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Federal Mine Safety and Health Review Commission  
Office of Administrative Law Judges

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

CIVIL PENALTY PROCEEDING

Docket No. WEST 86-1-M  
A.C. No. 05-03143-05511

v.

Parachute Creek Mine

UNION OIL COMPANY OF CALIFORNIA,  
RESPONDENT

DECISION

Appearances: Margaret A. Miller, Esq., Office of the Solicitor,  
Petitioner;  
Anthony D. Weber, Esq., Union Oil Company of California,  
Los Angeles, California, for Respondent.

Before: Judge Lasher

This proceeding was initiated by the filing of a petition for assessment of a civil penalty ("Proposal for Penalty") by the Secretary of Labor (herein the Secretary) on November 15, 1985, pursuant to Section 110 of the Federal Mine Safety and Health Act of 1977, 30 U.S.C. Section 820 (1977) (herein the Act). A hearing on the merits was held in Denver, Colorado, on June 25, 1986, at which both parties were represented by counsel. Subsequent to the hearing the presiding administrative law judge, John A. Carlson, passed away and by Order of Assignment dated October 17, 1986, this matter came on the docket of the undersigned for decision.

The Secretary charges Respondent with one violation, i.e., violating 30 C.F.R. 57.5001/5005 as described in Citation No. 2355268 issued by MSHA Inspector Michael T. Dennehy on May 115, 1985, as follows:

"On May 15, 1985, a Union Oil Company employee welding underground at the secondary crusher area was over exposed to welding fumes (Vanadium) while applying hard surfacing welding rods (nickel-chrome manganese and Vanadium-carbide) to the crusher. The welder was exposed to .0678 mg/M3 of Vandium fume whereas Vanadium fume has a ceiling limit of .05 mg/M3 and should not be exceeded. Personal respiratory protection was not being worn by the employee while he was

welding nor was the ventilation fan operating the entire shift. Analytical results were received June 7, 1985. This citation is issued June 27, 1985. The samples were taken May 15, 1985."

The subject 104(a) Citation further charges that the violation was "significant and substantial" (herein "S & S") (FOOTNOTE 1.)

Insofar as relevant, the air quality standard allegedly infringed, 30 C.F.R. 57.5001, which sets forth exposure limits for airborne contaminants, provides:

"Except as permitted by 57.5005 - (a) Except as provided in paragraph (b), the exposure to airborne contaminants shall not exceed, on the basis of a time weighted average, the threshold limit values adopted by the American Conference of Governmental Industrial Hygienists, as set forth and explained in the 1973 edition of the Conference's publication, entitled "TLV's Threshold Limit Values for Chemical Substances in Workroom Air Adopted by ACGIH for 1973," pages 1 through 54, which are hereby incorporated by reference and made a part hereof. This publication may be obtained from the American Conference of Governmental Industrial Hygienists by writing to the Secretary-Treasurer, P.O. Box 1937, Cincinnati, Ohio 45201, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration. Excursions above the listed thresholds shall not be of a greater magnitude than is characterized as permissible by the Conference.

\* \* \* \* \*

(c) Employees shall be withdrawn from areas where there is present an airborne contaminant given a "C" designation by the Conference and the concentration exceeds the threshold limit value listed for that contaminant." (FOOTNOTE 2)

The pertinent TLVs referred to in 30 C.F.R. 57.5001 provide as follows:

"Substance	ppm a)	mg/M3 b)
Vanadium (V205), as V		
Dust .....	ÄÄÄ	0.5 C
Fume .....	ÄÄÄ	0.05

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- a) Parts of vapor or gas per million parts of contaminated air by volume at 25C and 760 mm. Hg. pressure.
- b) Approximate milligrams of substance per cubic meter of air." (FOOTNOTE 3)

30 C.F.R. 57.5005, entitled "Control of exposure to airborne contaminants", also cited by the issuing Inspector, provides:

