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SECRETARY OF LABOR, Complainant, v. KRAFT FOOD INGREDIENTS CORP., Respondent.	OSHRC DOCKET NO. 88-1736

DECISION

BEFORE: FOULKE, Chairman; and MONTOYA, Commissioner.

BY THE COMMISSION:

At issue in this case is whether a Review Commission Administrative Law Judge erred in affirming several serious violations of requirements for welding and cutting promulgated by the Secretary's Occupational Safety and Health Administration ("OSHA"). The specific standards at issue are:

(1) The former section 1910.252(d)(2)(vi)(*c*), prohibiting welding and cutting in potentially explosive atmospheres;
(2) The former section 1910.252(d)(2)(xiii)(*a*), requiring establishment of procedures for safe welding and cutting; and
(3) The former section 1910.252(d)(2)(xiv)(c)(3), requiring scheduling of welding and cutting to avoid start-up of plant operations that might expose combustibles to ignition.[1]

For the reasons that follow, we affirm the judge's findings of violations as to the first two standards, but we vacate the remaining item.

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[1]The direction for review in this case also raised the issue whether the judge erred in affirming a nonserious violation of former § 1910.252(d)(3)(i), requiring cleaning of used containers before welding or cutting. The Secretary has notified the Commission of his intent to withdraw that charge, however. Thus, that item will be vacated. *Cuyahoga Valley R. Co. v. United Transp. Union*, 474 U.S. 3, 7-8 (1985) (Commission may not review Secretary's decision to withdraw citation).

BACKGROUND

The alleged violations arose from a fatality investigation at Kraft's plant in Sherman, Texas. One maintenance employee died, and another was seriously injured, as the result of a fire and explosion which occurred while they were using an acetylene torch to cut bolts on a valve in an overhead metal pipeline.

The pipeline carried various edible oils that Kraft refines and blends to make margarine, salad dressing and other food products. Oil transfers are carried out in the process department by Kraft's oil pumpers, under instructions from their process shift supervisor. On the morning of April 2, 1988, James Hayden, the corn oil pumper on the morning shift, transferred corn oil through the section of pipe which was to be affected by the cutting. Following the transfer, which left some residual corn oil in the section, Hayden closed a valve on one side of the area to be cut, to block the flow of corn oil to that area. However, he left the valve on the other side open, and kept on the air pressure of 60-80 pounds per square inch ("psi"). Hayden told Kraft's process shift supervisor, Paul Montgomery, that the transfer had been completed. When Hayden's shift ended at noon, he was replaced by Charles Manhart. Manhart was not aware of the planned cutting, and he did not turn off the air pressure or close the open valve before the cutting commenced.

Two of Kraft's maintenance employees, Daniel Cunningham and Michael Bartholomew, began cutting about 1:05 p.m., after being told by Montgomery that the line was ready. The work was part of the plant's "kosherization" process, which involved cleaning and separating oil transfer lines to ensure that animal oils could not mix with vegetable oils. "Kosherization" involved removing unused three-way valves such as the one involved in the accident.

To prepare for the cutting, Bartholomew secured the pipe section with a cable so that it would not fall to the floor when the bolts were cut. Bartholomew testified that there is no way to prevent the pipeline from shifting during such a cutting operation. He further testified that both he and Cunningham stood on a tank which was about four feet high to do the cutting. Cunningham cut three bolts from the three-way valve with the acetylene torch, and had started on the fourth bolt when the pipeline shifted slightly. The gasket at the flange between the valve and the line then broke loose. Corn oil flowed out of the line

and onto the floor for about 60 seconds (probably about a quart in all). Then the gasket exploded into flames and fire spread toward Bartholomew. He tried to jump off the tank, but was unable to do so before the "fire explosion," as Kraft terms it, reached him. Cunningham died as a result of the accident. Bartholomew was hospitalized for several months with severe burns.

ANALYSIS

1. Citation 1, Item 1: Former section 1910.252(d)(2)(vi)(*c*) -- now section 1910.252(a)(2)(vi)(C)[2]

The cited provision stated:

> **§ 1910.252 Welding, cutting, and brazing.**
>
> . . . .
>
> (d) *Fire prevention and protection* --
>
> . . . .
>
> (2) *Special precautions.* When the nature of the work to be performed falls within the scope of subdivision (ii) of this subdivision certain additional precautions may be necessary:[3]
>
> . . . .
>
> (vi) *Prohibited areas.* Cutting or welding shall not be permitted in the following situations:
>
> . . . .
>
> (*c*) In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.

The Secretary argues that the standard was violated because an acetylene torch was used to cut bolts from a valve connected to the pipeline containing a residue of a flammable liquid (corn oil) mixed with compressed air. The Secretary asserts that during the cutting,

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[2]Section 1910.252 was reorganized on April 11, 1990. The provisions cited here were redesignated as parts of section 1910.252(a). The substance of section 1910.252 was unchanged, however. *Final Rule: Welding, Cutting and Brazing*, 55 Fed Reg. 13,694, 13,696 (1990).

