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MSHA V. AMAX CHEMICAL
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FMSHRC-WDC
AUG 27, 1986

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

v. Docket No. CENT 84-91-M

AMAX CHEMICAL COMPANY

BEFORE: Ford, Chairman; Backley, Doyle, Lastowka and Nelson,
Commissioners

DECISION

BY THE COMMISSION:

In this civil penalty proceeding arising under the Federal Mine Safety and Health Act of 1977, 30 U.S.C. § 801 et seq. (1982), Commission Administrative Law Judge Gary Melick concluded that Amax Chemical Company ("Amax") violated 30 C.F.R. § 57.3-22 (1984) by failing to provide adequate support for loose ground (roof). 1/ 7 FMSHRC 447 (March 1985) (ALJ). We granted Amax's petition for discretionary review and heard oral argument. On the bases that follow, we affirm.

1/ This mandatory ground control safety standard, which applies to metal-nonmetal underground mines, provides:

Miners shall examine and test the back, face, and rib of their working places at the beginning of each shift and frequently thereafter. Supervisors shall examine the ground conditions during daily visits to insure that proper testing and ground control practices are being followed. Loose ground shall be taken down or adequately supported before any other work is done. Ground conditions along haulageways and travelways shall be examined periodically and scaled or supported as necessary.

30 C.F.R. § 57.3-2- (1984) (emphasis added). In 1985, this provision was renumbered as 30 C.F.R. § 57.3022 but its wording was not changed.

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Amax operates an underground potash mine and surface preparation mill located in Eddy County, New Mexico. The mine's ore is composed of potash and sodium chloride (salt) and contains seams of clay, mud, and carnallite. 2/ On June 19, 1984, Clyde E. Bays, an inspector of the Department of Labor's Mine Safety and Health Administration ("MSHA"), conducted an inspection of Amax's mine. In the shuttle car unloading area Inspector Bays observed an area of roof 15-feet by 8-feet in which a crack or separation was visible. Eight to ten roof bolts had been installed around the visible crack. Inspector Bays proceeded to sound the roof with his hammer. The inspector testified that when a solid roof is sounded a clear ringing sound is generally produced but that if there is "some separation in the strata" of the immediate roof a dull, "drummy" sound is heard. Tr. 27-28. 3/ When Inspector Bays sounded the area in question, he encountered a drummy, "dull thud" sound. Because of the presence of the visible crack and the results of his sounding test, the inspector believed that the roof was loose and inadequately supported and issued the subject citation alleging a violation of section 57.3-22. The inspector designated the alleged roof control violation as "significant and substantial." 30 U.S.C. § 814(d)(1).

The citation was terminated after Amax installed six additional roof bolts in the cited area. After installation of those bolts, Inspector Bays again tested the roof and found that it no longer sounded drummy.

At the hearing before Judge Melick, Amax's general mine superintendent, Robert Kirby, acknowledged that a drummy sound suggests that there is a separation at some point above the ceiling. He stated, however, that this does not necessarily mean that the material is loose and will fall. Kirby testified that the practice at Amax was to install roof bolts in drummy-sounding areas as insurance against roof falls. Kirby conceded on cross-examination that, despite his past experience in the mine, he is unable to determine with absolute certainty whether a drummy area will fall. S.K. Desai, Amax's production superintendent, testified that drummy-sounding roof is evidence of either a physical separation in the roof strata or loosened adhesion between the strata because of the presence of carnallite or mud seams. Desai testified that when carnallite comes in contact with salt it will produce a drummy sound when tapped. He further stated that the presence of carnallite poses the same hazard as separation in the seams and the material could fall.

2/ Carnallite is a massive, granular, greasy, milk-white, soluble, hydrous magnesium-potassium chloride. Bureau of Mines, U.S. Department of Interior, A Dictionary of Mining, Mineral and Related Terms 177 (1968) ("DMMRT").

3/ Drummy is defined as, "[1]oose coal or rock that produces a hollow, loose, open, weak, or dangerous sound when tapped with any hard substance to test condition of strata; said especially of a mine roof." DMMRT 356.

In affirming the citation, the judge seemed to indicate that the critical issue was whether drummy-sounding roof alone is sufficient to support a finding that ground is loose and inadequately supported within the meaning of section 57.3-22. 7 FMSHRC at 448-49. The judge relied in part on the testimony of Desai that "drummy sounding roof is evidence of either a physical separation in the roof strata or loosened adhesion between the strata resulting from the presence of carnallite or mud seams." 7 FMSHRC at 449. The judge determined that even using Amax's "definition of 'loose' as 'not rigidly fastened, or securely attached' or as 'loosely cemented ... material,'" the cited drummy roof was loose and required additional support. 7 FMSHRC at 449. Accordingly, the judge found a violation. He further concluded that the evidence was insufficient to establish a "significant and substantial" violation within the meaning of section 104(d)(1) of the Act, as no effort had been made by the MSHA inspector to bar down the area around the fracture. 7 FMSHRC at 450. 4/ The judge assessed a \$50.00 civil penalty.

We conclude that substantial evidence supports the judge's finding of a violation in this particular instance but, on the present record, we disavow any implication in the judge's decision that the presence of drummy-sounding roof (back) in a metal-nonmetal mine always signifies "loose" ground within the meaning of the standard.