Control of employee exposure to harmful airborne contaminants shall be, insofar as feasible, by prevention of contamination, removal by exhaust ventilation, or by dilution with uncontaminated air. However, where accepted engineering control measures have not been developed or when necessary by the nature of work involved (for example, while establishing controls or occasional entry into hazardous atmospheres to perform maintenance or investigation), employees may work for reasonable periods of time in concentrations of airborne contaminants exceeding permissible levels if they are protected by appropriate respiratory protective equipment. Whenever respiratory protective equipment is used a program for selection, maintenance, training, fitting, supervision, cleaning, and use shall meet the following minimum requirements:

- (a) Mine Safety and Health Administration approved respirators which are applicable and suitable for the purpose intended shall be furnished, and employees shall use the protective equipment in accordance with training and instruction.
- (b) A respirator program consistent with the requirements of ANSI Z88.2-1969, published by the American National Standards Institute and entitled "American National Standards Practices for Respiratory Protection ANSI Z88.2-1969," approved August 11, 1969, which is hereby incorporated by reference and made a part hereof. This publication may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y., 10018, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

(c) When respiratory protection is used in atmospheres immediately harmful to life, the presence of at least one other person with backup equipment and rescue capability shall be required in the event of failure of the respiratory equipment.

In general aid of the record, the dictionary definitions of these two terms are set forth here. Thus, vanadium and vanadium pentoxide are described in "A Dictionary of Mining, Mineral and Related Terms" (compiled and edited by Paul W. Thrush and the Staff of the Bureau of Mines, U.S. Department of the Interior, 1968), as follows:

Vanadium. A gray or white, malleable, ductile, polyvalent metallic element in group V of the periodic system. It is resistant to air, sea water, alkalies, and reducing acids except hydrofluoric acid. It occurs widely but mainly in small quantities in combination in minerals (such as vanadinite, patronite, carnotite, and roscoelite), in the ashes of many plants, in coals, in petroleum, and in asphalts. Usually obtained in the form of ferrovanadium or other alloys, or in almost pure metallic form containing small amounts of oxygen, carbon, or nitrogen by the reduction of ores, slags, or vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>). Used chiefly in vanadium steel. Symbol, V; atomic number, 23; and atomic weight, 50.942. Webster 3d; Handbook of Chemistry and Physics, 45th ed., 1964, pp. B-2, B-143.

Vanadium pentoxide. Yellow to red; orthorhombic; V<sub>2</sub>O<sub>5</sub>; molecular weight, 181.88; specific gravity, 3.357 (at 18 C); toxic; melting point, 690 C; decomposes at 1,750 C before reaching a boiling point; slightly soluble in water; soluble in acids and in alkalies; and insoluble in absolute alcohol. Used in ceramics and as a catalyst. Handbook of Chemistry and Physics, 45th ed., 1964, pp. B-144, B-236.

As noted in the foregoing, and as reflected in the TLVs, V is the symbol for vanadium and V<sub>2</sub>O<sub>5</sub> is the symbol for vanadium pentoxide.

#### Preliminary Findings and Conclusions

While the form of Vanadium at which the subject safety and health standard is directed is Vanadium Pentoxide (V<sub>2</sub>O<sub>5</sub>). (T. 100-102, 140, 141), the violation created by 30 C.F.R. 57.5001 is for exceeding the TLVs for Vanadium fume or Vanadium dust. Vanadium pentoxide is one of several forms of Vanadium and is a separate, more toxic form thereof (T. 140, 141, 168, 208). The technique for the determination of Vanadium requires (1) determining the particular TLV (threshold limit value) of Vanadium (fume or dust) and then (2) determining approximate milligrams of Vanadium itself per cubic meter of air and applying to such determination a multiplication factor (error factor) to

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account for any vagaries inherent in the process. (T. 36-38, 97, 140, 159, 168). The Vanadium fume TLV of .05 mg/M is equivalent to a Vanadium Pentoxide reading of 2 1/2 times such level (T. 168).