[3]The reference to "subdivision (ii)" was reworded in the 1990 amendment to the standard (*see supra* note 2). The current version (§ 1910.252(a)(2)), explicitly refers to the *preceding* subdivision (ii) (now paragraph (a)(1)(ii)). That paragraph requires heat guards "[i]f the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed[.]" Heat guards would have been required for the work here, for example, because of the combustible nature of the corn oil which dripped from the opening in the pipeline. Kraft does not argue that the limitation of the standard to work within the scope of "subdivision ii" renders it inapplicable here.

the torch could heat the corn oil/air mixture enough to cause it to develop into an explosive atmosphere inside the pipeline, which was "uncleaned or improperly prepared equipment" under the standard.[4] The judge found that:

> the standard's requisite of the presence of an explosive atmosphere or a situation where an explosive atmosphere may develop has been fulfilled by the facts of this case. . . . Under the circumstances herein, it is foreseeable that the line and gasket might move, permitting anything therein (air and oil) to escape.

Thus, he found essentially that the acetylene flame could ignite the corn oil/air mixture as it escaped from the pipe when the bolts were cut, and that the ignition could spread into the pipeline, creating an explosive atmosphere there.

Kraft objects to the judge's finding of a violation on three basic grounds. It argues that the judge: (a) improperly construed the cited provision by equating "flammability" or "combustibility" with "explosive atmosphere"; (b) gave insufficient weight to a study by an independent laboratory on the hazards in the piping system; and (c) improperly disregarded the testimony of its Corporate Safety Director on the issue. It also argues that the citation should be vacated because it did not know, and could not reasonably have known, that the hazards existed.

a. Kraft's argument that the judge improperly equated "flammability" or "combustibility" with "explosive atmosphere"

Kraft acknowledges that a "fire explosion" occurred. It contends, however, that the citation should be vacated because the Secretary did not prove that an explosive atmosphere existed inside the pipeline. The standard prohibits welding and cutting in the presence of an explosive atmosphere as well as wherever "explosive atmospheres *may develop* inside uncleaned or improperly prepared tanks or equipment which have previously contained [mixtures of flammable gases, vapors, liquids, or dusts with air]." (Emphasis added.) The

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[4]We accept the Secretary's position, and the judge's implicit finding, that the pipeline was "equipment" covered by the standard. Kraft has not disputed the issue. We note that among the common definitions of "equipment" is "apparatus," or "the fixed assets other than land and buildings of a business enterprise <the plant, *equipment* and supplies of the factory>." *Webster's Third New International Dictionary* (1986).

judge affirmed the violation based on his finding that it was foreseeable that an explosive atmosphere may develop, and we agree.[5]

Kraft argues that although the corn oil may be flammable or combustible, the Secretary did not show that it may be "explosive," which is what the cited standard regulates. As the judge noted, however, the term "explosive atmospheres" is defined in terms of "mixtures of flammable gases, vapors, liquids, or dusts with air . . . inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials." The judge correctly found that those flammable mixtures may develop into "explosive atmospheres" where they occur inside uncleaned tanks or equipment.

The judge's finding is supported by the source standard published by the National Fire Protection Association ("NFPA") -- NFPA Standard 51B, 1962 ["NFPA welding standard"]. *See* section 1910.256. The NFPA welding standard is expressly referred to in former section 1910.252(d)(1) -- now section 1910.252(a)(1).[6] Kraft relies on that standard as a guide to the meaning of the cited requirement.

The NFPA welding standard states, "[f]ire and explosions have also been caused where this heat [heat of the metal being welded or cut] was transmitted, as in the case of a container, through the metal to a flammable atmosphere or to combustibles within the container." The NFPA standard makes clear that where oxygen and fuel gas (such as

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[5]Kraft points out that the citation and Complaint alleged the violation in terms of "the *presence* of an explosive atmosphere" (emphasis added). However, Kraft does not protest the judge's reliance on the language of the standard that prohibits cutting where an explosive atmosphere "*may develop.*" The Secretary submitted a great deal of evidence on that requirement without objection, and that evidence would not be relevant unless the issue of whether an explosive atmosphere "may develop" was being tried. Kraft does not suggest that it was unaware that its compliance with that part of the standard was a disputed issue tried at the hearing. Based on these circumstances, we find that the parties squarely recognized that the issue whether an explosive atmosphere "may develop" in circumstances like those involved here was being tried, and thus the judge's reliance on that language was proper. *Cf., e.g., Armour Food Co.*, 14 BNA OSHC 1817, 1823-24, 1987-90 CCH OSHD ¶ 29,088, p. 38,885 (No. 86-247, 1990) (trial by consent of unpleaded issue may be found only when parties squarely recognized that they were trying that issue).

[6]That provision stated:

> (d) *Fire prevention and protection*—(1) *Basic precautions.* For elaboration of these basic precautions and of the special precautions of paragraph (d)(2) of this section as well as a delineation of the fire protection and prevention responsibilities of welders and cutters, their supervisors (including outside contractors) and those in management on whose property cutting and welding is to be performed, see, Standard for Fire Prevention in Use of Cutting and Welding Processes, NFPA Standard 51B, 1962. . . .

acetylene) flames have overheated "containers that had not been purged of flammable materials . . . an explosion generally resulted." That passage clarifies that NFPA viewed the hazard from ignition of the flammable materials in such containers as an explosion hazard. The Secretary's interpretation of the term "explosive atmosphere" to cover a mixture of a flammable liquid and compressed air, heated to a temperature at which it could ignite inside an uncleaned pipeline, is well supported.

