# FEDERAL MINE SAFETY AND HEALTH REVIEW COMMISSION

OFFICE OF THE CHIEF ADMINISTRATIVE LAW JUDGE
1331 PENNSYLVANIA AVE., N.W., SUITE 1400
WASHINGTON, DC 20004-1710
TELEPHONE: 202 434-9987 / FAX 202 434-9949

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| SECRETARY OF LABOR<br>MINE SAFETY AND HEALTH<br>ADMINISTRATION (MSHA),<br>Petitioner,<br><br>v.<br><br>PRAIRIE STATE GENERATING<br>COMPANY, LLC,<br>Respondent. | CIVIL PENALTY PROCEEDING<br><br>Docket No. LAKE 2022-0017<br>A.C. No. 11-03193-542773<br><br><br><br>Mine: Lively Grove Mine |

## DECISION AND ORDER

Appearances: Edward V. Hartman, Esq., Office of the Solicitor, U.S. Department of Labor, Chicago, Illinois, for the Petitioner

Jason W. Hardin, Esq., and Artemis D. Vamianakis, Esq., FABIAN VANCOTT, Salt Lake City, Utah, for the Respondent

Before: Judge Young

## I. SUMMARY

**Citation No. 9199021, 30 C.F.R. § 75.517: Failure to insulate adequately and properly protect power cable.** Cable on a 995-volt continuous miner was not insulated adequately and properly protected.

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| Facts | | pp. 2-6 (Slip Op.) |
| Fact of Violation: | Affirmed | pp. 6-8 |
| Negligence: | Low | pp. 8-9 |
| S&S: | Yes | pp. 9-25 |
| Penalty: | $1,800 | pp. 25-26 |

This case arising under the Mine Safety and Health Act of 1977 ("Mine Act") involves a single citation that alleges Prairie State Generating Company LLC ("PSGC" or "Respondent") violated 30 C.F.R. § 75.517 for failing to insulate adequately and fully protect the power cable of a continuous mining machine. The Secretary cited the violation as significant and substantial ("S&S"), with moderate negligence and a reasonably likely risk of fatal injury to one miner from

the hazard contributed to by the violation. For the reasons set forth below, I affirm the violation and the S&S finding, find that the violation was the result of low negligence, and assess a penalty of $1,800.

## II. FACTS

PSGC operates the Lively Grove Mine and an associated coal-fired power plant located across the road from the mine portal in Southern Illinois. Tr. 19; Ex. JJ. PSGC is a nonprofit owned and operated by several municipal utilities. Tr. 243.

On July 16, 2021, Mine Safety and Health Administration ("MSHA") Inspector Stephen Tisdale was conducting a regular quarterly "EO1" inspection of the Lively Grove Mine. Tr. 28. He was accompanied by John Garrett, a representative of the operator with responsibility for safety and compliance issues. Tr. 30, 403-04, 406.

As part of the inspection, Inspector Tisdale examined the power cable attached to continuous mining machine No. CM-201. Tr. 37.[1] Inspector Tisdale examined the cable by "walking" it – using his bare hands to feel the cable for any damage – after de-energizing and locking out the machine. Tr. 37.

While examining the cable, Inspector Tisdale discovered an area of surface damage on the outer jacket of the cable. Tr. 38. He showed the area of damage to Garrett and used a small screwdriver to "clean" the damaged area.[2] Tr. 46-49.

Based on his evaluation of the surface damage, Inspector Tisdale decided to examine the interior of the cable. Tr. 50-51. This is commonly done by cutting open the jacket with a knife, exposing the interior of the cable. Tr. 42. When the jacket was cut open, the inspector found a small hole penetrating completely through the jacket. Tr. 38-39.

Inspector Tisdale issued a citation for failure to protect the CM-201 cable from damage, exposing miners to the risk of electric shock. Ex. P-1. The violation was assessed as S&S, with the potential exposure of one miner to a fatal injury. *Id.* PSGC abated the violation by removing the cable from service. *Id.*

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[1] The cable at issue in this case was a Nexans AmerCable Tiger Brand 36-505 Type SHD-CGC 3/C, 2,000 Volts cable. Tr. 253; Ex. O.

[2] There was a minor dispute about whether the use of the screwdriver may have further damaged the cable and whether Garrett had asked Inspector Tisdale not to use the screwdriver to clean the damaged area on this occasion. *See* Tr. 99, 101, 413; Ex. G. A screwdriver represented as substantially identical to the one used during the inspection was used as a demonstrative exhibit. The entire length of the handle and blade was approximately 4" and the blade appeared to be less than 1/8" in diameter. Given the size of the screwdriver, the durability of the jacket, and the very minor damage to the outer jacket, I find that Inspector Tisdale could not have damaged the jacket by probing it and that the dispute about using the screwdriver is immaterial to these proceedings.

### A. The Condition of the Cable

Both the actual damaged segment of the outer jacket and a sample cross-section of cable were produced as physical exhibits. *See* Ex. P-7 (photograph of cable). The cable components include two uninsulated ground wires, three insulated and shielded phase conductors, a pilot wire, and an inert plastic spacer. Tr. 93, 154, 262. The resulting cable is nearly solid, and witnesses testified that it is difficult to flex or bend by hand. Tr. 363-64, 553.

The entire cable is braided inside, so that components twist around one another. Tr. 93, 261-62; Ex. P-7. The cable is rated to carry 2,000 volts. Tr. 53. The continuous miner at issue, CM-201, draws 995 volts and is commonly referred to as a "995 miner." Tr. 53, 59.

The phase conductors are insulated with a durable insulated cover. Tr. 206-07. The insulation is 80 mills, or 0.08", thick. Tr. 209-10. The insulation is covered with braided copper shielding that is "tinned" to resist corrosion. Tr. 194-195. The tinned shielding is grounded. Tr. 194.

The inspector found a small hole, approximately 1/4 inch to 5/16 inch long, penetrating completely through the jacket. Tr. 38-39. The hole did not pierce through the jacket in the most perceivable area of damage to the exterior of the jacket but resulted from a less-obvious area of damage about an inch-and-a-half away. Ex. P-7. The hole penetrated the jacket above one of the ground wires, with the striations of the ground wire visible impressed in the cable jacket in the area of damage. *Id.*

Inspector Tisdale testified that damage to the outer jacket could expose a miner handling the cable in the damaged area to the risk of electric shock. Tr. 57-60. However, the shock hazard could only present if the insulation to at least one of the phase conductors was also breached. In that event, the current from the phase conductors could flow to the uninsulated copper ground wires, to the grounded shielding, or to the exterior of the cable. Tr. 68-69.

While the exterior of the cable was damaged, exposing the interior of the cable, the inner insulation around the phase conductors was not penetrated. Tr. 393-94. However, it was discovered that there was damage to the insulation consists of minor surface cracks that the operator's expert referred to as "weather cracking."[3] Tr. 98, 393-394; Ex. P-2.

The damage to the phase wire insulation is consistent with the deformation described by Inspector Tisdale. The weather cracking is only visible if the insulation is flexed. This suggests that severe crushing force was applied to that area of the cable, because the cable is molded as a unit, with components compressed tightly within the jacket. Tr. 93.

[3] Counsel for the Secretary rejected this characterization, noting that the interior of the cable obviously had not been exposed to weather. Tr. 393-94, 362. Cody Christian, Respondent's expert, replied that this is what the cracks looked like. Tr. 490. I credit his characterization of the appearance of the cracks, which are fine, web-like cracks not visible unless the insulation is flexed.

Only severe stress could cause enough movement to damage the phase insulator, which is made of a flexible material. Tr. 154-55. Furthermore, the mine's compliance manager, Todd Grounds, essentially acknowledged that Inspector Tisdale had noted during his examination that the cable was misshapen. Tr. 323.

In addition to the shielding and the insulation around the phase conductors, the cable was also guarded by a circuit that would shut off the current if stray electricity inside the cable exceeded six or seven amps. Tr. 174, 523. *See also* Ex. T (providing specifications for the ground fault relay).

**B. Potential Hazard from Exposure to the Interior of an Energized Cable**

Both Inspector Tisdale and MSHA Special Investigator Bubby Whitfield, MSHA's expert witness, testified that a fatal injury could result from exposure to as little as 100 milliamps of electricity. Tr. 59-60, 167-68. This testimony was essentially undisputed. Thus, a fatal injury could result from exposure to as little as than 1/70 the amperage required to shut down the power to the continuous miner.

