CCASE:

ARCH OF KENTUCKY V. SOL (MSHA)

DDATE: 19900319 TTEXT: Federal Mine Safety and Health Review Commission (F.M.S.H.R.C.)
Office of Administrative Law Judges

ARCH OF KENTUCKY, INC.,
CONTESTANT

CONTEST PROCEEDINGS

v.

Docket No. KENT 89-176-R Order No. 3174493; 5/8/89

SECRETARY OF LABOR,
MINE SAFETY AND HEALTH
ADMINISTRATION (MSHA),
RESPONDENT

Docket No. KENT 89-177-R Citation No. 3174494; 5/8/89

Docket No. KENT 89-178-R Citation No. 3174495; 5/9/89

Mine No. 37

Mine ID 15-14670

CIVIL PENALTY PROCEEDING

SECRETARY OF LABOR,
MINE SAFETY AND HEALTH
ADMINISTRATION (MSHA),
PETITIONER

Docket No. KENT 90-48
A. C. No. 15-04670-03600

Mine No. 37

v.

ARCH OF KENTUCKY, INC., RESPONDENT

DECISION

Appearances: Tina Gorman, Esq., and Edward Fitch, Esq., Office

of the Solicitor, U.S. Department of Labor,

Arlington, VA, for the Secretary;

Michael T. Heenan, Esq., and C. Gregory Ruffennach,

Esq., Smith, Heenan, & Althen, Washington, DC,

for the Respondent.

Before: Judge Fauver

The Company seeks to vacate a withdrawal order and two citations issued by the Secretary, and the Secretary seeks civil penalties for the two alleged violations, under the Federal Mine Safety and Health Act of 1977, 30 U.S.C. 801 et seq. At the hearing, the Company moved to withdraw its contest of the withdrawal order. That motion is granted, and Docket No. KENT 89-176-R will be dismissed.

These cases focus on the meaning of the April 20 amendment to the Company's roof control plan. The pivotal issue is whether

the amendment required remote-control shearer operators to station themselves outside the area between Shields 85 and 104 when the shearer was cutting in that area. The Secretary contends they had to stay outside the area. The Company contends they could stand anywhere in the walkway between Shields 85 and 104.

Having considered the hearing evidence and the record as a whole, I find that a preponderance of the substantial, reliable, and probative evidence establishes the following Findings of Fact and further findings in the Discussion below:

#### FINDINGS OF FACTS

- 1. On April 12, 1989, a coal outburst occurred on the tailgate side of the 004 Section of the R-9 Longwall Panel at Arch of Kentucky's No. 37 Mine. This was the Company's first experience with a coal outburst at the the No. 37 Mine. The R-9 Longwall Panel
- 2. The R-9 Longwall Panel is a standard longwall unit, developed by advancing two parallel sets of entries about 500 feet apart into a block of coal. After the entries penetrated approximately 7400 feet, they were connected by a set of perpendicular entries in which a longwall mining face was established. The key components at the longwall face are a set of longwall shields, which support the roof while the coal is being mined, and a shearing machine (in this case a Mitsui Trojan 700 Shearer), which moves back and forth across the face to mine the coal.
- 3. The longwall shields are chock-shields, which have roof support legs in the front, called props, and a cover in the back to protect from falling gob. Each shield is about 5 feet wide and has two sets of props which support a canopy that presses against the roof. The area between the front two props and the back of the shield serves as a walkway for the longwall crew members and permits them to travel along the longwall face with overhead protection from the canopy, lateral protection from the gob, and partial lateral protection from the face. The shields are attached to the pan line (in which the coal conveyer operates) by hydraulic cylinders, which pull the shields closer to the face and push the pan line closer to the face as mining continues.
- 4. After the shearer mines a portion of the face, propmen advance the shields toward the face. The canopy of each shield is lowered slightly from the roof. A positioning cylinder pulls the shield toward the face and simultaneously pushes the conveyor to the face. After this repositioning, the canopy is again raised and pressed against the roof. The shields on the 004

Longwall are numbered sequentially from No. 1 at the headgate to No. 104 at the tailgate.

