COMMENTS

BY

Tom McNider

On behalf of

Jim Walter Resources, Inc
And
The National Mining Association

FOR

TECHNICAL STUDY PANEL ON THE UTILIZATION OF BELT AIR AND THE COMPOSITION AND FIRE RETARDANT PROPERTIES OF BELT MATERIALS IN UNDERGROUND COAL MINING

Jim Walter Resources, Inc. (JWR) and the National Mining Association (NMA) would like to thank the Panel for the opportunity to provide comments concerning the use of the belt air course to transport air to the working face and the associated belt that is used in conjunction with belt air. These comments reflect the views of the members of NMA and my experience as an employee of JWR. These comments are limited to the composition and fire retardant properties in use only in conveyor belt entries where the air is used to ventilate the working section. We encourage you as you consider these issues to remain cognizant of the distinct differences that exist between conveyor belts used is this application as opposed to non-belt air applications.

JWR received approval for its first 101c Petition for Modification of a mandatory safety standard 30CFR 75.326 in 1979 at its No. 4 Mine. We have been using belt air successfully at all of our coal mines since that time. Contrary to the opinion of others, the industry believes that belt air utilization is safe, and is, in fact, much safer than not utilizing belt air. Numerous studies and the safe use of this form of ventilation in mines throughout our country has shown that belt air ventilation provides for positive ventilation on the belt, real time monitoring for contaminants, and better utilization of the air courses available for ventilation. Just like any other facet of mining, belt air must be used responsibly and the safety precautions required where it is used must be adhered to. There has been a considerable amount of discussion in the press and among perceived experts about the Aracoma accident and how belt air was a contributor to the lack of escape for two miners. I encourage the panel to study the accident report issued by the State of West Virginia Office of Miner Health, Safety and Training report prior to coming to any conclusions as to the role belt air played in this tragic event. I think you will find that conditions totally unrelated to the use of belt air hindered the miner's escape.

Belt air has been studied many times each with a positive finding that belt air is in fact safe for use in the working face. The last such study was completed in 1991 by an advisory committee to the Secretary of Labor who concluded that ventilation of the working section using air coursed through the belt entry is safe provided certain protections are incorporated into its use. In 1996 MSHA initiated a regulatory process to again review the use of belt air and promulgate regulations as to its use in coal mines. Jim Walter individually and as a part of the NMA has been involved in each study by commenting on its use and offering our mines as sites to be examined. Should the panel be so inclined, we again offer our mines so that you can see, first-hand, the safety benefits we derive using this form of ventilation.

With your indulgence I will now turn to my experience at JWR in the use of belt air and comments on the various types of belt material that we have used in our mines. These comments reflect our experience at JWR only.

JWR MINE WIDE MONITORING

INTRODUCTION

In 1979 JWR was granted its first petition to use belt air to ventilate the working sections. These petitions required sensitive carbon monoxide sensors to be installed at intervals along the belt (and at other locations) linked to a monitoring system that would alert the miners working at the face in the event of carbon monoxide levels rising above designated limits. Early computer systems for accomplishing this were quickly loaded to levels that caused problems for the systems, resulting in numerous false alarms and high maintenance costs to keep them operating. Because of this, in 1989 JWR decided to design its own Mine Wide Monitoring System. The system was designed to take advantage of existing carbon monoxide sensors available on the market at the time and through co-operative efforts with American Mine Research and Conspec, "Intelligent carbon monoxide sensors" were designed. These sensors were designed with direct communication to the Jim Walter mine wide monitoring system (to eliminate unnecessary interface cards) and incorporated many new features such as auto-calibrate and self testing. The sensors continue to improve and offer very accurate measurement of carbon monoxide even in areas where air velocity is high. Other devices were designed to allow communication to belt controllers, vacuum breakers, power centers, etc. and barriers were developed and approved to allow monitoring in areas of the mine requiring permissible equipment. The system was installed at all of the Jim Walter's mines in 1990 and 1991.