According to Inspector Tisdale's testimony, there were also observable "gaps" in the braided copper shielding which serves as a grounding. Tr. 128. There is sufficient evidence to support a finding that the integrity of the shielding, like that of the phase conductor's insulation, had been compromised.[4]

In addition to the damage to this cable noted during the inspection, the mine's own inspection records show that the same cable was repaired after a "questionable spot" was discovered.[5] Tr. 283; Ex. U (Lively Grove maintenance report describing this "questionable

[4] The operator questioned the assessment of the damage and claims that Inspector Tisdale effectively changed his testimony by not including an assessment of the damaged shielding in his notes or the citation. Resp't Br. at 7. The operator further argued that the process of removing the outer jacket from the cable is inherently destructive – a witness described it as "violent" – and that witnesses testified that they would often find red fibers from the cover, and occasionally shielding material, embedded in the outer jacket. Tr. 128-29, 415, 418-19. *See also* P-7 (image of the cable showing fibers embedded in the outer jacket of the cable).

Inspector Tisdale, for his part, testified credibly about the deformation of the cable, and he described the effect that such pressure can have on the integrity of the cable. He said that the removal of the cover required finesse, not force. Tr. 589. The miners and the inspector had removed the outer jackets of cables numerous times, and I find that the witnesses all had an appropriate level of experience with the process. I find that the Secretary has established that the damage more likely than not occurred before the outer jacket was removed.

[5] The examination record of the repair shows that it was performed on the same day as the inspection. Ex. U. Neither party attached any significance to this fact, so I find that it is merely a coincidence.

spot" and subsequent repair work). The cable was repaired by cutting off the end of the cable past the "questionable" portion and reattaching the cut end to the machine. Tr. 372; Ex. U.

### C. The CM-201 Continuous Miner

The cable in question here connects the power center to the CM-201 continuous miner and provides electric power to the machine. Tr. 36; Ex. P-1. Cables in this mine could be up to 1,000 feet long. Tr. 36.

While the continuous miner is cutting the coal seam, it carries a coiled length of cable called the "cut loop." Tr. 336-37. About 60 to 80 feet of cable is carried in the cut loop, which allows the continuous miner machine to move into the cut while minimizing the amount of loose trailing cable. Tr. 337. This part of the cable is routinely "roped up" or coiled. Tr. 337-38. The damage to the inner insulation was found in the "cut loop" of the cable. Resp't Br. at 22. *See* Tr. 77-78 (Inspector Tisdale describing the cut loop and noting "the damaged area was 40 feet out by the connection point where the cable connected to the miner").

The continuous mining machines weigh approximately 50 tons and move toward the coal face to engage a cutting head to remove coal from the seam. Tr. 381-82. During each "cut," the continuous miner typically moves forward and back at least eight times to make a 40-foot cut into the coal seam. Tr. 439-440. The forward and back movements of the continuous miner move the CM-201 cable trailing the miner. Tr. 328.

The continuous miner is capable of exerting force that could flex the cable, as well as assertions that other forces could also damage the cable. The cable is coiled, moved, and stretched during normal mining operations. Tr. 310. Witnesses handling the demonstrative segment of intact cable noted that it was difficult for even a strong person to flex the entire, integrated cable manually, and the process of cutting the cable jacket to expose the interior components was described by the operator's witnesses as "violent." Tr. 335, 415.

The cable is subject to up to 40 back-and-forth movements when cutting coal during a shift, which could put stress on the cable. Tr. 309-10. As the cable is moved, it is bent and coiled and that could cause the damage to get worse. Tr. 132, 310-11.

Cody Christian, the operator's expert witness, did testify about some future outcomes. He said that if the continuous miner ran over the cable, it would destroy it. Tr. 553-56. Other machines might also run over and damage the cable, and the continuous miner could exert force that would stress the cable, by pushing it up against the wall or flexing it in the "bend radius[]" of the cable. Tr. 556-57.

### D. Electrical Non-Destructive Testing of the Cable

To ensure that a cable's electric components retain their integrity and that they conduct and contain electric current as intended, the operator uses an electric testing device to assess the cable. Various manufacturers produce the devices, but one common make is "Megger," and the

testing is colloquially referred to by miners as "Megging," or testing with a "Megger." Tr. 65. The cable here was tested using one of these devices.[6]

The testing devices are rated to handle various voltages. Ex. P-9. Proper practice requires the use of a device capable of testing the current that the cable being tested may carry. *Id.;* Tr. 349-50. A common testing device is "rated," or recommended for use, at up to 1,000 volts. The operator's electrician and its expert witness testified that they commonly carry a 1,000 voltmeter with them and use it during their work. *See* Tr. 350, 542.

While the cable at issue here is rated to carry 2,000 volts and the machine would draw 995 volts, the continuous miners operate on alternating current. Tr. 176. The Fluke testing device used here is rated based on direct current. Tr. 176. To ensure the proper rating for the device being used, a conversion factor of 1.414 is used to account for the fact that alternating current operates on a "sine wave" pattern that has peaks and valleys. Tr. 177-78. *See also* P-8. Thus, the peak current for the 995 volts carried by the cable would be approximately 1407 volts in total (995 x 1.414). *See* Tr. 180 (Special Inspector Whitfield testifying the cable would be carrying "[a]pproximately 1,400 volts AC [alternating current]").

The total current being tested must account for the fact that the current is divided among the three phase conductors. Each conductor would thus be expected to carry a peak of about 469 volts (1407/3). In the event of a phase/phase short circuit, where two phase conductors are exposed, the total voltage would be about 938 volts (469 x 2). However, the potential hazard here, with one phase conductor exposed to a potential for a phase/ground short, the total voltage implicated is limited to that carried by the single phase cable, i.e. 469 volts.[7]

## III. DISPOSITION

### A. Fact of Violation

Inspector Tisdale issued 104(a) Citation No. 9199021 on July 16, 2021, alleging a "significant and substantial" violation of 30 C.F.R §75.517 that was "reasonably likely" to cause an injury that could reasonably be expected to be "fatal" and was caused by Respondent's "moderate negligence."[8] Ex. P-1. The "Condition or Practice" is described as follows:

> Company #201 Miner's trailing cable is not being adequately protected nor insulated. There is a hole through the outer jacket exposing the inner energized conductors. This hole measures approximately 1/4 of an inch in length and is

[6] The device used in this case was manufactured by Fluke. Tr. 351.

[7] No witness testified to a scenario that would implicate all three phase cables or a potential voltage greater than 1,000.

[8] The docket also originally contained Citation No. 9037896. Respondent withdrew its contest of Citation No. 9037896 prior to the hearing. Notice of Withdrawal of Contest of Citation 9037896 (Aug. 18, 2022).

approximately 40' feet from the cable clamp. This machine was in service and located on the Main north unit at the time of inspection.

*Id.*

Under 30 C.F.R. §75.517, "Power wires and cables, except trolley wires, trolley feeder wires, and bare signal wires, shall be insulated adequately and fully protected." The Mine Act imposes strict liability for violations of mandatory safety standards. Thus, the operator may be found to have violated the Act despite the absence of any fault or negligence on its part. *Nally & Hamilton Enterprises*, 38 FMSHRC 1644, 1650 (July 2016) (citing *Sec'y of Labor v. Nat'l Cement Co. of Cal.*, 573 F.3d 788, 795 (D.C. Cir. 2009); *Spartan Mining Co.,* 30 FMSRHC 699, 706 (Aug. 2008); *Asarco, Inc.,* 8 FMSHRC 1632, 1634-36 (Nov. 1986), *aff'd,* 868 F.2d 1195 (10th Cir. 1989)).

In order to establish a violation of one of her mandatory safety standards, the Secretary must prove that the violation occurred "by a preponderance of the credible evidence." *Keystone Coal Mining Corp*., 17 FMSHRC 1819, 1838 (Nov. 1995) (citing *Garden Creek Pocahontas Co.*, 11 FMSHRC 2148, 2152 (Nov. 1989)).

I find that the operator violated 30 C.F.R. § 75.517. The Secretary's witnesses credibly testified about the visible damage to the cable. Tr. 38-39, 152. Inspector Tisdale noted an area of surface damage that penetrated through the insulating outer jacket of the cable and visible deformation of the cable. Tr. 38-39, 43.