We also agree with the Secretary's view that the corn oil here was a "flammable liquid" under the cited standard. The NFPA welding standard does not define "flammable," and uses it interchangeably with "combustible." It states that both fire and explosion hazards "can arise where the cutter or welder may not be aware of (1) the proximity or the *flammable* nature of nearby *combustible* solids, liquids, or dusts; [or] (2) the presence or development of possibly explosive mixtures of flammable gases and air; . . . ." (Emphasis added.) We have found no evidence that either NFPA or OSHA intended to limit the meaning of "flammable" in their welding standards to substances that ignite at temperatures below 100° F.[7] On the other hand, it bears noting that the temperature generated by an acetylene torch during cutting or welding typically exceeds 1000° F at the point of work, as it did here. In view of the very high temperatures involved with cutting or welding, it would be incongruous to read the cited standard as only applying to substances that ignite at temperatures below 100° F.

Furthermore, "flammable" is sometimes used interchangeably with "combustible" in ordinary speech. For example, "flammability" is defined as "ability to support combustion: burning rate <few materials completely lack *flammability*>; *usu*: high capacity for combustion . . . ." *Webster's Third New International Dictionary* (1986). A common definition of "flammable" is "capable of being easily ignited and of burning with extreme rapidity . . . compare COMBUSTIBLE, EXPLOSIVE . . . ." *Id.* A common definition of "combustible" is "capable of undergoing combustion or of burning -- used esp. of materials

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[7]By contrast, the general industry standard on "flammable and combustible liquids" defines "flammable liquid" as "any liquid having a flashpoint below 100° F," except where the portion of the liquid containing that flashpoint is 1% or less of the total volume of the mixture. Section 1910.106(a)(19). That standard defines "combustible liquid" as "any liquid having a flashpoint at or above 100° F." Section 1910.106(a)(18). The source standard for section 1910.106 is NFPA No. 30-1969, Flammable and Combustible Liquids Code. Section 1910.115. It is undisputed that Kraft's corn oil had a flashpoint of 610° F, and thus would be classified as combustible under that standard, rather than flammable.

that catch fire and burn when subjected to fire . . . ." *Id.* An "explosive substance" is defined as one "that on ignition by heat . . . undergoes very rapid decomposition (as combustion) with the production of heat and the formation of more stable products (as gases) which exert tremendous pressure as they expand at the high temperature produced; . . . ." *Id.*

Thus, we find here that corn oil was a "flammable liquid" under the standard. Kraft has not shown that more restrictive definitions of the relevant terms govern the standard. We therefore read the standard to prohibit welding and cutting where an explosive atmosphere may develop due to the heating of a corn oil/air mixture to its flashpoint inside a pipeline during the welding or cutting.

The evidence establishes that such an explosive atmosphere could develop here. The flashpoint of the corn oil was 610 degrees Fahrenheit (° F). The "flashpoint" is the temperature at which a liquid gives off enough vapor to form an ignitable mixture with air near the liquid's surface. Corn oil can be ignited at a lower temperature if it forms a mist, spray or froth with air. The evidence indicates that the corn oil mist could be ignited when preheated to a temperature in excess of 300° F. Corn oil is transferred through the lines at the Sherman plant at only about 110° F to 120° F. However, the judge found that the best estimate of the heat of the acetylene torch was approximately 1700° F. He credited the testimony of Leroy Smith, the former maintenance foreman, to that effect, based on Smith's work experience. Smith also testified that it is possible to heat the corn oil inside a pipe to 300° F while cutting pipe bolts with an acetylene torch.

Kraft argues that the judge confused the meaning of "explosive atmosphere" by equating that term with "flashpoint." To the contrary, however, the judge merely found that if the mixture of corn oil and compressed air were heated to its flashpoint *inside the pipeline*, an explosive atmosphere would exist. Again, his finding is fully supported by the NFPA welding standard.

Kraft also argues that the judge concluded that if there was an explosion, *a fortiori*, the corn oil must have been an explosive atmosphere. The judge did not draw that conclusion, however. Rather, he decided that the terms of the cited standard were violated, regardless whether the corn oil/air mixture *actually* developed into an explosive atmosphere

inside the pipeline. He held that the standard was violated because that mixture *could have developed* into an explosive atmosphere in the circumstances.[8]

Kraft further argues that the cited provision did not apply to mere explosive fire hazards because it did not explicitly mention them, whereas other provisions of section 1910.252(d) specifically regulated "fire hazards," "combustible material," "flammable materials," and "dangerous combustibles." Kraft relies on "a fundamental tenet of statutory construction that where particular language is used in one section of a statute but omitted in another section of the same statute, it is presumed that the inclusion or exclusion was done intentionally." However, Kraft's "legal presumption" approach would fail, even if it were appropriate to resort to a legal presumption here. A presumption that the cited provision did not apply to explosive fire hazards is implausible in view of the fact that the welding standard addresses such hazards, and that section 1910.252(d) was entitled "Fire prevention and protection." The best presumption is that a provision addressing explosive atmospheres, within a section that expressly addresses fire hazards, would cover explosive fire hazards.

b. Kraft's argument that the judge gave insufficient weight to the independent laboratory's study

Following the accident, Kraft had a sample of the corn oil from the piping system analyzed by the Southwest Research Institute ("SRI"), an independent laboratory in San Antonio, Texas. SRI's written report, a one-page letter, was introduced in evidence without objection. SRI also prepared a videotape showing tests it had conducted to determine the circumstances under which the corn oil would ignite. No attempt was made to submit that videotape in evidence. No one from SRI testified, and no one else who had been present during its tests testified.