OPERATION

The original system used three personal computers to perform the various functions of monitoring the sensors (MCP computer #1), distributing real-time information (Editor computer #2) and viewing real-time or historical data (Graphics computer #3). Several design improvements have been made to the system in the seventeen plus years of operation and yet many of the original components underground are still in service (some are still in their original location without loss of service). One major improvement in the hardware underground, implemented in 1995 was the design of a totally fiber optic trunk system. This provides noise immunity and isolation that allowed more locations to be monitored and much more reliable communication under all conditions. The system has a proven track record and many of the ideas designed into the JWR system were adopted as standards by other manufacturers of mine wide monitoring systems.

The current system takes advantage of the latest personal computer hardware and software to achieve some pretty impressive performance benchmarks. The system uses a SQL database for storing the information logged by the system and uses two personnel computers operating redundantly to maintain as much uptime as possible in this difficult environment. It is capable of monitoring 32,000 points (one point is equal to a status to be read from a location underground or on the surface, such as the CO PPM value from #23 carbon monoxide sensor or the state of remote switch 2 on West B Belt). Each point may be configured in the system as to how often its state is read (scanned) and with current system loading of approximately 2500 points the system reads in all values every 1.5 seconds! These fast scan times are important to deliver as close as possible to real-time information to the control room operator. We have learned through our experience of monitoring everything underground that many times information obtained from equipment can be just as important as the carbon monoxide sensor readings when the operator needs to make a decision during an event. As a matter of fact, the use of mine wide monitoring systems offers the opportunity to operators to monitor many different functions of their operation which in turn enhance the safety of their mines.

SYSTEM STAFFING

The system would be ineffective without proper staffing. At Jim Walter we have trained Control Room Operators who watch the system 24 hours a day 7 days a week. This person is also the "Responsible Party" as required by MSHA to track people's movement in the mine and to remove people in case of an emergency. The monitoring systems can also be utilized as part of the automated tracking system once it is perfected as required by the Miner Act. The Control Room Operators are trained to respond to alarms generated by the system and in detecting conditions that may indicate possible problems before they have a chance to escalate into an alarm condition. The system allows for the setting of five levels of alerts to the operator and these lower level alerts are set below regulated values in critical areas so that investigation can begin more quickly. The system also provides tools such as graphical representations of sensors or equipment to help them make quick and accurate decisions. They also have the ability in some cases to control devices underground such as stopping the conveyors or removing power from a section.

Staffing also includes at least one carbon monoxide technician for each shift who has the responsibility of keeping the system calibrated, advanced and in good operating condition. They are trained in the operation of the sensors and other hardware, in calibration and in the requirements of the law for installation. I would note that the systems we have installed are not unique to JWR. While systems are tailored to the environment within which they operate, this practice and the system hardware and software are commonplace among companies that use belt air to ventilate the working section.

MONITORING SUMMARY

Because many operators use belt air and many petitions were granted, in 1996 regulations were introduced to eliminate the petition process for belt air and apply a more unified standard to the industry. Most of the requirements that were imposed by the final regulations adopted by MSHA had been in practice at Jim Walter for ten years or more. Through the years we have monitored many different special conditions, used many special sensors and the system has been scrutinized by many different parties and under various sets of circumstances and yet is still recognized industry wide as the leader in monitoring systems.

FIRE RETARDANT BELT MATERIALS

Because of Jim Walter's commitment to safety and the utilization of belt air we decided to study the use of a belt that was more fire retardant than the commonly accepted 2-G belt. Following the Wilberg Mine Fire in December, 1984 where rubber conveyor belting, which was approved under 2-G, was suspected of either being the cause or a contributing factor, it was decided that Jim Walter Resources Mining Division should re-evaluate its conveyor belt specifications in regard to fire resistance characteristics.