The only way to assess the physical integrity of the interior components is to cut the cable open, which was done here. *See supra* Section II.A. (describing Inspector Tisdale cutting the cable). The inspection of the interior confirmed that the exterior jacket had been fully penetrated. *Id.*

Although the damage extending to the inside is very small – little more than a pinhole – the Secretary's witnesses testified that this could permit electric current to escape the interior of the cable under some circumstances. Tr. 98. The operator's witnesses did not refute this evidence.

I also credit the inspector's opinion that the cable was either flexed or compressed by the movement of the continuous miner, or it was run over by another piece of mobile equipment. The inspector testified that the shape of the cable was deformed by compression. Tr. 43. Instead of being approximately round, the cable was compressed into an oval profile. Tr. 43.

The inspector testified that compression of the cable stresses the internal components and can affect the integrity of the cable. The witness described the effect as being "like rolling an orange in your hands, and it pulls the skin loose from what's inside." Tr. 128. Inspector Tisdale also testified about operational conditions that could result in such damage to the cable. Tr. 132.

I find that the Secretary has demonstrated that PSGC failed to insulate adequately and protect the cable from damage. Both the outer and inner layers of insulation provide important

protection against electrical shock. The evidence establishes that there was both visible physical damage to the outer jacket and deformation of the cable. Most importantly, the damage to the outer jacket penetrated through the outer layer. Accordingly, PSGC violated the standard in section 75.517 as the CM-201 Cable was not insulated adequately and fully protected.

**B. The Operator's Negligence was Low**

While a finding of violation does not require proof that PSGC was negligent, the inspector assessed the operator's negligence as moderate. The Secretary has the burden of proving the operator's negligence.

I am not bound by the Secretary's definitions of negligence but assess the operator's culpability holistically, using a traditional negligence analysis. *Brody Mining, LLC,* 37 FMSHRC 1687, 1701 (Aug. 2015); *accord Mach Mining, LLC v. Sec'y,* 809 F.3d 1259, 1264 (D.C. Cir. 2016). I find that the operator failed to use the requisite care a reasonable person would have employed under these circumstances.

While the operator appears to have been attentive, it did not notice damage that, while not obvious, would have been found by a careful hand-over-hand examination. I infer this because the inspector did discover the damage during his own examination of the cable using the hand-over-hand process.

This is not a case where the outer jacket was sliced open or split. The two visible areas of surface damage were slight. The small surface nicks could have been obscured by mud or dirt – the inspector in fact used a small screwdriver to clean the areas – making visual detection difficult. Furthermore, the area that appeared to be more damaged on the outside is not where the damage pierced the jacket and exposed the inside of the cable.

The operator's witness testified that he would inspect the cable the same way Inspector Tisdale had – by "walking" the cable hand-over-hand, without gloves, during the permissibility examination. Tr. 304-05. The Secretary has accepted that the most recent permissibility exam, on July 13 – four days before Inspector Tisdale discovered the damage – was performed this way and no damage was discovered. *See* Sec'y's Br. at 16 (stating "the damage to the cable occurred sometime between the July 13th inspection and Inspector Tisdale's discovery of the damage on July 17, 2011").

The damage was only evident to the inspector during a hand-over-hand examination, performed without gloves. Tr. 37-38. However, the normal pre-shift examination procedure provides only a visual examination of the entire length of cable. Tr. 303. The Secretary has not asserted that a visual pre-shift examination of the cable falls below the requisite duty of care. I also note that no citation was issued for such failure. Tr. 111.

Additionally, the cable had been either observed as damaged or examined and found to be damaged in another location on the same date as the inspection at issue. Ex. U. Thus, it is reasonable to infer that the operator was properly attentive to the condition of the cable.

The Secretary has not demonstrated that the visual examination is generally insufficient to meet the obligation to perform a proper pre-shift examination. I therefore find that the operator's negligence was low.

**C. The Citation Was Properly Characterized as S&S.**

A violation is properly designated as S&S if, "based upon the particular facts surrounding the violation, there exists a reasonable likelihood that the hazard contributed to will result in an injury or illness of a reasonably serious nature." *Mathies Coal Co.*, 6 FMSHRC 1, 3 (Jan. 1984) (citing *Cement Div., Nat'l Gypsum Co.*, 3 FMSHRC 822, 825 (Apr. 1981)). The four elements required for an S&S finding are expressed as follows:

> (1) [T]he underlying violation of a mandatory safety standard; (2) the violation was reasonably likely to cause the occurrence of the discrete safety hazard against which the standard is directed; (3) the occurrence of the hazard would be reasonably likely to cause an injury; and (4) there would be a reasonable likelihood that the injury in question would be of a reasonably serious nature.

*Peabody Midwest Mining, LLC*, 42 FMSHRC 379, 383 (June 2020) (integrating the refinement of the second *Mathies* step in *Newtown Energy, Inc.*, 38 FMSHRC 2033, 2037 (Aug. 2016)).

An S&S determination must be based on the assumed continuation of normal mining operations. *See Consol Pa. Coal Co.*, 43 FMSHRC 145, 148 (Apr. 2021) (citing *U.S. Steel Mining Co.*, 6 FMSHRC 1573, 1574 (July 1984); *Gatliff Coal Co.,* 14 FMSHRC 1982, 1986 (Dec. 1992)) ("A determination of 'significant and substantial' must be based on the facts existing at the time of issuance and assuming continued normal mining operations, absent any assumption of abatement or inference that the violative condition will cease.").

Respondent incorrectly characterized the timing requirement for analyzing S&S. It accurately cites language from the 2021 *Consol* decision to argue that the analysis must be based on facts existing at the time of issuance. *See* Resp't Br. at 5, 14. It fails, however, to recognize what the Commission said immediately after, and it challenges the Commission's precedent regarding assumed continuation of normal mining operations.

Respondent states, in its description of standards,

> A determination of "significant and substantial" must be based on the facts existing [a] at the time of issuance and [b] assuming continued normal mining operations, absent any assumption of abatement or inference that the violative condition will cease.

Resp't Br. at 5 (quoting *Consol Pa. Coal Co.*, 43 FMSHRC at 148 (citing *U.S. Steel Mining Co.*, 6 FMSHRC at 1574; *Gatliff Coal Co.,* 14 FMSHRC at 1986)). It then goes on to dedicate a section to the assertion that "the cited conditions did not create an electrical shock hazard <u>at the time of issuance</u> of the Citation." *Id.* at 14 (emphasis in original).

While Respondent correctly quotes *Consol*, that language differs from that in *U.S. Steel*. *Consol* stated the determination must be "based on" the facts existing at the time, 43 FMSHRC at 148. *U.S. Steel*, however, stated that the determination must be "made at the time" the citation is issued, "*but* in the context of 'continued normal mining operations.'" 6 FMSHRC at 1574 (emphasis added). A determination "based on" the facts existing at the time of issuance is different from one "made at the time" of issuance. The former would preclude addressing continued normal mining operations.

Respondent seems to argue here that the Commission changed the *U.S. Steel* standard to require analysis of whether conditions existed at the time of citation to support an S&S finding, with assumed continued operation being a separate analysis—as demonstrated by its added lettering to the quotation. While I acknowledge the language used in *Consol*, such a change did not occur.

In *U.S. Steel*, the Commission immediately followed its statement of the standard with an explicit refutation of the argument that there was no likelihood of injury resulting from the cable *at the time* of inspection and citation. *See* 6 FMSHRC at 1574 ("We reject this narrow interpretation of the statutory language. . . . . Such a measurement cannot ignore the relevant dynamics of the mining environment or processes; indeed this cable was in normal use at the time it was observed by the inspector. Under these circumstances, it was not error for the judge to evaluate the cited violation in terms of 'continued normal mining operations.'").

The Commission's decision in *Consol*, while employing language that could arguably support Respondent's argument, actually reaffirms the relevant principle from *U.S. Steel*. The Commission rejected an argument grounded on the fact that miners did not go under the roof *on the day of* citation. *See* 43 FMSHRC at 148 ("It contends that the only hazard that the standard [reflectors] was designed to protect against is a miner walking under unsupported roof. Obviously, *the fact that no one had been identified as going under unsupported roof on this specific day does not negate the danger of falling roof or that a miner on a break would not be reasonably likely to cross the threshold*.") (emphasis added).