Section 57.3-22 requires in pertinent part: "Loose ground shall be taken down or adequately supported before any other work is done." (Emphasis added). In light of the arguments advanced in this case, we emphasize at the outset that this standard does not provide that "drummy" ground be taken down or adequately supported but rather requires that "loose ground" be taken down or supported. "Loose ground" is not defined in the standard, and we therefore turn to the commonly accepted meanings of the term.

Both the Secretary and Amax note that "loose" is defined as "not rigidly fastened or securely attached." Webster's Third World New International Dictionary (Unabridged) 1335 (1966). The term "loose ground" has a specific meaning within the mining industry and is defined as "[b]roken, fragmented, or loosely cemented bedrock material that tends to slough from sidewalls into a borehole. ... As used by miners, rock that must be barred down to make an underground workplace safe...." DMMRT 658. Accordingly, the term loose ground, as used in this standard, refers generally to material in the roof (back), face, or ribs that is not rigidly fastened or securely attached and thus presents some danger of falling.

While this definition is generally useful, the crux of the matter is how it is determined that ground is, in fact, loose within the meaning of section 57.3-22. As discussed in recognized texts, practical roof testing is not yet a precise science served by a sophisticated technology.

4/ The Secretary did not seek review of the judge's finding that the violation was not "significant and substantial."

See e.g., S.M. Cassidy (ed.), *Elements of Practical Coal Mining* 76-77 (1973). Certainly, a major means of detecting loose roof is the one employed by the inspector in this matter: the sound-and-vibration method, which is a simple test involving tapping the roof with a hammer. Generally, loose roof will give off a dull, hollow, drummy sound as compared with the solid ring of firm roof. While a drummy sound is generally an indication of loose roof, circumstances may be present in which the sound-and-vibration test is not reliable. See e.g., Cassidy, *id.*, at 77. We note the concession of Inspector Bay, that there are instances when a drummy sound is produced during testing but the roof is not, in fact, loose. Tr. 64-65.

In this regard, it bears emphasis that Amax's mine is a potash mine. Unlike the regulatory scheme that obtains with respect to underground coal mines, approved roof control plans are not required in underground metal-nonmetal mining operations. Rather, "[g]round support shall be used if the operating experience of the mine, or any particular area of the mine, indicates that it is required." (30 C.F.R. §57.3020 (1985) (formerly numbered as 30 C.F.R. § 57.3-20 (1984)). See generally, *White Pine Copper Div., Copper Range Co.*, 5 FMSHRC 825, 835-37 (May 1983). (Of course, the standard involved in the present case also imposes the continuing duty to examine ground conditions in such mines and to take down or adequately support any loose ground.)

In view of the distinctive nature of ground control in metal-nonmetal mines and the uncertainties that may be involved in any particular sound-and-vibration test, and on the basis of the present record, a per se rule equating drumminess with loose ground in underground metal-nonmetal mines cannot be endorsed. Rather, we hold that in evaluating ground conditions and the adequacy of support under this standard, all relevant factors and circumstances must be taken into account. The result of a sounding test is an important factor, but is not necessarily dispositive. The size of the drummy area and other possible explanations for the drumminess must also be considered. Visible fractures, sloughed material, "popping" and "snapping" sounds in the ground, the presence, if any, of roof support, and the operating experience of the mine or any of its particular areas, are also relevant factors to be considered. Cf. *White Pine*, *supra*, 5 FMSHRC at 833-37.

In the present case, we conclude that substantial evidence, which includes but is not limited to the inspector's sounding test, supports the judge's finding that the cited ground was loose. Here, the inspector carefully examined the area of roof in question. His attention was engaged first by the presence of a clearly visible crack surrounded by 8 to 10 previously installed roof bolts. A fracture often signifies loose roof, and Amax's previous bolting efforts indicated some level of concern by the operator itself. As noted, the inspector's sound test produced a drummy sound despite the existing bolting. The testimony of production superintendent Desai regarding ground conditions in Amax's mine lends

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corroborative support to the inspector's belief that the cited area was loose. As noted, Desai testified that drummy-sounding roof is evidence of either a physical separation in the roof strata or loosened adhesion between the strata because of the presence of carnallite or mud seams. Desai also testified that carnallite poses the same hazard as does separation in the seams. Although Amax correctly contends that its operating experience must also be considered, we discern no persuasive reason on this record to challenge the inspector's informed judgment or to overturn the judge's finding that the roof was loose. 5/

5/ We reject any suggestion that the ground control measures required by the standard apply only when ground is in immediate danger of falling. The standard contains no such qualification. If an operator disagrees with an inspector's determination that the ground is loose, it can attempt to demonstrate the soundness of the ground by barring the area in question. Tr. 68. The operator also can point to the operating history of the mine and any other relevant factors tending to show that the ground is not loose. Here, rather than barring the area in question Amax installed additional roof bolts. However, as the facts of this case show the fact that roof bolts have previously been installed does not guarantee compliance with the standard. The standard requires not just support but adequate support.

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On the foregoing bases, the judge's decision is affirmed.

Ford B. Ford, Chairman

Richard V. Backley, Commissioner

Joyce A. Doyle, Commissioner

James A. Lastowka, Commissioner

L. Clair Nelson, Commissioner

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