SRI's report states that the flashpoint of the corn oil was 610° F and the fire point was 620° F. The report also states that it was not possible to ignite the corn oil when it was aspirated at ambient temperature and exposed to a fire source. The results were the same when welding grade oxygen from a ¼-inch tube was introduced under pressure of 50 psi at

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[8]Contrary to Kraft's assertion, OSHA compliance officer Thomas Smith did not testify that the air/corn oil mixture was explosive simply because the accident occurred. He acknowledged merely that there must have been *some* explosive mixture for the explosion to have occurred.

the base of the spray. "Ignition of the mist was successfully accomplished when the corn oil was preheated to a temperature in excess of 300° F."

The SRI report does not rebut the evidence on which the judge found a violation. The judge stated:

> Unfortunately, the Court had no opportunity to listen to testimony by the [SRI] research engineer (Eugene L. Anderson) or to view the video tape of the test which he conducted. However, it is noted that the air pressure in the subject line (60-80 psi) was higher than the pressure present in the test (50 psi). The heat of the torch at the workplace was vastly hotter than the heat employed in the test. Also, the size of the venting (prior to explosion) may [have] been quite different than that used in the test. Moreover, the little or small fireball seen by Manhart (second stage of chain reaction) was approximately the same length as the plume described in the test [by Leroy Smith, based on the videotape]. . . . I have not overlooked the possible differences in shapes described by Manhart (fireball-ankle to chest level) as contrasted to the one described in the test result (plume) or by Hanson's viewing of the video (narrow). . . . If not semantical in nature, then any actual difference in the shape of the fires could have resulted from possible differences in work and test conditions. In any event, the hazard of an explosive (mixture of flammable gases, vapors, liquids with air) atmosphere is well established in this case. The fact that an acetylene explosion dwarfs a corn oil explosion does not alter the essence of the latter.

(Citations to record omitted). The SRI report does not indicate that the conditions under which the SRI tests were conducted were actually comparable to those in the Sherman plant. The failure to submit the videotape, which would show the conditions under which the SRI tests were conducted, is unexplained. We therefore conclude that the judge correctly rejected Kraft's arguments based on the SRI report.

c. Kraft's argument that the judge improperly disregarded the testimony of its corporate safety director

Kraft's Corporate Director of Safety, Jack Hanson, testified that in his opinion it is very unlikely that the accident resulted from an explosive atmosphere due to the corn oil/air mixture inside the pipeline. Hanson has extensive qualifications on welding safety.[9] As elaborated below, however, Hanson acknowledged that an explosive atmosphere could have

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[9]Hanson had an undergraduate degree in mechanical engineering and manufacturing technology, and master's degrees in industrial operations and industrial safety. He had several years of teaching experience in the subject areas of welding, fire protection and safety engineering. He also had several years of welding and cutting supervisory experience.

developed inside the pipeline due to the corn oil/air mixture. This is the decisive issue here. The judge did not disregard Hanson's testimony. He discussed Hanson's testimony, and that testimony supports the judge's holding on the decisive issue.

When asked his opinion about the possible causes of the accident, Hanson's first response was, "[w]ell, the corn oil itself was a possibility." Hanson discussed "two possibilities with the corn oil." Those were that "the torch ignited the air/oil mixture" after the valve flange opened, or that the air/oil mixture, already ignited, ignited the acetylene due to a fissure in the acetylene hose.

Hanson testified that it is "highly unlikely" that the torch could have heated the corn oil to 300° F, because of the mass of the bolts on the valve flange, which were all that Cunningham was attempting to cut. Hanson further concluded that it is "very unlikely" that the torch ignited the corn oil vapors, because of Bartholomew's statement that the oil flowed from the flange for approximately 60 seconds before the explosion. Hanson opined that if the corn oil or its vapors were ignitable, they probably would have been ignited much more quickly and would have been burning when people arrived to investigate (Hazelwood was on the scene within 30 minutes, for example). On the other hand, as noted above, Hanson acknowledged that an explosion of the corn oil vapors was a possible cause of the accident.

Hanson testified that in his opinion the most likely cause of the accident was an acetylene explosion, due to Cunningham inadvertently passing the welding torch over the acetylene hose, which then vented acetylene, causing the explosion. Hanson testified that acetylene is extremely flammable and explosive. He testified that the eye witnesses' descriptions of the fire/explosion were consistent with an acetylene explosion. He also testified that, based on the SRI tests, corn oil would not be a self-sustaining ignition, and would tend to be "a narrow, straight type of flame, like a blowtorch as opposed to a big ball of fire," such as the one the witnesses to the accident described. Again, however, Hanson could not rule out a corn oil/air explosion.