Neither case, therefore, supports the contention that the S&S analysis includes only discussion of whether the conditions at the time of citation would make the occurrence of the hazard or injury reasonably likely. Any evidence or arguments supporting such a contention are therefore irrelevant to the analysis and will not be considered.

**1. Step 1 – A violation of a mandatory safety standard occurred.**

The existence of a slit in the outer jacket of a trailing cable demonstrates a failure to adequately insulate and fully protect a power cable. I have found a violation of this mandatory safety standard. *See supra* Section III.A.. This satisfies the first step of the Commission's S&S analysis.

**2. Step 2 – The violation was reasonably likely to result in miner contact with the damaged portion of the cable while energized, thereby exposing miners to an electrical current.**

Under the second step in determining S&S, the violation must be reasonably likely to cause the occurrence of the discrete safety hazard against which the standard is directed. The second step is a two-part process: (1) determine the specific hazard the standard is aimed at preventing; and (2) determine whether a reasonable likelihood exists that the hazard against which the mandatory standard is directed will occur. *Newtown Energy, Inc.*, 38 FMSHRC 2033, 2037 (Aug. 2013). This finding must be based on "the particular facts surrounding the violation." *Northshore Mining Co.*, 38 FMSHRC 753, 757 (Apr. 2016).

**a. The record supports a finding that miners were reasonably likely to contact an energized, damaged cable.**

The standard in section 75.517 is aimed at preventing a miner from encountering power cables that are inadequately insulated or not fully protected. Thus, in this case, the specific hazard is a miner contacting the damaged portion of the CM-201 trailing cable while the cable is energized.

The Secretary has established that the violation was reasonably likely to cause the occurrence of this specific hazard. Inspector Tisdale, Grounds, and Garrett all provided testimony that the trailing cable was handled by individual miners to move it. Tr. 76, 78, 338, 443-45. While most movement of the cable was conducted through the movement of the continuous miner, the testimony describes situations in which miners would move the trailing cable either with their hands or feet. Tr. 76.

Inspector Tisdale testified that when the continuous miner is moved from one side of the entry to the other, the trailing cable follows it and moves into the center of the crosscut. Tr. 76. Often, in these situations miners will use their hands or feet to reposition the trailing cable to one side of the entry, because ram cars must be allowed to entry to load coal. Tr. 76. Inspector Tisdale describes this as "a normal practice that is done very often." Tr. 77.

Garrett, who had previously worked as a continuous miner operator in the mine, similarly testified that there are times where the ram car operators would have to move the cable with their hands when the cable is energized. Tr. 444-45. At times, miners also must lift the cable to allow ram cars to pass under it. Tr. 445. He likewise admitted that there were probably times when he picked the cable up with his hands and moved it out of the way. Tr. 443-44.

The location of the splice on the cable was in an area that was specifically prone to being handled. Tr. 78. The damage to the insulation was found in the "cut loop" of the cable, a portion of the cable, usually at least 40 feet long, that allows the continuous miner to move back and forth from the faces. Tr. 77.

As the cut loop is moved by the continuous miner during its operation which may move it into the entry, this portion would be handled often. Tr. 78. While Grounds testified that the cut

loop is not handled more frequently than the remainder of the cable, Tr. 338, Inspector Whitfield testified that cut loop portion of the cable, which is where the damage was found, was often handled by miners in the course of their work.[9] Tr. 78. *But see* Tr. 428 (Garrett testifying it is "not a very frequent thing" for a continuous miner operator to handle the cut loop cable with their hands).

The evidence therefore shows that miners routinely would move the cable to allow ram cars to pass while the continuous miner was in operation and the power cable was energized. This handling of the cable in the cut loop could bring a miner's hand into contact with the damaged portion of the cable while it was energized. I therefore find the violation reasonably likely to cause the occurrence of the discrete safety hazard.

**b. Respondent incorrectly relies on the Commission's 2022 *Consol* decision to argue that the extent of the damage was insufficient for exposure.**

Respondent argues that the discrete safety hazard should be determined to be the "potential electrical shock from stray electrical current at a level sufficient to cause an injury and contact with the cited ¼" slit in the outer jacket of CM-201's shielded trailing cable." Resp't Br. at 10, *citing Consol Pa. Coal Co.*, 44 FMSHRC 37, 42 (Feb. 2022) ("*Consol Pa. Coal II*") (noting "[t]he hazard from a violation of section 75.517 is that it may cause an electrical shock to a miner resulting from contact with an inadequately insulated or not fully protected power cable"). In fixating on the "electrical shock", the Respondent conflates the discrete hazard in second step of the *Newtown Energy* Test with the injury inquiry in the third step.

Moreover, in *Consol Pa. Coal II*, the Commission stated that the "Step 2 issue [was] whether the violation was reasonably likely to expose a miner to an electrical current." *Consol Pa. Coal II*, 44 FMSHRC at 42. The Commission majority rejected the S&S finding because it found that it was not reasonably likely that a miner would contact the damaged portion of the cable, which was hung with hooks secured to the roof or rib. *Id.* at 43-44.

The Commission found no evidence that the cable could be easily knocked to the floor. *Id.* at 43. Therefore, it was not reasonably likely that a miner would grab the cable to hang it back up. *Id.* Additionally, the was no testimony as to whether or why a miner would be likely to reach overhead and grab the feeder cable or whether a miner would be exposed during feeder moves. *Id.* at 44.

Respondent's reliance on *Consol Pa. Coal II* is misplaced here because the CM-201 power cable was not secured and hanging by hooks. The evidence here shows that the cable was usually lying on the ground and that miners would handle the cable regularly while working with the continuous miner. Unlike *Consol Pa. Coal II*, handling the cable could regularly and directly expose miners to the damaged portion of an energized cable.

[9] Respondent also contends that miners did not contact the damaged portion of the cable because miners were trained always to wear gloves. Tr. 289; Ex. FF. While is it the policy of the mine for gloves to be worn at all times, the evidence indicates that gloves were not always worn. Tr. 62.

Respondent failed to rebut testimony that the cable was likely to be handled in the "cut loop," where the damage was located. Citation to *Consol Pa. Coal II* is therefore inapposite here, other than to assert that the Secretary must demonstrate exposure to the hazard. The record here clearly shows that the Secretary met her burden as to reasonable likelihood that a miner could contact the damaged portion of the cable while energized.

### 3. Step 3 – Contact with the damaged cable was reasonably likely to result in contact with a stray current escaping through the damaged area capable of injuring a miner.

I have already determined that miners were reasonably likely to contact the damaged portion of cable. *See supra* Section III.C.2.a. The remaining issue with respect to reasonable likelihood of injury is whether stray current was reasonably likely to escape from the trailing cable.

The crux of Respondent's argument against this likelihood is that the shielded cable is inherently safe, and that the severity and location of the damage was unlikely to allow the injury. Resp't Br. at 22-23 (arguing miners were unlikely to come into the damaged portion of the cable on the cut loop and that the cable's shielding "[m]ade the [o]ccurrence of an [e]lectrical [s]hock [h]azard [u]nlikely"). However, I find the Secretary proved the injury was reasonably likely to occur during continued, normal mining operations, and Respondent failed to demonstrate elimination of the risk.

#### a. The record shows that stray current sufficient to cause injury could escape from the damaged cable.

A cable with an electrical defect, such as a phase/ground short-circuit, creates a danger that electricity will not follow its planned, intended path in a complete, integrated circuit. When this occurs, other grounding mechanisms might divert some of the free electrons to ground, but electric current follows the path of least resistance to ground. Tr. 109-10.

Where the amperage is high, as here, the current will flow to ground in proportion to the paths made available to it. The copper ground wires have extremely low resistance. Tr. 109. But a human body may provide a path to ground. *See* Tr. 109 ("electric current will vary depending on the resistance of the body in which the electrons are flowing"); Tr. 202 (among other factors, "[t]he current flow of a human who came into contact with a fault in [a] cable would depend upon the resistance or dielectric strength of that person").

If the exterior insulation of the cable is damaged, electricity may escape containment and contact a miner handling the cable in the damaged area. Tr. 57. For this to happen, there must be a defect interrupting the normal power circuitry, such as a failure of the insulation surrounding the phase conductors.