The subject Citation was issued by MSHA Inspector Michael T. Dennehy on May 15, 1985, the second day of a two-day inspection of Respondent's Parachute Creek Mine, an underground oil shale mine located near Parachute, Colorado. On the first day of the inspection, May 14, Inspector Dennehy ascertained that hard surface welding using vanadium rods was being conducted on the secondary crusher and decided to sample miners engaged in this work on the following day. In furtherance thereof he called an MSHA health technician in Grand Junction, Colorado and requested that welding fume filters be prepared for his survey to be conducted the following day and precalibrated his P-2500 pumps in preparation therefor. (T. 11-15; Ex. P-1).

After calibrating the pumps on May 14, 1985, and charging them overnight, Mr. Dennehy returned to the mine site the next morning with five pumps and air filters (T. 15). Mr. Dennehy proceeded to the crusher area of the mine where four employees were welding (T. 16) and he placed the pumps on them by fastening the pump to their belt, putting the pump hose behind their back, and placing the top of the hose in their breathing zone (T. 18). Each pump contained a filter that was placed in the pump by Mr. Dennehy after removing the pre seal number (T. 19, 22). Mr. Dennehy recorded the pre seal number on his health field notes (Ex. P-2) (T. 22, 23). Mr. Dennehy also recorded on Exhibit P-2 the time he turned on the pumps and he noted the names of the employees (T. 21). After turning on the pumps, Mr. Dennehy left the area to conduct further inspection (T. 24).

At issue in this matter is sample number MD-1 as indicated on Ex. P-2. Mr. Dennehy left the pump on the employee wearing sample MD-1 for the entire shift period. He interrupted the fume sampling at one point during the day to take a 30 minute short term sample (T. 25). He indicated the 30 minute sample by making entries on his notes (Ex. P-2, P-1) (T. 27). At the end of the shift Mr. Dennehy removed the pumps from the employees, removed the filter from each of the pumps, and sealed the cassette. He put the cassette back into the holding tubes and returned to his office in Grand Junction. He then did a post calibration of the pumps and entered this on his presampling calibration sheet (Ex. P-1).

At the Grand Junction field office Mr. Dennehy returned the sampling cassettes and filters to the health technician (T. 28, 29). Mr. Dennehy returned the entire sealed cassette to the technician. The technician then sent the cassette to Denver for analysis (T. 85, 86). Along with the cassettes was sent a request for analysis, specifically, the analysis of the 16 elements of welding fume (T. 86).

In response to his request, Mr. Dennehy received from the Denver Safety and Health Technological Center, MSHA, in Denver, an Elemental Analysis Report dated 6/5/85 (Ex. P-3) (T. 29, 86). The report from the technology center indicated to Mr. Dennehy that sample MD-1 contained 47.4 micrograms of vanadium. To determine the exposure to the elements listed on Exhibit P-3, Mr. Dennehy conducted calculations on a fume worksheet (T. 30-32) and determined that the concentration of vanadium was .0678 milligrams per cubic meter (T. 33). Mr. Dennehy next looked in the 1973 TLV booklet for the TLV for vanadium. He found the TLV to be .05 milligrams per cubic meter (T. 34). Mr. Dennehy indicated that although vanadium was listed twice in the TLV book he used the TLV for vanadium fume because the employees involved were conducting welding which creates fumes from the vanadium welding rod (T. 34, 49).

The .05 mg/M3 TLV for vanadium fumes is a ceiling limit. As Mr. Dennehy indicated, a ceiling limit means that at no time should this limit be exceeded (T. 35). Once he ascertained the TLV for vanadium, Mr. Dennehy discussed his calculations with Richard L. Duran, an MSHA industrial hygienist in Denver to be certain of his calculations. Mr. Duran concurred that the calculations were correct.

Mr. Dennehy also discussed with Mr. Duran an error factor in the exposure. He then calculated an error factor of 1.16; even with this error factor the exposure was above the .05 milligrams indicated in the TLV booklet (T. 38).