- 5. The Mitsui Trojan 700 Shearer has two cutting wheels, either or both of which can be positioned high toward the roof, low toward the floor or in between depending on how the seam is to be cut. Each cutting wheel has a cowl that suppresses dust.
- 6. Depending on the direction the shearer is cutting (i.e. toward to the headgate or toward to the tailgate), one of the shearer wheels will be leading and one will be following. Typically, the leading wheel cuts near the roof and the following wheel cuts near the floor. Since the shearing machine does not turn around, but only moves back and forth across the face, one of the cutting wheels is always on the side of the machine closer to the headgate. This is called the headgate wheel. The opposite wheel is called the tailgate wheel.
- 7. The Mitsui Trojan 700 Shearer is controlled by two operators who usually move along with the shearer as it progresses across the face. Each shearer operator controls one of the shearer wheels and its cowl. On occasion, propmen serve as relief shearer operators.
- 8. The shearer can be controlled either by remote control or manually. While operating by remote control, the shearer operator is able to remain in the walkway behind the props a distance of one or many shields from the shearer. While operating mannually, the shearer operator must walk right next to the machine, inby the walkway. Prior to the coal outburst on April 12, 1989, the general procedure was to operate the leading shearer wheel by remote control and to operate the following shearer wheel manually.

#### The April 12, 1989, Outburst

- 9. A coal outburst is not a roof collapse but rather, as the term implies, it is a sudden bursting of coal from the face. Coal outbursts are typically the result of the squeezing of unmined coal between underlying and overlying strata. Such coal outbursts are also referred to as "mountain bumps" or "bounces."
- 10. Although it is not exactly clear what factors cause pressures on the face to increase, there is likely to be an increase when the roof over mined areas fails to collapse. This leaves more overhead weight on less coal support. The longer the increased pressure remains on the unmined coal, the greater the chance for an outburst at the face.
- 11. In this case, sandstone strata overlying part of the R-9 Panel was, in retrospect, apparently retarding falls in the mined area and thereby increasing the pressures on the face. This, coupled with the unyielding sandstone underneath the shale

floor of the section, created the squeezing conditions at the face

- 12. A coal outburst occurred on April 12, 1989. Two miners were struck by flying coal. Neither man was seriously injured, and no citations were issued. One of the miners, a propman, was standing in front of the props near the pan line. The other miner, the headgate wheel operator, was in the walkway.
- 13. Due to the force of the coal outburst, the Mitsui Trojan 700 Shearer was substantially damaged and had to be removed from the mine for major rebuilding. Solid steel pieces were twisted and bent. The damage was extensive. The cost of repairing the shearer and lost production was about \$2 1/2 million.

# Company Response to the Outburst

- 14. After the outburst, the Company's longwall safety coordinator, Dickie Estep, contacted MSHA and the Kentucky Department of Mines and Minerals. The following morning, April 13, 1989, Bob Blanton, MSHA inspector, informed Dickie Estep that the longwall was under a section 103(k) order. After investigating the outburst, MSHA did not issue any citations and the section 103(k) order was terminated.
- 15. Following the outburst, mine management began to gather information to help the Company formulate procedures to help prevent outbursts in the future. The Company contacted the Bureau of Mines for technical advice, hired Agapidu & Associates, a consulting firm specializing in longwalls, and contacted a German expert on longwalls and other mining companies that had experience with outbursts, including Midcontinent, UP&L and Cottonwood mines.

# MSHA Request For Roof Plan Modifications by April 28, 1989

- 16. On April 14, 1989, MSHA requested the Company to modify its Roof Control Plan to develop "measures to control coal bursts in areas where the longwall face is penetrating sandstone rolls." Its letter was in accordance with 30 CFR 75.220, which calls for additional measures if unusual hazards are encountered. MSHA knew that the Company wanted to resume operation of the longwall as soon as possible in order to alleviate pressure on the face. The letter requested the Company to submit plan modifications by April 28, 1989.
- 17. After contacting various experts, the Company began to formulate a plan to help prevent outbursts and to protect miners in the event of another outburst. Dan Stickel, the superintendent of the No. 37 Mine, and John Lozier, the longwall mining engineer, met to discuss both preventive and protective

measures. As Superintendent, Dan Stickel, was responsiblee for final Company decisions affecting the safety of all miners at the No. 37 Mine.