Here, the penetration of the outer jacket is directly above one of the two large uninsulated ground wires inside the cable. These cables are intended to provide the best path to ground. But a miner who contacts the cable where the damage could allow the electricity inside to escape and contact the miner. Tr. 57.

The potential for this is greater if the cable is wet, and water is generally found in the area where the CM-201 miner was operating. *See* Tr. 55 (noting water is used to suppress dust when the continuous miner is in operation); Tr. 87 (noting "wet and damp" conditions); Tr. 311 ("damp environment is a possibility"). If the miner was not wearing gloves, as witnesses noted sometimes occurred (despite the operator's requirement that they be worn at all times), and if the miner's boots were damaged or the miner otherwise was not fully insulated against a path to ground, electricity could flow from the cable into the miner Tr. 57.

The amount of current needed to cause a fatal injury (as little as 100 milliamps) is significantly lower than the current carried by the cable. MSHA's witnesses testified credibly that a miner could be exposed to a risk of electric shock. Tr. 60. MSHA need not establish that a fatal injury was reasonably likely; it only needs to prove that there was a reasonable likelihood of a reasonably serious injury, which could include burns or other significant injuries. *See Consol Pa. Coal Co.*, 44 FMSHRC 182, 194 (March 2022) (ALJ) (finding electrical shock or buns to be a reasonably serious injury).

The operator suggests that the cable's integrity was confirmed by the Fluke testing device. Resp't Br. at 15-16. This is a flawed premise.

As an initial matter, I disagree with the Secretary's suggestion that the Fluke testing device was inadequate to the task of inspecting the electrical integrity of the cable. As noted at Slip Op. at 6, the total current is divided between the phase conductors and the total current present in the event of a short-circuit would not exceed 1,000 volts.

Therefore, I find the Fluke testing device, rated at 1,000 volts, was appropriate for the task here. In addition to the operator's witnesses credibly testifying about the capability of the device in these circumstances, *see* Tr. 348-356 (Grounds testifying about testing the cable with the Fluke testing device), documentary evidence about the device and its testing parameters show that the Fluke meter would have detected a short or other electrical problem in the cable, had one existed at the time of the test. *See* Ex. P-9.

That, though, is the problem. Having already determined that the interior inspection confirmed no present hazard of electric shock, the test results are essentially irrelevant. No witness or other evidence established that the device had any predictive value, and the only relevant period for an S&S assessment in this case is the future. The Fluke test therefore has no bearing on my decision about the potential for a hazard to arise in the course of continued normal mining operations. *See Consol Pa. Coal Co.*, 43 FMSHRC at 148 (stating S&S assumes continued normal mining operations, which suggests the relevant period is the future not the present).

**b. Respondent did not effectively demonstrate that the presence of shielded cable eliminates the risk of an electrical injury.**

The path to a serious injury here is admittedly not straight or direct. Lapses and failures of equipment and judgment must occur. Respondent argues that the presence of shielding around each inner conductor is an "inherent, engineered safety feature . . . that made the occurrence of an electrical shock hazard unlikely." Resp't Br. 23. It cited MSHA's shielded cable requirement and discussion of the benefits in support, but this analysis (1) fails to fully appreciate the language of the proposed rule and (2) essentially attempts to make any cable violation involving such shielding non-S&S.

First, Respondent provides,

> Metallic cable shielding . . . provide[s] *an engineering safeguard* for the protection of miners, which is a passive or "built-in" defense against shock and electrocution through contact with cable voltages. The Agency recognizes the advantage of engineering protection in some instances in addition to procedural safeguards that can be defeated by carelessness, mistake, lack of training or tampering. Cables which are properly shielded and maintained would *not* expose miners to the consequences of such human factors.

*Id.* at 24 (quoting *Electrical Safety Standards for Underground Coal Mines*, 54 Fed. Reg. 50,062, 50,087 (Dec. 4, 1989)) (emphasis in original). The first emphasized portion is in support of Respondent's contention that the shielding is not a redundant safety measure. *See id.* at 25 (citing Tr. 193). Even accepting that contention as true, a demonstration of damage to the shielding is sufficient to present a hazard. This is supported by the second emphasized portion. Respondent chose to highlight the word "not" to argue that shielded cables would not expose miners to the consequences of human failures. It should have instead noted the word "maintained." The cables must be shielded *and maintained* to not expose miners to the hazard.

"Maintain," in this context, is defined, "To care for (property) for purposes of operational productivity or appearance; to engage in *general repair and upkeep*." *Maintain*, BLACK'S LAW DICTIONARY (11th ed. 2019) (emphasis added). Coal mine regulations are replete with requirements to "maintain" equipment. *See e.g.*, 30 C.F.R. §§ 75.503 (requirement to "maintain in permissible condition all electric face equipment" required by other regulations in this subpart).

The evidence provided here showing damage and the likelihood of further degradation, is sufficient to demonstrate that the cable has not been properly maintained. *See* Tr. 131-32, 163, 311, 447. Since it is not shielded *and maintained*, Respondent cannot point to this to effectively argue the cable would not expose miners to the hazard.

Respondent continues,

> Although perfect compliance with all of MSHA's mandatory standards and the absence of human error are desirable, due to many varying circumstances, it would

> be unrealistic to assume such circumstances at all times. Therefore, the elimination of as many factors contributing to electrical injuries as possible *through shielding requirement* would lessen the risks to miners.

Resp't Br. at 24 (quoting 54 Fed. Reg. at 50,087) (emphasis in original). Note that the language says "lessen," not "eliminate." Taken together with the quoted language above, the proposed rule seems to contemplate that a maintained shielded cable would *lessen* the risks. But even if this type of cable presents a lesser risk of electrical injury, Respondent has not demonstrated contact with an energized cable at the point of damage is not reasonably likely to result in injury.

Respondent further notes, "Primarily, the use of shielded trailing cables would increase safety for miners required to physically handle the cables by reducing the likelihood of exposure to bare or short-circuited energized power conductors." *Id.* (quoting 54 Fed. Reg. at 50,088). Yet, this simply provides for reduced likelihood.

Finally, Respondent states, "If shielding had been present around the trailing cable power conductors, the leakage current would have been conducted to ground by the shielding, *eliminating* the shock hazard to the victim." *Id.* (quoting 54 Fed. Reg. at 50,088) (emphasis in original). This statement was in response to discussion of a fatality where an unshielded trailing cable was "damaged to the point of exposing conductors, but continue[d] to function properly." 54 Fed. Reg. at 50,088. The victim there was reportedly exposed to leakage current through "damaged and wet cable insulation." *Id.*

This informs us that if a phase lead's insulation is damaged (and wet), current will leak to the individual shielding and run to ground. But this statement does not account for damage to the shielding. As noted in Respondent's first quotation, the cable must also be *maintained* properly.

Respondent's own witnesses acknowledged that it is possible the shielding will not provide the intended safety if it is damaged. Tr. 328. *See* Tr. 548 (assuming shielding was not damaged at time of the "nail test"[10]); Tr. 566 ("If the shield were damaged to the point where it

[10] The "nail test" discussed is a test conducted by the Penn State Mine Electrical Research Laboratory as part of a series of investigations to examine the feasibility of shielding low-voltage trailing cables in underground coal mines. Ex. DD at Bates label -01070. These investigations were published 1979 in the U.S. Department of Interior, Bureau of Mines Information Circular titled "Mine Power Systems Research (In Four Parts) 1. Trailing Cables." *Id.* at Bates label -0167-68. The nail test involved driving a six-penny coated nail repeatedly into an energized SH-D shielded cable. *Id.* at Bates label -01074. The nail test was described performed as follows:

> An additional electrical test was devised to show the effects caused by a person using a metal object to penetrate an energized cable. To duplicate worst-case conditions, the ground-current-limiting resistor was eliminated from the circuit so that the current through the shield would be allowed to rise above 25 amperes.

was spread more than a quarter inch apart, and the insulation had cracked all the way through, it's possible at that time [such damage would increase the likelihood of being shocked]."); Tr. 571–72 ("In order for [the current] to get past [the shielding] and come out the outer rubber coating, that shielding would have to have a gap greater than this thickness [of the rubber outer jacket].").

The record demonstrates damage to the shielding. *See* Tr. 43, 128, 323. Therefore, given the damage, and the likely further degradation during continued normal operations, Respondent failed to demonstrate that the cable is inherently safe or even lessened the risk to miners.