Vanadium is an element found in hard metal, in this case, in the rods being used to weld. Application of heat vaporizes the material and if it is mixed with air or it oxidizes, vanadium pentoxide results (T. 100). The sample taken by the Inspector indicated the presence of vanadium; as above noted, the TLV is stated in terms of vanadium (fume or dust) not vanadium pentoxide (T. 100, 102, 168). A welding operation using a rod containing V will produce V2O5 (T. 34, 101). The TLV booklet indicates that the standard for vanadium fume is .05 milligrams per cubic meter. Here, where the value is .0678 milligrams per cubic meter of vanadium, there would have been two and one-half times as much vanadium pentoxide as vanadium because vanadium pentoxide is heavier than vanadium. The value for V2O5, vanadium pentoxide, would be two and one-half times as great as the value for vanadium (T. 102). An overexposure then to .0678 milligrams per cubic meter of vanadium would indicate an exposure to V2O5 at two and a half times that amount (T. 102, 168). The TLV booklet indicates a ceiling level of .05 for vanadium fume. An exposure of .0678, as in this case, is an incursion of 35 to 36 percent over the TLV (T. 103, 159) and is in and of itself a violation of the subject safety standard (T. 220, 223, 236, 237).

At no time did the employees tested use respirators while engaged in welding and while the sampling was being conducted (T. 35), nor was the exhaust fan at the crusher system turned on (T.

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35, 36) until the afternoon of the sampling day (T. 36). Had the exhaust fan been operating, the miner (welder) involved would not have been over-exposed (T. 35, 36, 71).

Visible dust in the area where the sampling was conducted was not observed by either the Inspector (T. 17) or by Respondent's observer, Steve Findlay (T. 191, 192).

After discussing the matter with Mr. Duran, the Inspector indicated on the Citation that the occurrence of the event against which the cited standard is directed was reasonably likely and that the injury resulting from or contemplated by the occurrence of such event could reasonably be expected to be "permanently disabling" (T. 38-40, 77-80). At hearing, the Secretary abandoned the contention that any resultant injury would be permanently disabling (T. 156).

At all times during the inspection and the conducting of the air samples, Mr. Dennehy followed the proper procedure and used the proper filters and equipment (T. 83, 95-96, 99, 136, 140-142, 168). Mr. Dennehy's sample, therefore, was accurate and showed that overexposure had occurred to at least one employee as indicated by sample MD-1 on Exhibit P-4. The sampling was conducted for vanadium fume which I conclude was proper in this instance. Thus, Mr. Duran, MSHA's expert witness, testified that during the welding process, when the materials vaporized and mix with the air and condense, fume is produced (T. 98-99). Mr. Duran also credibly testified with respect to the propriety of testing for fume, to wit:

"Q. Based on Mr. Dennehy's testimony and in your opinion, was it appropriate for Mr. Dennehy to test for fume?

A. Yes.

Q. Why is that?

A. The rod and the metal that's being welded in the welding process, there will be material vaporized when the vapor - and as I indicated, when materials vaporize and mixes with the air and condensed, it is a fume. The welding process itself does not produce any dust.

Q. Just a fume.

A. Yes.

Q. Now, based on the testimony you heard and in your opinion, was there a fume present?

A. Yes.

Q. I'll refer your attention again to the TLV booklet that you have in front of you. There's a listing for vanadium and right after vanadium it says V205. Will you explain what that indicates?

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A. The standard is for vanadium V2O5, vanadium pentoxide. But the standard is in terms of vanadium. Not vanadium pentoxide.

Q. What does that mean as far as -

A. It just simply means that in the case of welding the standard is vanadium pentoxide. But as far as the analysis and the concentration of air, it's all based just on vanadium. Not vanadium pentoxide.

Q. Okay. How does one get vanadium pentoxide?

A. You get it from welding.

Q. What is it exactly?

A. Well, as I indicated, you may have, say, a metal, vanadium, and if you heat it or in the case of welding, you vaporize some of the material. If it mixes with air or oxidizes, then you can get vanadium pentoxide.

Q. In your opinion, was vanadium pentoxide present?

A. Yes." (T. 99-100).

Inspector Dennehy's testing for vanadium fume, rather than testing for vanadium dust or some other "mixed" test, is thus supported in the record and found to be proper (T. 34-35, 50-53, 96-99, 136-138, 140, 159, 168, 236-238). The TLVs themselves, being an incorporated and integral part of the safety and health standard involved, call only for determination of either a fume or a dust measurement.