It bears noting that there was a good deal of other testimony that a corn oil/air mixture may have developed into an explosive atmosphere in the pipeline. Leroy Smith, a manufacturing engineer for Kraft, testified that Bill Wardlaw, the maintenance superintendent at the time of the accident, said it was very possible that the corn oil caused the

accident.[10] Smith also testified that it is possible to heat the corn oil inside a pipe to a temperature of 300° F while cutting pipe bolts with an acetylene torch.[11]

Thomas Smith, the OSHA compliance officer ("CO") who conducted the inspection, gave the opinion that the accident happened because corn oil vapors, under air pressure of 60-80 psi, had been heated inside the pipeline during the cutting, expanded out when the valve flange opened, and were ignited by the acetylene torch. He testified:

> By heating you've created a mist out of the oil and when it mixes in the proper proportion with air that's under pressure, the pressure is immediately released, you've got an ignition source in the torch and you have the possibility of an explosion or fire or both.

The CO testified that "vegetable oils are pretty much known to burn," and that kitchen fires can result from overheating of vegetable oil. Smith had been a CO for four years. His relevant background in flammable and explosive materials was his basic, three-week training to be a compliance officer, and a hazardous materials course, both conducted by OSHA.

In summary, the evidence supports the judge's finding that an explosive atmosphere may develop where a mixture of air with a flammable liquid such as corn oil may become heated to its ignition temperature inside a pipeline.

d. Whether the Secretary established the requisite knowledge of the violative conditions

In order to prove a violation, the Secretary must show that the employer knew, or with the exercise of reasonable diligence could have known, of the violative conditions. *E.g., Tampa Shipyards, Inc.*, 15 BNA OSHC 1533, 1535, 1992 CCH OSHD ¶ 29,617, p. 40,097 (No. 86-360, 1992). Kraft argues that it had no reasonable way of knowing that the corn oil piping system could produce an explosive atmosphere. Hanson, its highly qualified Corporate Director of Safety, testified that "[i]n my inspections of this plant and several like

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[10]Wardlaw did not testify. Smith testified that Wardlaw was in the hospital with chest pains during the hearing. The judge discussed Smith's hearsay testimony about Wardlaw's statements, and Kraft raises no objection to consideration of that testimony.

[11]Leroy Smith gave the opinion that generally, when a bolt is cut out of a flange, as Cunningham did just before the accident, the surrounding pipe will not heat up. He testified that the speed of the operation and the mass of the flange prevent the heat from transferring to the pipe. On cross-examination, however, he testified that he was speaking of the "piping away from the bolt," that is, "within probably a foot" away. Hanson also testified that employees often can place their hand on the pipe while they are cutting off the end of the bolt, and don't sense any high temperature. However, Leroy Smith's testimony that the corn oil inside a pipe may be heated to 300° F while pipe bolts are being cut (as they were here) indicates that an explosive atmosphere "may develop" under those conditions.

it -- almost identical -- I've been in this [corn oil transfer] area many times and did not evaluate this as an explosive atmosphere." Hanson also gave the opinion that the cited standard "deals with a pre-existing condition where you would prevent an employee from going into an explosive atmosphere."

Thus, Kraft's argument that it lacked the means of knowledge of an explosive atmosphere rests on its interpretation that the standard applies only to explosive atmospheres that may develop *before* cutting or welding begins. However, the Secretary reasonably interprets his standard to prohibit welding or cutting that *may produce* an explosive atmosphere. As discussed above, the NFPA welding standard was concerned with explosions caused by cutting or welding on a container, with the heat being transmitted "to a flammable atmosphere or to combustibles within the container." Again, Kraft relies on the NFPA welding standard as a guide to the meaning of the cited standard. Thus, Kraft reasonably could have known of the violative conditions here -- permitting cutting or welding where an explosive atmosphere might develop inside the pipeline *due to* the cutting or welding.

We emphasize that we are not deciding here what actually caused the accident. We are addressing the limited issue of whether Kraft bears responsibility under the Act for noncompliance with the cited standard. We find that it does, because its supervisors permitted cutting to be done on bolts connected to a valve in a pipeline, when there was a significant risk of harm due to a potentially explosive mixture of flammable corn oil and air inside the pipeline.

e. Conclusion

The Secretary has proved all the elements of a violation. The standard applied to the cited conditions and Kraft failed to comply with the terms of the standard, for the reasons discussed above. Kraft's employees had access to the cited conditions and, with the exercise of reasonable diligence, Kraft could have known of those conditions. *E.g., Gary Concrete Products Inc.*, 15 BNA OSHC 1051, 1052, 1991 CCH OSHD ¶ 29,344, p. 39,449 (No. 86-1087, 1991). For these reasons, we affirm Item 1.

2. **Citation 1, Item 2: Former section 1910.252(d)(2)(xiii)(*a*) -- now section 1910.252(a)(2)(xiii)(A)**

The cited provision stated:

> (xiii) *Management.* Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and:
> (*a*) Based on fire potentials of plant facilities, establish areas for cutting and welding, and establish procedures for cutting and welding, in other areas.

The judge affirmed this citation item based on his finding that Kraft's "work policies, procedures, and work rules . . . were inadequate in this situation." He further found that Kraft's safety program "was lax in actual practice." We affirm a violation because Kraft lacked adequate procedures to assure that welding or cutting was not inadvertently carried out in the presence of a potentially explosive atmosphere.