Respondent goes on to assert the violation was not reasonably likely to cause a shock hazard even in a hypothetical worst-case scenario. Resp't Br. at 26. It states that such a finding requires a litany of assumptions. That theory is refuted by a review of the actual conditions upon which the supposed "assumptions" rest:

- That something causes further degradation of the inner phase lead insulation. Resp't Br. at 26. It is permissible to assume that further degradation will occur due to consistent dragging and bending in the harsh, underground environment during continued normal mining operations. *See* Tr. 131-32, 163, 311, 447. Even Respondent's witnesses acknowledged that "it's not going to heal itself," Tr. 518, and I give no credence to contentions that the damage was not likely to get worse. Tr. 363, 390, 394, 424, 447–48. *See contra* Tr. at 162–63, 190, 300, 447.
- That leaked current from damaged lead insulation contacts the shielding and flows to ground. Resp't Br. at 26. This is an assumption in Respondent's favor—that any stray current flows down the shielding rather than escaping the cable jacket to injure a miner. But this itself assumes no damage to the shielding, as discussed above.
- That ground fault protection fails to function. Resp't Br. at 27. This is a redundant safety measure and therefore precedentially irrelevant. *See Cumberland Coal Res., L.P. v.*

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> A 218-volt ac source was used to power two series-connected 100-watt electrical lights. One wire of the circuit was routed through a sample of flat SH-D cable from the test site. The six-penny nail was connected to a grounded 1,000-ohm resistor to simulate a worker, also under worst-case conditions. After the cable was energized, a remotely operated apparatus drove the nail into the cable.
>
> Ten trials were performed and in 9 out of 10, the current flowing through the shield was sufficient to trip a 20-ampere circuit breaker in approximately 5 cycles or 83 milliseconds. The test results were very repetitive for these nine trials; identical current levels were observed in each. Current flow through the worker was a harmless 2 milliamperes, while current flow through the shield was 1,800 milliamperes. During the nine trials, the shield sustained no noticeable damage. However, during one attempt, the breaker was not activated because the shield around the nail penetration area was destroyed.

*Id.* at Bates label -01075. *See also* Resp't Br. at 27 n.3 (describing the "nail test"); Tr. 206, 527-532 (discussing the "nail test").

*FMSHRC*, 717 F.3d 1020, 1029 (D.C. Cir. 2013). Also, the Secretary demonstrated that much less than the amperage required to trip the breaker would be sufficient to kill a miner, and a more potent charge could do so in the split-second before the breaker tripped. *See* Tr. 168, 171.[11]

- That the trailing cable's voltage limiting resistor fails to limit the voltage of the circuit. Resp't Br. at 27. This assumption fails to persuade for the same reason as the similarly-redundant ground-fault protection.
- That the damage, including the heat and smoke created, would not be detected. Resp't Br. at 27. This assumed miner precaution and abatement, both of which are precedentially irrelevant. *See Eagle Nest, Inc.*, 14 FMSHRC 1119, 1123 (July 1992); *see also Crimson Stone v. FMSHRC*, 198 Fed. Appx. 846, 851 (11th Cir. 2006) ("Any assumptions about how and when [the equipment] would have been repaired do not alter the [S&S] nature of the violation."); *Consolidation Coal Co.*, 35 FMSHRC 2326, 2337 (Aug. 2013).
- That something causes the damage (slit) to grow bigger. Resp't Br. at 27. This is already addressed by the assumption of further degradation during continued normal mining operations because witnesses testified credibly that this would happen.
- That a miner contacts the damaged portion simultaneously with the existence of the fault. Resp't Br. at 27. I have already found that miners are reasonably likely to contact this portion of the cable during continued normal mining operations. *See* Section *supra* III.C.2.a.
- That a miner contacting the circuit is not wearing gloves, or those gloves are wet. Resp't Br. at 27. *See Sec'y of Labor v. Consolidation Coal Co.*, 895 F.3d 113, 118 (D.C. Cir. 2018) (holding mitigating safety measures and expected miner precaution irrelevant to an S&S analysis); *see also Cumberland Coal Res., L.P. v. FMSHRC*, 717 F.3d at 1028–29. Also note that while witnesses disagreed about the amount of water in the area where the continuous miner operated, there was no question that there was *some* water in the area, so the cable, and thus the gloves of any miner handling it, would be reasonably likely to become wet at some point.[12]

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[11] Cody Christian testified that electrical flow would most likely contact the shielding, flow to the ground fault relay, and trip the breaker, and that such happens in milliseconds. *See* Tr. 521–22. This seems intended to enable Respondent to make the argument that injury is unlikely because a miner would have to contact the damaged portion of the cable at the exact moment of fault, and that the shielding would prevent the flow through the miner. *See* Resp't Br. 31–32. I already found that damaged shielding is not likely to provide such protection. *See* Slip Op. at 17. I have also found that it is reasonably likely that a miner could be holding or touching the damaged area in the course of normal operations. *See supra* Section III.C.2.a. That such a fault would happen quickly does not effectively challenge the reasonable likelihood of injury, because if the miner is holding the damaged area of the cable at that exact moment, a serious or fatal injury could occur.

[12] There is no need to make too much of this fact, given that the gloves would be a redundant safety measure depending on miner precaution – neither of which is legally cognizant in this context, but the gloves provided by the operator do not have an electrical rating. *See* Tr. 314 (the operator's compliance manager noting the gloves provided to miners do not have a

- That a miner contacting the circuit is not wearing electrically rated boots, or that those boots are damaged. Resp't Br. at 27. Boots, like gloves as explained above, are irrelevant to whether an injury is likely to occur in an S&S analysis, because they shift the analysis from the engineering controls required by the mandatory standard to miner precaution and redundant safety measures. *See Spartan Mining Co.*, 30 FMSHRC at 707 (noting Congress' concern for particular dangers posed by damage to trailing cables and dismissing argument that circuit breaker – which did not prevent fatal injury in *Spartan* – or other redundant safety measures as effective prevention against reasonably likely injury from damaged cable).

Respondent further asserted that, given the assumed worst-case scenario, a miner would still only be exposed to 5 milliamps—sufficient to create only muscle spasms. *See* Resp't Br. at 27 (citing Tr. 528–35).[13] Respondent pointed to an absence of evidence of past incidence of shock from handling shielded cables and cited a 1985 ALJ decision regarding alleged cable damage to argue that the S&S citation should be vacated. *Id.* at 28 (citing *Arch of Ill., Inc.*, 7 FMSHRC 56, 88 (Jan. 1985) (ALJ) ("[R]espondent's evidence and testimony establishes that the construction and shielding of the cables provided more than adequate protection against any damage from the rubber-tired equipment which ran over them."). This case is not helpful to Respondent here because it involves a different standard and distinguishable factual findings regarding cable damage.

In *Arch of Illinois, Inc.*, the two citations involved a failure to adequately protect trailing cables from damage by mobile equipment—30 C.F.R. § 77.604. 7 FMSHRC at 58–59, 61, 88. The judge's decision was based on the fact that any damage was unlikely from the rubber-tired vehicles shown to have run over, or likely to run over, the cable. *Id.* at 88.

The standard at issue here is section 75.517, which involves a failure to adequately insulate a trailing cable. The standard in *Arch of Illinois, Inc.* is therefore based on exposure to possible damage from vehicles, whereas the standard here is based on actual damage to the cable.

Importantly, the record in *Arch of Illinois, Inc.* demonstrated "no signs of any internal or electrical damages." *Id.* at 86–87. The judge's finding that damage from the types of vehicles present was unlikely also noted that "the evidence establishes that no damages occurred." *Id.* at 88.

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manufacturer-listed electrical rating); Ex. O. (specification sheet for PosiGrip Gloves Style 720DGU provided by the operator listing no electrical rating).

[13] I note that Respondent included this argument in Step 2—analysis of likelihood of occurrence of the hazard. As I have stated that the hazard is miner contact with an energized, damaged cable, discussion of the amount of available amperage to which a miner is likely to be exposed relates to the likelihood of injury caused by such contact. Here, Respondent asserts the likely amperage is only sufficient to cause muscle spasms, and that it is unlikely to cause injury—e.g., shock, burns, or electrocution.

