mg/m<sup>3</sup> for the mine samples and 0.39 mg/m<sup>3</sup> for the MSHA samples and none of the individual samples exceeded the 1 mg petition standard. Therefore, in our experience dust from the belt has not been an issue though it should be noted that we use flooded-bed dust scrubbers at the stageloader crusher and belt loading points to proactively control potential dust sources in these locations.

The last area that I'd like to touch upon today is that of atmospheric monitoring systems or AMS which are required by 30CFR 75.350 where belt air is used at the face and two-entry petitions. Skyline began using an automated mine monitoring system in the late 1980's when we installed a Mundix system during during the time I was the mine electrical foreman. The Mundix system is not an AMS system as defined by 75.301 because it was primarily used to monitor point-type heat sensors and conveyor belt drives along with the associated electrical installations. There were a few mine atmosphere monitoring instruments installed, primarily in support of our mine's intake air-heaters. The

Mundix system was replaced by a Conspec Senturion system in 1995 and approximately six years prior to implementing either of our belt air petitions. The Conspec system allowed us to replace the point-type heat sensors with carbon monoxide detectors in beltlines and to install carbon monoxide sensors in many remote locations and installations such as power centers and pump rooms. Our Conspec system has undergone several upgrades out our desire to improve the mine atmosphere monitoring function and overall system performance. The current generation of our AMS system affords us confidence in our ability to monitor the mine atmosphere throughout the active and inactive mine workings and react quickly to any upset conditions at any location underground. The use of sensor packages called diesel discriminators provides the ability to differentiate between carbon monoxide sources, e.g. diesel exhaust, cutting and welding or fire-derived thereby minimizing false alarms. We know that the Conspec system works and works well. We furthermore have sufficient experience with AMS systems to realize the we are a safer mine because for example, the AMS enabled us to detect and quickly respond to a transformer heating in an inactive part of the mine which had it not been detected by an AMS sensor, might have resulted in a serious mine fire.

Another significant benefit of our two-entry mining development is the added fire-fighting capability on the intake aircourse which duplicates the fire hydrant and hose requirements in the beltline. The intake and beltline fire fighting installations in combination with the AMS sensors and heat-activated water sprinklers at belt drives and transfers make us a much safer mine and mitigate any potential risk of having adjacent primary and secondary escapeways. In addition, the special measures required to protect diesel-powered equipment, limiting their numbers in the section, and not storing diesel fuel on the section significantly reduces the fire potential in two-entry sections.

I'd like to close with several very brief comments and a make a request of this committee.

First, in my opinion and on the basis of our experience at Skyline I agree with and would like to quote Bill Knepp who, at the January 9<sup>th</sup> 2007 meeting of this committee is on the record as having said in reference to any fixes needed to the existing belt air rule, "I think it's a pretty damn good rule and is pretty comprehensive." (Page 69, Lines 23-24)

Speaking specifically to the matter of two versus three or more entry gateroads, I feel that Skyline's history provides a single but outstanding example of how much safer two-entry gateroad developments are, first from the ground control standpoint and secondly from the added safety-related terms and conditions of our petition.

Finally I'd like to make a request of this committee. The record of both the January and March meetings of this committee included comments to the effect

that the human nose detects products of combustion quicker and at lower concentrations than the best of the mine atmosphere sensors, in fact it was pointed out that one advantage of using belt air at the face is the quicker detection of an outby fire by the miners inby. Therefore, in the interests of making any AMS-equipped mine safer, and especially those using belt air at the face, please consider recommending that NIOSH or another research institution dedicate sufficient resources to develop an electronic instrument comparable to the human nose in selectivity and sensitivity.

Thank you for your time and patience.