#### Discussion

As one of its concerns, Respondent, citing the decision of the Federal Mine Safety and Health Review Commission in *Secretary v. Tammsco, Inc. and Schmarje*, 7 MSHRC 2006 (1985), argues that "the law requires that a violation of 30 C.F.R. 57.5001/5005 be established by actual sampling and analysis." Respondent emphasizes in its argument that exposure levels are to be determined by actual sampling, not by inference, and goes on to argue (1) that a reading for vanadium alone is insufficient to sustain a finding of vanadium pentoxide exposure, and (2) that the law requires and MSHA must prove that the type of activity performed by Respondent created the presence of vanadium pentoxide. Respondent's contention to the contrary, the TLVs patently contemplate the determination of vanadium pentoxide be made by testing (sampling) either vanadium fume or vanadium dust. (T. 100-102, 168, 236-238). In *Tammsco*, supra, MSHA conducted no sampling or testing. However, in the instant matter, the record is clear that Inspector Dennehy's determination that the exposure

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level exceeded the applicable TLV was based on actual sampling following lengthy procedures and not on inference. The differences between that proceeding and this, as well as the differences and interplay between 30 C.F.R. 57.5001 and 5005 were pointed out by the Commission in Tammsco, to wit:

"We agree with the judge that in order to establish a violation of section 57.5-5, the Secretary must first prove a violation of section 57.5-1. It is clear from the language of the Secretary's standard that section 57.5-5 establishes an exception to the general mandate of section 57.5-1 which requires that airborne contaminants not exceed their TLV, and that the application of section 57.5-5 is conditioned specifically on a determination that miners are exposed to excessive levels of airborne contaminants in violation of section 57.5-1. These exposure levels are to be determined by actual sampling, not by inference. As the judge noted, however, the citation at issue alleges a failure to comply with a provision of the "dust control plan", and does not allege overexposure to airborne contaminants. We agree with the judge that the Part 57 air quality standards do not provide for the adoption and approval of a dust control plan which can be enforced as a mandatory health standard. Cf. Carbon County Coal Co., 7 FMSHRC 1367, 1370 (September 1985) (discussing the approval and adoption of dust control plans required by 30 U.S.C. 863(o)). For this reason, and because no monitoring, testing or sampling of employees or the atmosphere was performed by MSHA during the inspection, the judge correctly dismissed the proceedings." (Emphasis added).

The "exception" to the proscriptions of subsection 5001 referred to in the opening line of 5001, i.e. "Except as permitted by 57.5005" is contained in the second and third sentences of subsection 5005. These two sentences permit miners in certain specified situations to work "for reasonable periods of time" in concentrations of airborne contamination exceeding permissible levels "if they are protected by appropriate respiratory protective equipment."

In this proceeding the Secretary has established that a miner was exposed, in violation of 30 C.F.R. 57.5001, to an excessive level of airborne contaminant. The Secretary also established that the miner was not wearing protective equipment and that a ventilation fan in the area involved was not operating for a significant part of the time that sampling was conducting (T. 35, 36). Respondent, on the other hand, made no showing that it was entitled to relief under the Subsection 5005 exception, and its various contentions in this connection, being unsupported in the record in either fact or legal authority, are rejected.

Nor does the record support the certitude in Respondent's flat assertion (Respondent's Brief at page 5) that ". . . MSHA mistakenly assumed that the samples taken on or near the welders at the mine on May 15th were entirely welding fumes. In reality,

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vanadium dust from surface brushing entered the filter." Thus, Respondent's chief witness on this critical point, Steve Findlay, on direct examination, gave an "opinion" on what is a question of fact to this effect " . . . I believe, the sample was contaminated . . . " (T. 186).

Subsequently on cross-examination, Mr. Findlay, with commendable candor, significantly qualified even this opinion:

"Q. did you, on that particular day - see if I understand this. You testified that the employees were brushing the metal?