18. Dan Stickel's contemporaneous notes from the above meeting outline the specific precautions the Company intended to take to prevent another outburst and to protect miners. With regard to protecting miners, his notes stated:

Limit the number of people at the shearer in the potential bump area. The operators and propmen will be required to operate the machine remotely and away from the machine. Extra precaution will be taken the last 100 feet at the tailgate. The last 100 feet of mining at the tailgate will be done by remote control only. Manual operation will not be used. [Tr. 2 at 199-201.]

- 19. Following the meeting between Stickel and Lozier, Lozier drafted a memorandum summarizing the meeting. The memorandum stated that the Company would "limit the number of people at the shearer during the cut on the tailgate" and not allow "propmen . . . [to] be in the general area of the shearer." Jt. Ex. 9.
- 20. In the meantime, Dickie Estep kept MSHA apprised of the status of repairs on the shearer and the date the Company expected to resume mining. Based on the repair schedule, the Company planned to resume mining on April 21 or 22, 1989. The Company was anxious to resume mining to relieve pressures on the face that were causing it to deteriorate. In this connection, MSHA also wanted the Company to start mining to relieve the pressures on the face.
- 21. Apart from the process for modification and approval of the roof control plan, which was not scheduled to be officially completed until sometime after April 28, 1989, it was the Company's intention to implement the safety precautions developed by Stickel and Lozier before resuming production.

The April 20, 1989, Meeting to Discuss Company Progress in Developing a Plan

22. On April 19, 1989, MSHA Roof Control Specialist Gary Harris called Dickie Estep to set up a meeting at an MSHA office to discuss the type of modifications the Company was considering. The Company believed that the meeting, which was scheduled for the next day, April 20, 1989, would be the first of several meetings. The typical procedure for modifying a roof control plan was to meet with MSHA several times and exchange ideas. With this in mind, and considering that MSHA's letter called for submission of modifications by April 28, 1989, the Company

attended the April 20 meeting without having a written plan ready to submit for approval.

- 23. The meeting was at an MSHA office. Company representatives were Dickie Estep, Dan Stickel, and Mike Lincoln, who is a geologist. The MSHA representatives included Roof Control Specialist Gary Harris, Supervisor Tom Hooker, and Ken Dixon, MSHA Chief of Engineering Services at the District office.
- 24. The meeting began, as expected, with an exchange of information and ideas on coal outbursts. MSHA's Ken Dixon relayed his experience with outbursts and recommended certain options to consider for controlling them.
- 25. At this point in the meeting, the Company representatives told MSHA that they had developed a list of operating procedures to prevent outbursts which they planned to implement when they resumed mining. Although the Company representatives had developed safety precautions for immediate implementation, they explained that they did not have a formal plan ready to submit for approval. At the same time, they advised MSHA that they intended to resume mining on either April 21 or 22, 1989. The MSHA representatives replied that to do so the Company must submit modifications for approval on that day, adding that if the Company did not submit a supplemental plan, MSHA would reinstate the 103(k) order. The Company representatives suggested that they return to the mine to develop a plan, but MSHA insisted that they submit a plan immediately if they wanted to resume mining as planned.
- 26. Concerned about the increasing pressures and deterioration of the longwall face, the Company representatives decided to summarize for MSHA the new safety procedures that they had developed. The Company's planned procedure of operating remotely was mentioned, but was not discussed. Afterwards, Mr. Dixon told the Company representatives that "those were the things that we were looking for," and Mr. Dixon and the other MSHA officials said they would leave the room to give the Company time to draft a plan for submission.
- 27. Dickie Estep, Dan Stickel and Mike Lincoln drafted a plan, based on the notes in Dan Stickel's notebook.
- 28. The Company representatives returned to the meeting and submitted a Supplemental Roof Control Plan to MSHA. The MSHA representatives reviewed the plan, and made one change, which clarified that the plan applied only to the R-9 Longwall Panel. There was no additional discussion regarding any other provisions. MSHA offered to have the plan typed in letter form addressed from the Company to MSHA. This was done, and Dickie Estep signed the plan. By letter dated the same day, April 20, 1989, MSHA approved the plan. The approval was tentative and limited to a period of 60 days, during which there was to be an evaluation to

determine the Supplemental Plan's contribution to employee safety.

29. Following the meeting, MSHA's Gary Harris discussed the plan with his supervisor, Frank Strunk. There was no discussion as to any specifics for remote operations in terms of "distances," "feet" or other "measurement." Tr. 1 at 56.