Based on this study it was concluded that Jim Walter mining conditions required more stringent conveyor belt fire resistance characteristics than are acceptable to meet MSHA's Schedule 2-G requirements. Consideration was given to establishing testing criteria based on Jim Walters mine's unique conditions however, it was determined this was not necessary because: (1) established standards in other coal mining countries were broad enough to cover our conditions; and (2) new testing criteria would be difficult to insure compliance with and could be prohibitively expensive. Therefore, the conveyor belt fire resistance regulations in other countries were studied for applicability to Jim Walter's mine conditions.

In reviewing the conveyor belt fire resistance characteristics required by other countries, it was decided that none, in their entirety, met the requirements for our mines conditions. However, each had some particular tests which were applicable to our conditions. Therefore, it was recommended that all future conveyor belt purchases meet the following recognized fire resistance tests.

1. MSHA Schedule 2-G, EM & R, or NCB 158 Flame Test
2. EM & R or NCB 158 Drum Friction Test
3. NCB 158 Propane Burner Test
4. EM & R or NCB 158 Electrical Resistance Test

Jim Walter started using a Poly Vinyl Chloride (PVC) type belt in late 1983 and this continued until 2001.After the Proposed Belt Specifications were released in March 1989 by what was then the Bureau of Mines Pittsburgh Research Center for MSHA, Jim Walter started buying what we referred to as new compliance rubber that met these specifications. We purchased and used this belt from approximately 1991 until 1997 (see attached belt purchase sheet for No. 7 Mine). Although both of these belts exceeded the 2 – G requirements for fire resistance the operating characteristics of both type belts created operational and safety issues that lead us to return to 2 – G belt in 2001.

OPERATION EVALUATION REPORT

PVC BELT MATERIALS
GEORGIA DUCT

- This belt was extremely tough when new but aged rapidly. The older it got the harder and more brittle it became. The surface would crack and the edge cover would break off.
- It handles coal well, but rock which we mine a lot of pitted the surface which creates a cleaning nightmare. Wet coal slurry would be deposited along the conveyor at every idler, drive and take-up pulley. This in every case is viewed as a hazardous condition and required large amounts of man hours to control. This problem resulted in numerous 75.400 violations for accumulations of coal dust.
- The belt had little longevity and became extremely hard and brittle with age.
- When spliced with mechanical splices this belt faired well using nail type (Flexco) splices, but would not hold well with the staple type (clipper) splices. The close proximity in which the stable punched through the material caused a zipper like tearing affect directly behind the splice. This failure would occur without warning.
- The belt became so hard and brittle that cutting it for splicing and repair purposes became a major task. Mechanical belt cutting tools were bad to break off the blades while cutting the belt for splicing. Utility knives (the most commonly used cutting tool) were very dangerous because of the extreme amount of pressure that had to be applied to this hardened belt.

- After the belt was run for a while and the hardening took place, rolling the belt up off of one installation and re-installing it onto another installation breaks and splits would occur in the fabric.
- The point where the troughing idler meets the flat idler, in a top idler frame, the pressure of material weight at this point would create splits that would run length ways down the belt. This caused the belt to spill material at a rate too intense to allow you to continue to run it. Large amounts of downtime were incurred while the split portion of the belt was cut out and removed. If a large rock went through the split and hung in a troughing frame, hundreds of feet of belt material could be ripped before the problem was found and corrected.
- Once the edge cover peeled away the material underneath became a major problem. Strings peeled from the inside of the belt and wrapped themselves around every idler in the entire belt system. Large amounts of production time were lost due to having to shut the belt down to de-string the idlers.

FENNER'S FENNAPLAST

- First impression of this belt was good but we quickly learned that longevity became an issue with this belt also.
- This material didn't harden like Georgia Duck but it did have most of the same problems. These problems were splice failure, long splits at the troughing point, pitted covers, peeling edge caps, strings, etc.
- This belt was much worse than Georgia Duck when it came to length ways splitting, but far stronger in retaining mechanical fasteners.
- One feature common to both belts, but not mentioned above, is cover losses. This created problems with mechanical fasteners because there wasn't enough cover to recess the splice allowing scrapers and wipers to grab the fastener edge and tear them from the belt.
- None of the PVC belt materials we used allow the use of poly-based idlers. This combination creates serious tracking issues and the belt is very abrasive to metal idlers. Roller wear was close to double that of rubber belt.
- Another problem associated with both types of PVC belt was that when the belt would slip in the drive a white smoke could be driven off that was irritating at a very low part per million level to a person's nose, throat, and lungs but would not be detected by the carbon monoxide detection system. It is believed that when PVC belt is heated to low temperature levels that hydrogen chloride is the gas that is driven off.