Kraft notes that it established certain procedures for safe cutting and welding. Under Kraft's procedures, maintenance employees such as Cunningham and Bartholomew were required to get the process shift supervisor's permission before performing work such as torch cutting or welding with oxygen and acetylene. The process shift supervisor was in a position to know whether or not the line to be cut was in use.[12]

Kraft also had written procedures for its oil pumping operations. Before transferring oil through a pipeline, the oil pumper was to check all valves connected to the line to be sure the right ones were open and that the others were closed. After completing a transfer, the oil pumper was to "[b]e sure to burp line so as to clean line of all remaining oils to prevent contamination of oils or line solidifying . . . [and] [c]lose valve after air has been turned off."[13]

However, at the time of the accident, Kraft did not have a procedure to assure that oil pumpers were informed if a cutting operation was to be undertaken. The lack of such

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[12]The judge found that Kraft's procedure for getting the process shift supervisor's permission was not followed in practice. He noted Leroy Smith's testimony that it was normal to attach a "standard procedure list" to a work order at the time of the accident. However, he found the testimony of Bartholomew and Montgomery convincing that mechanics were never given that list. Kraft asserts that the mechanics were given extensive training which ensured that they knew the required procedures. Kraft may have trained mechanics in its procedures, but those procedures were inadequate.

[13]Kraft argues that the written oil pumping procedures were considered safety rules. However, the expressed purpose of those procedures was to "prevent oil spills or improper mixes" and to "prevent contamination of oils or lines solidifying." The evidence that Kraft cites does not show that those rules were explained to employees as safety requirements.

a procedure was important because, as oil pumper Manhart testified, it was a common practice for an oil pumper to leave air blowing on several different lines when his or her shift ended.[14] In fact, on the day of the accident Montgomery apparently assumed that the compressed air had been turned off and all valves closed, when oil pumper Hayden reported that the oil transfer had been completed. However, the air was on and a valve on one side of the area being cut was left open.[15]

The "procedures" that an employer is to establish are not spelled out in the cited provision. However, the provision must be interpreted to require reasonable procedures to avoid the various "fire potentials of plant facilities." We conclude that Kraft's lack of a specific procedure to assure that no welding or cutting was done where an explosive atmosphere could result inside a pipeline constitutes a deficiency under the cited standard.

3. **Citation 1, Item 3: Former section 1910.252(d)(2)(xiv)(*c*)(*3*) -- now section 1910.252(a)(2)(xiv)(C)(*3*)**

The cited provision stated:

> (xiv) *Supervisor.* The Supervisor:
> . . . .
> (*c*) Shall protect combustibles from ignition by the following:
> . . . .
> (*3*) See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.

The judge found a violation because:

> Montgomery, the process shift supervisor, was the only person of those involved who knew both that the valve was unblocked (had been unblocked) and that clearance was being given for mechanics to enter the line. Due diligence mandated that he make certain the air was not on the line and valve

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[14]Montgomery testified that he would not let maintenance employees work on a line if it was in use. However, he testified that he did not remember informing Manhart, the oil pumper whose shift started at noon on the day of the accident, that Cunningham and Bartholomew would be working on the line. Montgomery did tell Hayden, the oil pumper whom Manhart replaced at noon, about the planned valve removal. However, Hayden left the air pressure on (and the valve on one side of the cutting work open) following his oil transfer that morning, and did not tell Manhart about the planned valve removal. Manhart testified that he did not know the mechanics would be working on the pipeline until he noticed them, moments before the explosion.

[15]Montgomery knew that welding equipment might be used for the bolt removal. Bolts had been cut that way before during Kraft's kosherization process. In fact, Bartholomew told Montgomery before lunch that they were going to bring their rig up so that they could start immediately after he gave them the go-ahead.

blocks had been restored. He did neither. His knowledge of the facts is imputed to the Respondent.

Although Kraft's scheduling of cutting and welding was flawed, as discussed above under Item 2, the standard cited here only requires scheduling so as to avoid the *starting* of plant operations during cutting and welding, where these operations might expose combustibles to ignition. There was evidence regarding the starting of only one plant operation -- the transfer of oil -- and the evidence did not show that such a transfer could *start* during cutting or welding.

Rather, Kraft required the oil pumpers to check all valves along the pipeline to assure that the right ones were open and the others closed, before transferring oil. There was no evidence presented that oil pumpers failed to comply with that procedure. When checking the valves, the oil pumper would see whether welding or cutting was taking place, and would avoid any transfer that could affect that area. It bears noting that the oil transfer that Hayden carried out on the morning of April 2, 1988, was completed before the cutting began. There was no evidence presented suggesting that other operations that were shut down could actually start during cutting or welding. Thus, we vacate this item.

4. Whether Kraft proved the affirmative defense of unpreventable employee misconduct

Kraft argues that no violations should be found in this case because any noncompliance with the standards was due to unpreventable departures by employees from company safety rules.[16] Kraft points out that it had numerous safety rules and that it communicated them to employees in writing when they were hired, and in meetings. It notes that its written oil pumping procedures were distributed to oil pumpers and were discussed at meetings involving them. Kraft also presented evidence that it disciplined employees when it learned of violations of the rules.