The Company's April 20, 1989, Supplemental Roof Control Plan

30. The Supplemental Roof Control Plan approved by MSHA was as follows:

April 20, 1989 Mr. Joseph J. Garcia, District Manager Mine Safety & Health Administration HC 66, Box 1762 U.S. 25E. South Barbourville, Kentucky 40906

RE: Arch of Kentucky, Inc., No. 37 Mine, I.D. No. 15-04670, Supplement of Roof Control Plan coal and rock outburst.

Dear Sir:

We request the following procedures be reviewed and approved to control potential coal and rock bursts on R-9 Longwall Section when such potential coal and rock burst conditions are known to exist.

- 1. Review geologist's study on R-9 Longwall Panel to identify bump prone areas such as massive sandstone roof and mine floor.
- 2. Modify operating procedures in potential bump areas by:
  - A. Minimizing the distance the headgate is in front of the tailgate.
  - B. Closely monitor the gob overhanging to evaluate potential burst/bump conditions.
  - C. Monitor face advance rate. Production will be used to keep the face advancing.
  - D. Limit the number of people at the shearer in potential bump area.

- E. The operators and propmen will be required to operate the machine remotely from #85 shield to #104 shield.
- F. #85 through #104 shields will be advanced as soon as the full face web is cut.
- 3. A study shall be conducted by the USBM to develop a coal and rock burst plan prior to mining on the R-3 Panel.

If you have any questions call me at 848-5431.

TLZ@@Sincerely,

TLZ@@Joe R. Estep

Implementation of the April 20, 1989, Supplemental Plan

31. Before mining resumed, the miners on the 004 Section of R-9 Longwall Panel were instructed how to operate under the procedures of the Supplemental Plan. Foreman Ralph Price recorded his instructions on implementing the plan in a memorandum. Jt. Ex. 11. He instructed the miners that, "when running the shearer at the tail" they would have to "stay in shields," "not to get out in front of shields" and "use the radio [control] for turning the headgate cowl." Jt. Stip. 43, Jt. Ex. 11. The crews on other shifts received similar instructions. On April 22, 1989, the 004 Section resumed operations.

## The May 8, 1989, Coal Outburst

- 32. On May 8, 1989, a second coal outburst occurred. The outburst was between shields 91 and 101. (As in the case of the first outburst, this was on the tailgate side of the section.) The tailgate operator, Chuck Dudash, was at the No. 99 shield, operating the tailgate shearer wheel using remote control. The headgate operator, John Thompson, was at the No. 91 shield, operating the headgate shearer wheel using remote control. Although Thompson was inside the props he was struck by flying coal and suffered fractured ribs and a shoulder injury. He was nearly buried by flying coal.
- 33. After investigating the second outburst, the MSHA inspector issued two citations. Citation No. 3174494, issued on May 8, 1989, alleges a violation of 30 CFR  $\,$  75.220, and states in part:

The headgate side shearer operator was not operating the shearer remotely from the No. 85 shield. The headgate shearer operator was operating the shearer

on remote control; however, he was stationed at the No. 91 shield. The approved roof control plan stipulated in Item 2.E. that the operators and propmen will be required to operate the machine remotely from the No. 85 shield to No. 104 shield.

34. Citation No. 3174495, issued on May 9, 1989, also alleges a violation of 30 CFR 75.220, and states in part:

The tailgate side shearer operator was not operating the shearer remotely from the No. 85 shield. The tailgate shearer operator was operating the shearer in possession of the radio control, however, he was stationed at the No. 99 shield. The approved roof control plan stipulates in item 2.E. that the operator and propmen will be required to operate the machine remotely from the No. 85 shield to the No. 104 shield.

35. At the hearing, the Secretary moved to amend Citation No. 3174495 on the ground that the original intent of the citation was to allege a violation for failure to position the tailgate operator at shield 104. The Company opposed the motion. The motion was granted. As amended, Citation No. 3174495 states, in pertinent part:

The tailgate side shearer operator was not operating the shearer remotely from the No. 104 shield. The tailgate shearer operator was operating the shearer in possession of the radio control, however, he was stationed at the No. 99 shield. The approved roof control plan stipulates in item 2.E. that the operator and propmen will be required to operate the machine remote from the No. 85 shield to the No. 104 shield.