A. Yes.

Q. Did you see them brushing the metal?

A. No, I didn't.

Q. Do you know when that occurred?

A. I'm sure that occurred prior to them doing the hard surfacing. What would happen is they would have to - each teeth, like I said, the separate teeth on the grinder - as they're working on each one of those, the next row they go to they probably brush it and so forth. Clean it.

Q. So you say they probably did that?

A. Well, it's a standard operating procedure.

Q. Could they brush the entire - all of the teeth first and then weld?

A. That's possible, but normally that's not done.

Q. They lift their mask when they do the grinding?

A. They usually take off their helmets.

Q. And they don't use any personal protective equipment when they brush?

A. No.

Q. And you're not saying they did any grinding on that particular day?

A. Not that I'm aware of.

Q. You indicated that you were in the area when the inspector was, is that correct?

A. The majority of the time.

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Q. Did you notice any dust in the air?

A. Well, no. But, you know, you can't see dust. Like some micron particles of dust or micron particles, of course, you won't be able to see. Visual test of the dusting is not one way to monitor the presence of dust.

Q. I understand that. I'm just asking if you saw anything in the air that day that would indicate the presence of dust.

A. No.

Q. Is it your testimony then that this brushing put dust particles into the air?

A. Yes. That's a good possibility.

Q. What kind of dust particles?

A. Well, there's shale dust, there's dust also from the vanadium that's been laid on before that.

Q. I'm sorry. Are you saying that they brushed the vanadium that's already been laid?

A. No. What I'm saying is they had put a surface of vanadium on there prior. Like I said, they've done this before. So possibly there was surface metal there brushing and so forth.

Q. So you're saying that the brushing then puts the dust in the air?

A. That's a possibility.

Q. That's a possibility. During the welding process, if that flame, the welding flame, hits the dust, what effect does it have on the dust?

A. Depending on the force of the flame, I don't know. It could make it airborne. I'm not sure.

Q. Could it turn into a fume?

A. The dust itself?

Q. Yes.

A. I wouldn't think so. No. I don't know.

Q. I'm sorry. You don't know or you don't think so?

A. I don't know.

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Q. You don't know. All right. I'm not sure I heard exactly what you said, but you said that the samples were - what word did you use? You had an opinion as to the sampling procedure.

A. I believe what I said was the sample might have been contaminated.

Q. Might have been contaminated. And what's the basis of that opinion?

A. Well, we're sampling for fume and there's a possibility that particulates could have ended in the filter.

Q. Would those particulates have entered the filter while they had their masks down? Their welding masks.

A. I don't see how.

Q. So it would have been during the time they had taken their - are they called masks or shields?

A. Hoods.

Q. Hoods. During the time they took those hoods off?

A. Right. The shades on those are so dark that it would be quite impossible to do any work outside of welding using that torch with the hood on. You just couldn't see.

Q. I believe you told me that you didn't stay with these welders all day as the inspector didn't stay with them.

A. Right.

Q. And did you see how often or were you able to observe how often they had their hoods on or off?

A. No. The only time I observed it, of course, was when I went up to change my filters.

Q. What were they doing when you changed your filters?

A. Mr. Everett, I believe, was sitting - I was talking to him for a while. He was changing some rods. And he was talking about taking a break. It was close to 2:00 o'clock. And I didn't observe him doing anything else.

Q. Did you observe them welding during the day?

A. Yes.

Q. Did you observe them doing any brushing during the day?

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A. Not that I can recall.

Q. Now, you indicated that in your opinion - correct me if I'm wrong. In your opinion the sample might have been contaminated.

A. Yes.

Q. Contaminated with -

A. Particulates.

Q. Particulates. Now I understand you're not a chemist, right?

A. Right.

Q. Do you know if that has any effect on the analysis that is done?

A. It could. I mean, if you have vanadium from other sources it could have an effect because what you're measuring on the analytical is the total vanadium. You can't distinguish between one that's coming from a fume and one that's not. (T. 190-195)." (Emphasis supplied.)