However, as discussed above, Kraft did not have sufficient safety rules to prevent the violative conditions in this case from occurring. It lacked adequate procedures to deal with the hazards of flammable liquids and air mixing in uncleaned portions of its pipeline and

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[16]In order to negate a violation on those grounds, the employer must show that: (1) it established work rules designed to prevent the violative conditions from occurring; (2) the work rules were adequately communicated to its employees; and (3) it took steps to discover violations of those rules, and effectively enforced the rules when violations were discovered. *E.g., Gary Concrete*, 15 BNA OSHC at 1055, 1991 CCH OSHD at p. 39,452.

developing into an explosive atmosphere during cutting or welding. Accordingly, although Kraft had an active safety program, the program was not sufficient to support its defense of unpreventable employee misconduct.

5. Penalties

The Secretary proposed a penalty of $560 for each of the three alleged serious violations. Finding that each violation could be, and was, corrected by the same measures, the judge combined the penalties and assessed a single $560 penalty for the three violations that he found. The Secretary has not objected to that assessment.

Kraft is a large company and the hazards were severe. On the other hand, those hazards were far from obvious, as the testimony of Kraft's highly qualified Corporate Director of Safety indicates. Kraft had an active safety program, and had instituted certain pertinent procedures. There is no evidence of a similar incident occurring previously at a Kraft facility. Kraft showed complete good faith in cooperating with OSHA's investigation, and the Secretary did not indicate that Kraft has an unfavorable history of violations. Thus, considering the penalty factors set forth in 29 U.S.C. § 666(j), and considering that we are vacating one of those items, we will reduce the combined penalty to $375.

6. Conclusions

For the reasons given above, we affirm Items 1 and 2 of the Secretary's citation for serious violations, and we vacate Item 3 of that citation. We assess a total penalty of $375 for the two violations.

Edwin G. Foulke, Jr.
Chairman

Velma Montoya
Commissioner

Dated: September 20, 1993

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SECRETARY OF LABOR, Complainant, v. KRAFT FOOD INGREDIENTS CORP., Respondent.	:	Docket No. 88-1736

NOTICE OF COMMISSION DECISION

The attached decision by the Occupational Safety and Health Review Commission was issued on September 20, 1993. **ANY PERSON ADVERSELY AFFECTED OR AGGRIEVED WHO WISHES TO OBTAIN REVIEW OF THIS DECISION MUST FILE A NOTICE OF APPEAL WITH THE APPROPRIATE FEDERAL COURT OF APPEALS WITHIN 60 DAYS OF THE DATE OF THIS DECISION.** See Section 11 of the Occupational Safety and Health Act of 1970, 29 U.S.C. § 660.

FOR THE COMMISSION

September 20, 1993
Date

Ray H. Darling, Jr.
Executive Secretary

Docket No. 88-1736

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SECRETARY OF LABOR
Complainant,
v.
KRAFT, INC.
Respondent.

OSHRC DOCKET
NO. 88-1736

NOTICE OF DOCKETING OF ADMINISTRATIVE LAW JUDGE'S DECISION

The Administrative Law Judge's Report in the above referenced case was docketed with the Commission on January 24, 1992. The decision of the Judge will become a final order of the Commission on February 24, 1992 unless a Commission member directs review of the decision on or before that date. ANY PARTY DESIRING REVIEW OF THE JUDGE'S DECISION BY THE COMMISSION MUST FILE A PETITION FOR DISCRETIONARY REVIEW. Any such petition should be received by the Executive Secretary on or before February 13, 1992 in order to permit sufficient time for its review. See Commission Rule 91, 29 C.F.R. 2200.91.

All further pleadings or communications regarding this case shall be addressed to:

Executive Secretary
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Review Commission
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Petitioning parties shall also mail a copy to:

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Washington, D.C. 20210

If a Direction for Review is issued by the Commission, then the Counsel for Regional Trial Litigation will represent the Department of Labor. Any party having questions about review rights may contact the Commission's Executive Secretary or call (202) 634-7950.

FOR THE COMMISSION

Ray H. Darling, Jr.

Date: January 24, 1992

Ray H. Darling, Jr.
Executive Secretary

DOCKET NO. 88-1736

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UNITED STATES OF AMERICA

OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

SECRETARY OF LABOR, Complainant, v. KRAFT FOOD INGREDIENTS CORPORATION, Respondent.	:	OSHRC DOCKET NO. 88-1736

APPEARANCES: E. Jeffery Story, Esquire
Dallas, Texas
For the Complainant.

Douglas T. Moring, Esquire
Glenview, Illinois
For the Respondent.

DECISION AND ORDER

BOTKIN, Judge:

This is a proceeding brought before the Occupational Safety and Health Review Commission ("the Commission") pursuant to § 10 of the Occupational Safety and Health Act of 1970, 29 U.S.C. § 651 et. seq. ("the Act").

The Occupational Safety and Health Administration ("OSHA") inspected Respondent's plant in Sherman, Texas, after a tragic accident which occurred on April 2, 1988. As a result of the inspection, two citations were issued. The first citation alleges serious violations of 29 C.F.R. §§ 1910.252(d)(2)(vi)(c), 1910.252(d)(2)(xiii)(a) and 1910.252(d)(2)(xiv)(c)(3). The second

alleges an "other" violation of 29 C.F.R. § 1910.252(d)(3)(i).[1]

Respondent timely contested all items of both citations and a hearing took place in Dallas, Texas. The Commission's jurisdiction is not in issue. Only Respondent filed a post-hearing brief.