Modification of Supplemental Roof Control Plan After the May 8, 1989, Outburst

36. Following the May 8, 1989, outburst, MSHA issued an imminent danger withdrawal order. In order to resume mining the Company modified the plan, with MSHA approval, to add the following provision:

While the shearer is cutting anywhere past the Number 85 shield, no employees will be allowed in the area except the tailgate shearer operator who will be stationed at Shield 103 or 104. The operator will be operating the shearer by remote control through this area from the said remote locations . . . [Jt. Ex. 15.]

# DISCUSSION WITH FURTHER FINDINGS

On April 12, 1989, the No. 37 mine experienced a coal outburst in which two men were struck by flying coal. Neither

man was seriously injured, and no citations were issued. As a result of the outburst, MSHA requested Arch to change its roof control plan to take into account the potential for further outbursts. A meeting was held at the MSHA office in Barbourville, Kentucky, on April 20, 1989, at which MSHA and Arch representatives discussed proposed changes in the roof control plan. A Supplemental Roof Control Plan was submitted to MSHA that day and approved tentatively for 60 days.

A second outburst occurred on May 8, 1989. One man was seriously injured. The same day, MSHA investigator James Poyner issued an imminent danger order and one citation for violating the Supplemental Plan. The following day he issued a second citation charging a violation of the Supplemental Plan.

This case focuses on the meaning of provision 2.E of the Supplemental Roof Control Plan, which states:

The operators and propmen will be required to operate the machine remotely from #85 shield to #104 shield.

The Secretary contends that this provision required the remote control shearer operators to remain outside the area between Shields 85 and 104 when the shearer was cutting within such area. The Company contends that the operators could stand anywhere in the walkway between Shields 85 and 104 while operating the shearer by remote inside that area.

An analysis of a written document must begin in the first instance with the specific language. Tennessee Valley Authority v. Exxon Nuclear Co., Inc., 753 F.2d 493, 496-97 (6th Cir. 1985) (contract); Mallard v. U.S. District Court for Southern District of Iowa, 109 S. Ct. 1814, 1818 (1989) (statute); Bradley v. Autin, 841 F.2d 1288, 1293 (6th Cir. 1988) (statute). Where the language is clear and unambiguous, a court must regard it as conclusive and should not look to other aids of construction. Tennessee Valley Authority, 753 F. 2d at 496; Bradley 841 F.2d at 1293.

The express language of the Supplemental Plan provides that "operators and propmen will be required to operate the machine remotely from #85 shield to #104 shield." Provision 2.E does not state that the machine will be operated from remote locations at 85 and 104 and not in between. Rather, it states that the machine will be "operate[d]. . . remotely from #85 shield to #104 shield." Thus there is no express requirement for operators to station themselves at Shield #85 or at Shield #104, or at any other specified location.

A written document must be read as a whole; particular provisions should not be read in isolation. U.S. v. Morton, 104 S.Ct. 2749, 467 U.S. 823 (1984) (statute); Washington Metro v.

Mergentime Corp., 626 F.2d 959 (D.C. Cir. 1980) (contract). Also, different provisions of the same document must be read and interpreted consistently with each other, avoiding conflicts. U.S. v. Stauffer Chemical Co., 684 F.2d 1174 (6th Cir. 1982) aff'd 464 U.S. 165 (statute). In this case, provision 2.E of the Supplemental Plan must be read in light of the other provisions of the document.

Provision 2.D of the Supplemental Plan limits the number of persons in the potential bump area, that is, between Shields 85 and 104. The provision specifically states:

Limit the number of people at the shearer in potential bump area.

The Company's intention, which is expressed in this language, was to limit, not to eliminate, nonessential personnel in the bump prone area. Tr. 1 at 223, Tr. 2 at 79. The Company believed that with fewer people in the area of the shearer, the chance of injury was greatly reduced. Tr. 1 at 220, 221.1

Had the Company intended to eliminate persons in the area between Shields 85 and 104, the drafters of the plan would have used the word "eliminate" instead of "limit." MSHA had the authority to insist on the word "eliminate" or "exclude," but it did not do so.

The Company's choice of the word "limit" in provision 2.D cannot be ignored. Effect must be given to each part of a document to avoid making any word or part meaningless or superfluous. Reiter v. Sonotone Corp., 99 S.Ct. 2326, 442 U.S. 330 (1979) (statute); Fulps v. City of Springfield, Tenn., 715 F.2d 1088 (6th Cir. 1983) (statute). The Secretary's interpretation that Section 2.E makes the area between Shields 85 and 104 a "no-man's land" (Secretary's Brief p. 10) is contrary to the meaning of provision 2.D. If accepted, this would make the word "limit" and the entire provision 2.D superfluous and meaningless.