On the basis of the speculative nature of this evidence, and in the absence of testimony from other witnesses having actual knowledge with respect to dust being present, the quantities thereof, as well as the specific effect if any, such would have on the sampling results, I am unable to find, as Respondent urges, that the Inspector's vanadium fume testing procedures were defective or that the results thereof were invalid as to sample number MD-1 (Ex. P-2). I have previously determined that the Inspector's choice to sample for vanadium fume - rather than V dust - was proper and justified in the record. From evaluation of Mr. Findlay's testimony and the remainder of the record one is constrained to conclude that Respondent did not establish by probative evidence that dust, in any amount, entered the sampling filter employed by Inspector Dennehy. In any event, Respondent did not establish what, if any, amount of dust entering the sampling filter would vitiate the result of Inspector Dennehy's testing.

Although Respondent makes various attacks on the validity of the Secretary's testing procedures, the record is bereft of the required factual and/or legal foundations therefor. It appears that the Secretary has established by a preponderance of the reliable and probative evidence that a miner was exposed to a level of airborne contaminant in excess of the applicable TLV, a violation of 30 C.F.R. 57.5001 is found to have occurred.

The question remains whether this was an S & S violation, that is, whether it is of such nature as could significantly and substantially contribute to the cause and effect of amine safety or health hazard.

A violation is properly designated 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." Cement Division, National Gypsum Co., 3 FMSHRC 822, 825 (April 1981).

In Mathies Coal Co., 6 FMSHRC 1 (1984), the Commission listed four elements of proof for S & S violations:

In order to establish that a violation of a mandatory safety standard is significant and substantial under National Gypsum the Secretary of Labor must prove: (1) the underlying violation of a mandatory safety standard; (2) a discrete safety hazard - that is, a measure of danger to safety - contributed to by the violation; (3) a reasonable likelihood that the hazard contributed to will result in an injury; and (4) a reasonable likelihood that the injury in question will be a reasonably serious nature.

In the United States Steel Mining Company, Inc., 7 FMSHRC 1125, 1129 (1985) the Commission expounded thereon as follows:

We have explained further that the third element of the Mathies formula "requires that the Secretary establish a reasonable likelihood that the hazard contributed to will result in an event in which there is an injury." U.S. Steel Mining Co., 6 FMSHRC 1834, 1836 (August 1984). We have emphasized that, in accordance with the language of section 104(d)(1), it is the contribution of a violation to the cause and effect of a hazard that must be significant and substantial. U.S. Steel Mining Company, Inc., 6 FMSHRC 1866, 1868 (August 1984); U.S. Steel Mining Company, Inc., 6 FMSHRC 1573, 1574-75 (July 1984).

I have previously found that a violation occurred. It is also determined on the basis of my prior findings that a measure of danger to safety, or in this matter, health, was contributed to by the violation. The primary issue raised is whether the Secretary established that there existed a reasonable likelihood that the hazard contributed to would result in an injury (illness).

Inspector Dennehy indicated in the Citation that an overexposure was reasonably likely to occur. Inspector Dennehy, at hearing, expressed a belief this event was reasonably likely to occur because the operator did not provide ventilation at the site of the welding, nor did they provide respirators to the

employees who were conducting the welding. As part of the process of completing the citation Inspector Dennehy discussed this finding with Mr. Duran, as well as the part of the citation where he indicated that an injury could occur that might be permanently disabling.

Mr. Duran indicated that the symptoms resulting from an overexposure to vanadium "could" create serious health hazards (T. 105, 106). His opinion was based on the fact that bronchial irritation could occur, as well as possible pneumonia or asthma (T. 106). Another possible effect of vanadium overexposure, depending on the individual, is that such an employee could become "sensitized" meaning that after being exposed on one occasion he might experience more severe symptoms with the next exposure at the same-or even lower-concentration (T. 106-111). Mr. Duran indicated that an incursion of 35 percent over the TLV would be an exposure of a "moderate" level (T. 109-110). Mr. Duran indicated that while symptoms would vary from person to person an employee exposed to vanadium at a certain level "might" develop symptoms (Tr. 110). He said an employee exposed to .0678 milligrams per cubic meter of vanadium "could" develop a cough, sore throat and have trouble breathing and he could also develop symptoms similar to those encountered with the flu (T. 110, 111). Such symptoms "could" result in lost workdays and, in Mr. Duran's opinion on this point, which I credit, these would be relatively serious illnesses (T. 111).