The facts here are demonstrably different. Here, there was damage to the cable, and the type of vehicle was acknowledged to be capable of damaging the cable, *see* Tr. 330–31 (demonstrating that a continuous miner had "trammed over its own cable" and caused damage in the past); *see also* Ex. PP (citation for an incident where another continuous miner cable at Lively Grove Mine was found "with tire tracks on it for approximately 20 feet and had been pushed into the ground" after being run over by another type of vehicle), unlike the rubber-tired vehicles in *Arch of Illinois, Inc.*

Additionally, Respondent's own expert, after citing the "nail test" to state that minimal amperage would flow through a miner, stated that he "certainly would not" grab a nail driven into a live cable "[u]nless [he] was feeling extremely daring," Tr, at 549-50. He later qualified that he "would not take a nail underground and advise someone to grab [it]." Tr. 551. This seems to at least acknowledge that the conditions underground might make the risk of current escaping from shielded cable different than in a controlled lab setting.

Even accepting the validity of the "nail test" —although conducted at a lower current and with undamaged shielding—the testimony on the record demonstrates that the risk of injury from escaping electrical current is still present, especially in underground mining conditions. The Secretary has shown likely injury from contact with electrical current, and this Court acknowledges the dangers of serious injury from contact with inadequately protected cables. *See F & F Mendisco Mining Co.*, 4 FMSHRC 897, 898 (May 1982) (ALJ) (involving the death of a miner from contact with a bad splice while climbing down into a sump). Respondent's proffered evidence is insufficient to counter the obvious grave danger of electrical injuries.

**c. Respondent did not rebut evidence demonstrating that the severity and location of the damage made current leakage reasonably likely.**

Respondent's witnesses testified that the severity was insufficient to permit current leakage, and that the location of the damage did not provide a pathway for such leakage. Respondent's expert, Christian, testified, "If the shield were damaged to the point where it was spread more than a quarter inch apart and the insulation had cracked all the way through, it's possible at that time [that the likelihood of shock would be increased]." Tr. 566.[14] He later specified that such an increase created by a quarter-inch damage would be present if the holes—those in the shielding and that in the outer jacket—were lined up. Tr. 581.

[14] He later specified, "In order for [electricity] to get past the shielding and come out the outer rubber coating, that shielding would have to have a gap greater than this thickness [of the rubber outer jacket]." *Id.* at 571–72.

Bryce Jones, Respondent's maintenance technician, testified that the cracked phase insulation was a half-inch away from the outer cable damage. Tr. 365. Garrett, Respondent's "dust tag,"[15] testified that the hole in the outer jacket was over the ground lead. Tr. 417.[16]

Respondent therefore attempted to demonstrate that the damage would have to be greater, and the location would have to be directly over a phase lead. These assertions directly contradict both the requirement to assume continued normal mining operation, the spirit of the Commission's *U.S. Steel* decision, and the nature of electrical current if the insulation fails to contain the current within the phase leads.

I cannot assume that the damage would have been found and remedied, and I have already found that further degradation of the existing damage—to the outer jacket, the shielding, and phase lead insulation—is reasonably likely during continued operations. Respondent's proffered testimony therefore does not adequately challenge a demonstration that the violation is reasonably likely to degrade and expose miners to contact with inadequately insulated cable.

Acknowledging the significant risks from electricity and damaged cables, the Commission in *U.S.* Steel affirmed a finding that "both the outer and inner layers of insulation provided important protection against electrical shock." 6 FMSHRC at 1575. Respondent here would have the Commission believe that the existence of individual lead shielding negates the likelihood of such a contemplated injury.

I find, however, that the analysis in *U.S. Steel* continues to be perfectly applicable. In that case, there was no visible damage to the live power wire insulation, and both parties agreed that "because the power wires remained individually insulated at the time of inspection there was no immediate danger of electrical shock even if a miner should inadvertently grab the cable." *Id.* at 1573. Yet, the Commission still found that the existence of outer jacket damage and likely degradation from mining operations was sufficient to justify the S&S finding. *Id.* at 1575.

Accepting the existence of a third layer of protection, the *U.S. Steel* logic still ends in a finding that the "outer and inner layers [both individual phase insulation and shielding]" provide the contemplated protection. *Id.* And if I assume continued degradation due to the "relevant dynamics of the mining environment or processes," *id.* at 1574, then demonstrated damage to the outer jacket, the shielding, and the phase insulation is sufficient to support an S&S finding.

[15] As "dust tag," Garrett was responsible for dealing with dust samples taken at the mine. Resp't Br. at 4 (citing Tr. 403-04).

[16] The actual jacket provided as an exhibit shows the impression made by the uninsulated cable where the hole pierced the jacket, so this fact is beyond dispute. *See* Ex. P-7.

**d. Respondent's argument that the standard use of safety equipment precludes an S&S finding runs counter to Commission and Circuit Court precedent and is contrary to record evidence demonstrating less than full compliance and likely equipment degradation.**

Respondent directly challenges Commission and Circuit Court precedent regarding assumed abatement and redundant safety measures. *See* Resp't Br. at 18, 18 n.1, 29–30. It first argues that it is "just conjecture, speculation, and worst-case hypotheticals," *id.* at 18, to assume that normal practices that are part of continued normal mining operations would not occur, and that a finding of violation would be error. *Id.* at 18 n.1.

Respondent points out that it provided evidence of preoperational checks, weekly permissibility checks, and examples of identified and corrected cable damage. *Id.* at 18 n.1. But this argument is foreclosed by law. Simply put, the Commission will not assume abatement of the violation in an S&S analysis, unless the abatement is underway when the violation is discovered. *Mach Mining, LLC,* 40 FMSHRC 1, 6 (Jan. 2018), *aff'd*, 748 Fed. Appx. 357, No. 2019 WL 275718 (D.C. Cir. 2019) (internal citations omitted).

There was no active abatement here. Respondent therefore may not rely on such evidence to argue that a reasonable likelihood of discovery would have made it unlikely that the defect would cause the hazard to materialize.

Next, it argues that normal practices—e.g., all miners always wearing gloves and boots while underground—should be considered part of continued normal mining operations. Resp't Br. at 29–30. As with an assumption of abatement, the Commission will not consider such circumstances (or practices) external to a violation to reduce the likelihood that harm will occur.

I accept that the shielding is not a redundant safety measure but an integrated part of the protection and insulation provided in accordance with the standard. But the use of personal protective equipment ("PPE") is external to, and thus not relevant in considering, the hazard created by the operator's non-compliance. *See Cumberland Coal Res., L.P. v. FMSHRC,* 717 F.3d at 1029 (D.C. Cir. 2013) (*citing Sec'y of Labor v. FMSHRC*, 111 F.3d 913, 917 (D.C. Cir. 1997) ("By focusing the decisionmaker's attention on 'such violation' and its 'nature,' Congress has plainly excluded consideration of surrounding conditions that do not violate health and safety standards."). Even if I were to accept the use of rated gloves and boots in an S&S analysis, Respondent's own witnesses failed to demonstrate a reasonable likelihood of perfect use and integrity of such protection.

Respondent went to great lengths to develop testimony that gloves and boots are always used underground, and that it makes them available to all miners. Tr. 103–04, 108, 292, 285–96, 369. First, Grounds, Respondent's compliance manager, acknowledged, "I can't say that it's 100 percent compliant, but it is information that is shared with our employees, and I do believe that the majority of employees, if not -- if not most or all do comply." Tr. 290. Therefore, the risk of contacting a damaged cable with unprotected hands or feet is not eliminated by protective equipment used by miners.

Next, the Secretary effectively rebutted the availability of fully protective boots and protective gloves at all times. Grounds acknowledged that he did not know the dielectric rating of the gloves provided in the free vending machine. Tr. 314. He further admitted there was no way to tell if miners' gloves would always be dry during continued operations. Tr. 313. While the mine has a boot policy that seems designed to ensure miners will have safe, protective footwear, the policy only allows for reimbursement of one pair per year. Tr. 315-16; Ex. GG. Cut or damaged boots could be compromised, though the mine does have rubber boots available. Tr. 314–17.

Both Jones and Whitfield conceded that damaged or wet gloves could happen at any time. Tr. 235, 395. Inspector Tisdale acknowledged the PPE policy, but he referenced an incident at the mine where a supervisor put a bare hand on a cable while talking to an MSHA inspector. Tr. 104.