GEORGIA DUCK RUBBER

- This was a very good belt with strong, thick covers that wear very good. It handles vulcanized and mechanical splices well.

- It stands up well to the abuse that heavy materials subject it to. It can be cleaned with a variety of different scrapers without damage to the cover.
- The major problem with this type of belt is that the chemical make-up of the cover material allows it to retain heat for long periods of time. If this belt is allowed to run out of alignment for any length of time the shavings that peel off the belt will hold enough heat to create what is referred to as a hot spot. The floor material under the belt used to transfer coal will begin a combustion process and can spread through a large area of your belt entry and if undetected could even create a fire. Our carbon monoxide system detected many of these hot spots while using this type belt.

In sharing these observations and experiences Jim Walter is not trying to be negative concerning the use of a more fire resistant belt, but is attempting to point out the operational problems that only looking at one aspect (fire resistance) of the belt material can create. Operational problems, as stated above, ultimately lead to safety issues. As new specifications for belt material are developed, the developer of the specification must be cognizant that it does not create a multitude of other problems.

In closing let me again thank you for this opportunity to present these comments on behalf of JWR and the members of the NMA that utilize belt air to ventilate the working section. Our collective experience has demonstrated that this is a safe, effective means to ventilate underground coal mines and that the necessary precautions can be implemented to ensure that mine safety is not compromised by its use. As you consider the many facets of this issue we ask that you not view each factor in a vacuum. Rather, it is imperative that you consider the overall safety benefits derived from this ventilation practice which, history has proven, can be done safely and effectively for the benefit of miner safety.