Close scrutiny of Mr. Duran's testimony in connection with the "likelihood" of an injury or illness occurring reveals it to be of the same speculative complexion previously attributed to Mr. Findlay's testimony respect to the possible contamination of the sampling filters.

In contradiction of Mr. Duran's opinion, Respondent's expert witness, Dr. Paul Ferguson, a toxicologist, gave as general opinions that an .0678 exposure to vanadium fume would not cause an injury resulting in lost work days, that there was not a reasonable likelihood that such an exposure would result in an illness, and that there was not a reasonable likelihood that any resulting illness would be of a reasonably serious nature (T. 215-217).

In support of his opinion relating to the probability or likelihood that such (.0678 V fume) exposure would result in an illness Dr. Ferguson provided the following rationale:

"A. Based on the scientific literature, .1 milligrams per cubic meter is the lowest level where we see symptoms. They're not debilitating symptoms, but an individual will have a slight irritation and have some coughing. That can be defined as an illness. We don't want to allow our workers to be exposed to levels - how minor do cause symptoms. Above that, the symptoms progress severely. the .05 limit includes a safety factor that to the best of our knowledge, would provide no symptoms. There

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are no specific scientific literature that tested men and women at .05. That lowest level is really a .1 in a controlled experimental condition by Zenz and Berg is what the TLV is based on and they have that as a safety factor.

Q. So you would attribute the difference then to a margin of safety allowed by the drafters of the TLV's.

A. Yes." (T. 237, 238).

Dr. Ferguson's opinion that there was not a reasonable likelihood of an injury (illness) occurring at the level of exposure detected by Inspector Dennehy is, in view of its positive and convincing tenor and supportive rationale, accepted. Such is deemed to rebut and overcome any presumption to the contrary. See Consolidation Coal Company, 8 FMSHRC 890 (1986). Accordingly, it is concluded that the violation is not S & S.

#### PENALTY ASSESSMENT

The Secretary proposes a penalty of \$112.00 which in his post-hearing brief the Secretary concedes takes into consideration a low degree of gravity. Other mandatory penalty assessment criteria were the subject of stipulation by the parties at the hearing (T. 4), and based thereon it is found that Respondent is a large mine operator, that payment of a penalty at the monetary level urged by the Secretary will not jeopardize Respondent's ability to continue in business, and that Respondent, after notification of the violation, proceeded in good faith to achieve rapid compliance with the subject safety and health standard. The computerized printout submitted by the Secretary as evidence of Respondent's history of prior violations for the 2 year period preceding the issuance of the Citation involved here reflects that Respondent committed 12 violations during such period.

With respect to the remaining mandatory penalty assessment criterion, negligence, the Secretary's apparent theory is that Respondent negligently failed (a) to provide the subject miner with respiratory protective equipment, and (b) turn on an exhaust fan in the area where the welding was being conducted. Would the fan, in the terms of the standard, 30 C.F.R. 57.5005, have removed the airborne contaminants by "exhaust ventilation" or have controlled employee exposure by "dilution with uncontaminated air"? According to the Inspector, if the fan had been operating, the welders would not have been "exposed whatsoever" (T. 36). The provision specifically requiring protective respiratory equipment is applicable only where the 5005 exception to 30 C.F.R. 57.5001 is claimed or established by the respondent mine operator. Such is not the case here.

While I am unable to fully fathom the Secretary's theory of negligence, it does appear, insofar as the welders were allowed to conduct welding with the exhaust fan turned off, that respondent was negligent in this regard. According to the Inspector, employment of the exhaust fan would have alleviated