Even considering redundant safety measures, Respondent thus did not demonstrate that the cited PPE was always worn, was always available, or that it continuously maintained the integrity necessary to provide the expected protection. Respondent's assertions in this vein do not reduce the likelihood of injury.

**4. Step 4 – The injury from exposure to stray current from the damaged CM-201 cable was reasonably likely to be of a reasonably serious nature**

The final step in determining whether the violation was significant and substantial is whether there is a reasonable likelihood that the injury in question is of a reasonably serious nature.

The injury from electrical shock is directly related to the amount of current to which a person is exposed. Inspector Tisdale and Special Investigator Whitfield testified that a fatal injury could result from exposure to as little as 100 milliamps of electricity. Tr. 59-60, 167-68. This testimony was essentially undisputed. *See* Tr. 534 (Respondent's expert Christian stating the same).

The CM-201 cable is a 995-volt cable with a current of up to 200 amps coursing through it when it is energized. Tr. 59-60. This is well above the lethal limit. However, the system is equipped with a fault relay that triggers at six amps or seven amps. Tr. 168. If the insulation on a phase conductor is breached, electricity would flow from the phase to the shielding and trip the main fault relay within milliseconds, cutting of the power. *See* Tr. 59, 523.

The evidence demonstrates that it is possible for a miner to be shocked with a lethal current of electricity, even if the circuit breaker functioned properly. Under one such scenario, the inner phase insulation would have to be completely breached by subsequent stress or damage, at the precise moment when a miner is handling the cable and in contact with the splice.

Under a second scenario, it is alternatively possible that the conductor's insulation might be degraded to permit a current less than six amps to escape the conductor. I infer from Christian's testimony that as the insulation would wear and become thinner, it could begin to

allow leakage of some current from the phase conductor. Gradual failure of the insulation, as stress and wear reduced its thickness, would progressively allow more current to leak from the insulation.

Even without a complete breach, wear to the thickness of the inner conductor's insulation could cause the leaking electricity to increase above the potentially fatal 100 milliamps, before reaching the six or seven amps necessary to trigger the circuit breaker. In that range, the breaker would not be triggered, but a miner holding the cable at the damaged area could be exposed to a serious, and perhaps fatal, electric current.

Six amps is more than 60 times the electric current sufficient to cause a fatality. Under these circumstances, it is therefore reasonably likely that injury from exposure to the current could range from serious to fatal.

Respondent argues that the electrical current that could escape the hole in the outer jacket is insufficient to cause serious injury. Based on the results of the "nail test", Christian analyzed and estimated the maximum amount of current a person would be exposed to under the conditions present in this matter. Tr. 520-39.

He testified that even assuming a worst-case scenario where a miner comes into contact with the cited 1/4 inch slit in the cable's outer jacket at the precise moment a fault occurs inside the cable, any stray current that might have leaked out would have been no more than approximately five milliamps. Tr. 533-534. This would be enough to cause a tingling sensation but not enough to cause an injury or a reasonably serious nature. Tr. 534.

As I have discussed above — *see supra* Section III.C.3.b. — the testimony on the record demonstrates that the risk of injury from escaping electrical current is still present, especially in underground mining conditions. Respondent's own expert, after citing the "nail test" as support for his belief that minimal amperage would flow through a miner, stated that he would not personally risk touching an energized cable under the test conditions, nor would he advise anyone to grab the cable. Tr. 549-51. This seems to at least acknowledge that the conditions underground might make the risk of current escaping from shielded cable different than in a controlled lab setting.

I find that the results of the "nail test" cannot be reliably applied to the facts of this case. The laboratory conditions of the test are not analogous to the conditions of a cable being dragged across the floor of an underground coal mine. Moreover, the "nail test" fails to consider any damage to the wire shielding, but assumes the shielding is fully intact. The shielding inside the CM-201 cable was damaged, and thus was subject to further degradation as the cable was used.

To establish S&S, the Secretary does not need to prove the reasonable likelihood of a fatal injury, but only reasonably serious injury, which could include burns or severe electric shock. *See Consol Pa. Coal Co.*, 44 FMSHRC at 194 (finding the third and fourth steps of the S&S analysis was met when a damaged cable was "reasonably likely to cause electrocution and injuries such as electrical shock, burns, or death"). Therefore, given the high amount of current in the CM-201 cable and that the circuit break only triggers at six amps, which is well above the

100 milliamps threshold for a fatal injury, I find that Secretary has established that exposure to stray current from a damaged cable was reasonably likely to be of a reasonably serious nature.

The Commission has upheld an S&S violation where only the outer cable has been shown to have been damaged. *See Harlan Cumberland Coal Co.*, 20 FMSHRC 1275, 1288 (Dec. 1988) (affirming ALJ's crediting inspector's testimony about injury and determination that outer damage to insulation was sufficient because of potential "invisible" damage to insulation around inner conductors and noting that "even a pinhole-sized breach can conduct enough current to electrocute a miner."). The Commission in *Harlan* further noted that "[t]he judge's conclusion is bolstered by the presence of water and the high frequency with which the cable was manually handled during normal mining operations." *Id.*

I therefore find that the violation here is significant and substantial, based on similar evidence. Respondents violated the mandatory safety standard of 30 C.F.R. § 75.517. The violation was reasonably likely to result in a miner coming into contact with the damaged portion of the cable while energized.

This contact with the damaged cable is reasonably likely to result in a stray current capable of injuring a miner escaping through the damaged area. The resulting injury is reasonably likely to be of sufficient amperage to cause a serious electric shock or electrocution. This conclusion of a risk of reasonably serious injury is increased by the fact that, like in *Harlan*, the cable in question is handled by miners in the presence of water and sometimes wet and damp conditions. Therefore, I affirm the Secretary's S&S finding.

**D. Penalty**

While this is an S&S violation, I have held that the operator's negligence is not as severe as the Secretary alleges. Furthermore, the damage to the cable was minimal. Aggravating its diminishment of the cable's insulation could require a serious subsequent injury or a prolonged period of repetitive stress.

While redundant safety measures and miner precaution may not negate an S&S finding, I do credit the operator's proactive safety measures here. The operator provides gloves to miners. These gloves are not dielectrically rated, but witnesses said they could provide some protection if not wet or damaged. Additionally, the operator pays for a pair of boots for each miner, once a year, and requires that safety equipment be worn.

Not crediting the operator for these measures ignores their contribution to health and safety at the mine. While the violation is serious enough to compel its correction before any possibility of harm could arise, a reasonable person would understand that these measures may greatly reduce the hazard by making it much less likely that a miner could provide a path to ground for uncontrolled electrical current.

The size of the operator and its violation history are essentially uncontested. Tr. 471-73; Ex. P-3. The operator has stipulated that the penalty proposed by the Secretary would not interfere with its ability to remain in business, and the Secretary's proposed penalty credited the

operator with rapid good-faith abatement of the citation. Tr. 471-73; Ex. C. Considering the gravity posed by the hazard and the and lesser negligence supported by the record, and all the factors set forth in Section 110(i) of the Act, I assess a penalty of $1,800.

## IV. CONCLUSION

For the reasons set forth above, I find that the operator violated 30 C.F.R. §75.517 as a result of its low negligence and that the violation was S&S. The operator is **ORDERED** to pay $1,800.00 within 30 days of this decision.[17]

Michael G. Young
Administrative Law Judge

Distribution:

Edward V. Hartman, Esq., Office of the Solicitor, U.S. Department of Labor, 230 S. Dearborn, Rm. 844, Chicago, IL 60604, hartman.edward.v@dol.gov

Jason W. Hardin, Esq., FABIAN VANCOTT, 215 S. State Street, Suite 1200, Salt Lake City, UT 84111, jhardin@fabianvancott.com

Artemis D. Vamianakis, Esq., FABIAN VANCOTT, 215 S. State Street, Suite 1200, Salt Lake City, UT 84111, avamianakis@fabianvancott.com

[17] Please pay penalties electronically at Pay.Gov, a service of the U.S. Department of the Treasury, at https://www.pay.gov/public/form/start/67564508. Alternatively, send payment (check or money order) to: U.S. Department of Treasury, Mine Safety and Health Administration, P.O. Box 790390, St. Louis, MO 63179-0390. Please include Docket and A.C. Numbers.