Code	AFE #	Type	Brand	Wit	Description	Amount	Date
DC-22	8122	2G	Goodrich	42	440piw 4ply coalseal 3/16 x 1/16	16,000	Jan-83
DC-24	8147				CANCLED		
DC-28	8166	2G	Goodrich	54	550piw 5ply coalseal 3/16 x1/16	4,500	Oct-83
DC-37	8231	PVC	G.D.	42	Vinylock PVK-1010	12,000	Dec-83
DC-41	8250	PVC	G.D.	42	Vinylock PVK-750 green	24,000	Nov-84
DC-46	8295	PVC	G.D.	42	Vinylock PVK-750 green	20,000	Jan-85
DC-48	8326	PVC	G.D.	54	Vinylock PVK-1010	6,000	Jan-85
	8326	PVC	Dunlop	42	670piw	24,000	Apr-85
DC-50	8355	PVC	Dunlop	42	Vinyplast 3/32 x 3/64 MSHA 38-39	10,500	Aug-85
DC-71	8543	PVC	Fenner	54	800piw Fenaplast NCB 158	10,000	Aug-87
DC-81	8580	PVC	Fenner	48	650piw Fenaplast NCB 158	5,000	Jul-88
DC-86	8602	PVC	Fenner	54	800piw Fenaplast NCB 158	12,000	Jun-88
	8602	PVC	Fenner	60	800piw Nitrile cover 3x2mm	750	Jun-88
DC-87	8609	PVC	TBA	48	800piw Yarwell (Hager)	29,000	Aug-88
DC-94	8652	PVC	TBA	54	800piw Yarwell (Hager)	11,000	Aug-89
DC-97	8667	PVC	TBA	48	800piw Yarwell (Hager)	10,000	Aug-89
DC-103	8700	PVC	TBA	54	800piw Yarwell (Hager) 1 roll Scandura	9,500	Sep-89
DC-111	8737	PVC	TBA	54	800piw Yarwell (Hager)	5,000	Mar-90
	8737	PVC	TBA	60	Chloroprene covers	750	May-90
DC-144	8866	PVC	TBA	54	800piw Yarwell (Hager)	3,500	Feb-91
	8866	PVC	TBA	48	800piw Yarwell (Hager)	10,500	Feb-91
DC-152	8884	NCR	G.D.	42	600piw 3ply 3/16x3/32 (Perry)	10,200	Mar-91
DC-157	8901	PVC	TBA	48	800piw Yarwell (Hager)	14,500	Jun-91
DC-158	8906	NCR	G.D.	54	1000piw 4ply 3/16x3/32 (Perry)	11,500	Jul-91
DC-161							
DC-188	9013	NCR	G.D.	54	1000piw 4ply 3/16x3/32 (Perry)	14,000	Mar-92
DC-199	9053	PVC	TBA	48	800piw Yarwell (Hager)	3,000	Aug-92
	9053	NCR	G.D.	54	1000piw 4ply 3/16x3/32 (Perry)	2,500	Apr-93
DC-210	9097	PVC	TBA	48	800piw Yarwell (Hager)	11,000	Apr-93
DC-232	9197	PVC	Fenner	48	800piw Fenaplast	10,000	Feb-94
	9197	NCR	TBA	54	1000piw 4ply 3/16x3/32 Yarwell (Hager)	3,000	Feb-94
DC-248	9254	NCR	TBA	54	1000piw 4ply 3/16x3/32 Yarwell (Hager)	12,000	Aug-94
DC-262	9299	NCR	TBA	54	1000piw 4ply 3/16x3/32 Yarwell (Hager)	7,000	Aug-95
	9299	PVC	TBA	48	800piw Fenaplast	7,000	Aug-95
DC-292	9429	PVC	Fenner	48	800piw Fenaplast	10,000	Aug-95
DC-299	9456	PVC	Fenner	48	800piw Fenaplast	7,000	Jan-96
DC-315	9516	PVC	Fenner	48	800piw Fenaplast	17,000	Jul-96
DC-321	9541	NCR	central supply	54	1000piw 4ply	2,000	May-97
DC-332	9595	NCR	central supply	54	1000piw 4ply	2,400	Jun-97
DC-338	9620	NRC	central supply	54	1000piw 4ply	3,500	Feb-99
	9620	PVC	Fenner	54	800piw	8,000	Feb-99
DC-346	9641	PVC	Fenner	48	800piw Fenaplast	10,000	Aug-97
DC-352	9664	NCR	central supply		1000piw 4ply	2,000	May-98
DC-368	9715	PVC	Fenner	48	800piw Fenaplast	3,500	May-98
DC-379	9755	NCR	Fenner	54	1000piw 4ply	834	Aug-98
	9755	2G	Fenner	54	1000piw 4ply	632	Aug-98
DC-391	9815	NCR	central supply	54	1000piw 4ply	1,500	Feb-97
DC-396	9833	PVC	Fenner	48	800piw Fenaplast	3,500	Sep-99
DC-400	9847	PVC	Fenner	48	800piw Fenaplast	3,500	Dec-99
DC-404	9857	PVC	Fenner	48	800piw Fenaplast	7,000	Mar-00
DC-412	9895	PVC	Fenner	48	800piw Fenaplast	4,500	Aug-00
#5	9953	PVC	Fenner	48	800piw Fenaplast	2,500	May-01
#5	9951	2G	central supply	54	1000piw 4ply	6,000	Jul-01
#4	9889	2G	Scandora	60	1000piw 4ply 1/4x3/32 MineHaul	6,000	May-02
#4	9966	2G	Scandora	54	1000piw 4ply (For LW)	28,000	Jun-02
#4	9975	2G	Scandora	60	1000piw 4ply 1/4x3/32 MineHaul	3,600	Feb-03
#4	9976	2G	Scandora	60	1000piw 4ply 1/4x3/32 MineHaul	3,600	Apr-03