Provision 2.E of the Supplemental Plan was intended to improve the safety of miners. Prior to the Supplemental Plan, the lead wheel operator would often operate the machine by

remote, standing in the walkway. The following wheel operator typically operated the wheel manually, walking immediately along side the machine and using the controls on the deck of the machine to adjust the wheel whenever it cut too deep or too shallow. At the time of the April 12, 1989, outburst, the headgate operator was using the manual controls to control the following wheel.

After the Supplemental Plan was adopted, both operators were required to use the remote control to operate the shearer. Because the shearer can receive signals from only one remote control device, it was necessary for the shearer operators to share the remote control. They would cooperate so that one operator could control the wheel of the other according to exchanged signals.

Although the April 20 change was intended to reduce the likelihood of injury, the Company seriously misjudged the dangers involved. Despite being behind the props, the shearer operators in the walkway in the bump prone area were in peril.2 Thus, in the May 8 coal outburst, one of them was seriously injured and nearly buried in flying coal.

The Secretary contends that the Company had a duty to avoid ambiguity in its roof control plan and to resolve any ambiguity in favor of protecting its miners. She points out that the first outburst (April 12) did considerable damage to the longwall shearer. The force of the outburst was substantial, severe enough to tear up six-inch steel and cover the walkway with 18 inches of coal. Two miners were in the bump prone area and they were both hit by flying coal. The Secretary contends that it was not reasonable for the Company to assert that standing within the walkway would provide adequate protection from such a potentially dangerous condition.

She argues that the Company's failure to resolve any ambiguity it may have discerned in the plan was a significant contributing factor to the injury sustained in the second outburst. She concludes, "whatever the reasons may be for Arch's misinterpretation of the terms of the roof control plan, the operator was guilty of a moderate to high degree of negligence." Secretary's Brief p. 13.

However, the facts, as outlined in the Findings, show that the Company drafters intended to have the plan permit remote control operators to stay in the walkway between Shields 85 and 104. (It was not an ambiguity to them.) The language of the April 20 plan did not state otherwise, and one of the key provisions (2.D) would be meaningless without recognizing the Company's intention in provision 2.E. It is true that the Company's April 20 plan permitted a dangerous condition to continue. The Secretary could have prevented this, but she did not do so. She finally corrected it, after a second coal outburst and a serious injury, by issuing an imminent danger order (which is no longer contested). It was then, and only then, that the Company came up with a modification to require that no one be permitted in the area between Shields 85 and 104 while the shearer was cutting in that area.

The later modification may not be applied retroactively to change the meaning of the Supplemental Roof Control Plan of April 20, 1989. That plan did not require the stationing of shearer operators outside the area between Shields 85 and 104. It was therefore not a violation of the plan to operate the shearer by remote while standing in the walkway between Shields 85 and 104.

#### CONCLUSIONS OF LAW

- 1. The judge has jurisdiction in these proceedings.
- 2. The Secretary failed to prove a violation as alleged in Citation No. 3174494.
- 3. The Secretary failed to prove a violation as alledged in Citation No. 3174495.

ORDER

#### WHEREFORE IT IS ORDERED that:

- 1. Citation No. 3174494 and 3174495 are VACATED.
- 2. Docket No. KENT 89-176-R is DISMISSED.

William Fauver
Administrative Law Judge

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- 1. It was the first outburst on April 12, 1989, which prompted the Company to limit the number of people at the shearer in the bump prone area. As a result of the first outburst, a propman, Larry Cornet, was injured. Propmen are not essential employees in the cutting area. The Company believed that by limiting nonessential persons from the cutting area, such as propmen, mechanics, and visitors, the likelihood of injury in the event of a future outburst would be greatly reduced.
- 2. In a bump prone area, the props do not provide the shearer operators with adequate protection from flying coal. Each

shield is approximately 5 feet wide. The props or legs are 12 inches in diameter. Thus, every five feet of travelway is protected by only 2 feet of metal. In other words, miners in the walkway have only 40% lateral protection from coal flying from the face.