Background

Respondent has owned and operated the Sherman plant since October, 1987. Before Respondent purchased the plant, the owner was Anderson Clayton Foods. The facility refines and blends edible oils to make margarine, salad dressing and other products. It has various processing departments, including hydrogenation, bleaching, and mixing areas. Employees called oil pumpers are responsible for mixing oils and transferring them to different areas in the plant through a pipeline system. After a transfer, air is blown through the lines to clean them. Valves in the lines direct and block the flow of oil and air through the system. (Tr. Vol. I, pgs. 12-13; 20-22; 34; 46-49; 67; 171; Exh. R-1; R-2).

For several weeks before the accident, the plant was undergoing "kosherization," which involved cleaning and separating transfer lines to ensure animal oils were not mixed with vegetable oils. It also involved removing unused three-way valves. On April 2, 1988, two of Respondent's maintenance employees, Daniel Cunningham and Michael Bartholomew, were engaged in removing a valve from an overhead line in the hydrogenation area. Oil escaped from the line, vapor appeared and a fire exploded, causing

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[1]The specific language of the allegations as set out in the citations appears infra, in the opinion portion of this decision.

Cunningham's death and severe burn injuries to Bartholomew. (Tr. Vol. I, pgs. 23-26; 32; 44; 51-52; 76; 99-103; 148-150; Vol. II, pgs. 29-30).

The Evidence

Michael Bartholomew testified. From October, 1987, up until the time of the accident, he was an apprentice mechanic in the maintenance department of the Sherman plant. He is currently a truck driver at the plant, the position in which he has worked for about 13 years. (Tr. Vol. I, pgs. 70-72).

Bartholomew explained that on April 2, 1988, he and Cunningham were assigned to remove a valve in the hydrogenation department pursuant to a work order and instructions from their foreman, Mike Nowlan. He had done this kind of work a number of times, although not with Cunningham. They could not start the job that morning because James Hayden, an oil pumper, was using the line to pump oil. At 12:30 p.m., Paul Montgomery, the process shift supervisor, told them the line was ready. They began the removal job at 1:00 p.m. (Tr. Vol. I, pgs. 72-77; 85; 88-89; 93-94; Exh. R-3).

Bartholomew's job was to help Cunningham, a journeyman mechanic. The valve they were to remove was on a line which crossed over the center of a tank. The tank was about four feet high. Both he and Cunningham were on top of the tank, and Cunningham was using an acetylene torch to cut the bolts from the valve. He had cut three bolts and started on the fourth when the gasket between the valve and the line broke loose and oil, about a quart, ran out of the line and onto the floor for about 60 seconds.

Bartholomew said the gasket exploded into flames and fire spread towards him. He tried to jump off the tank, but was unable to do so before the fire reached him. (Tr. Vol. I, pgs. 72-76; 98-104).

Bartholomew was in the hospital for several months after the accident. He said that in July or August, 1988, Bill Wardlaw, the maintenance superintendent at the time of the accident, visited him in the hospital. Wardlaw said he'd seen a training film after the accident about a similar occurrence in another plant in which four men had died. Bartholomew thought Wardlaw said the plant was in Pennsylvania, but was not sure since he was "pretty doped up" at the time. Wardlaw told him that based on the film, he thought the accident was caused because the oil pumper, instead of turning off the air pressure in the line, had blocked the line with a valve to keep air out of the section being cut into. However, there was still air pressure in the line, as well as oil. When the line opened, the air and oil atomized and the cutting torch caused an explosion. Bartholomew said Wardlaw wanted him to see the film; however, when he got out of the hospital, Wardlaw no longer had it. (Tr. Vol. I, pgs. 79-83; 86-87; 104-05; 108-110).

James Hazelwood also testified. He is the process superintendent at the Sherman plant. He has been at the plant since 1965 and has overseen product processing since 1974. He arrived at the scene within 30 minutes of the accident. The fire department had just extinguished the fire, and there was thick, black smoke in the area. He saw air and mist blowing out of the cut valve, which was on an overhead line seven or eight feet from

the floor. The mist was not burning, and he saw no oil underneath the valve. The acetylene torch head and hose were on the floor below the valve; the hose was burned. The cutting rig was about 30 feet southeast of the site. The temperature had melted metal covering on insulation about two feet away from the site and splattered it on walls ten to twelve feet further away. There was burn damage eight to ten feet east and ten to twelve feet west of the site, as well as damage six to eight feet south and two to four feet north. There was also burn damage to the ceiling, which is 15 feet above the pipe and 22 to 23 feet above the floor. (Tr. Vol. I, pgs. 19-20; 26-29; 31; 54-60).

Hazelwood investigated the accident. He traced the line from the cutting operation to determine the source of the air and found it came from kettles 18 and 19. He learned corn oil was transferred from those kettles to kettle 376 prior to the cutting operation. He said Charles Manhart had handled the transfer. His opinion was that a valve setting had been changed by mistake, which directed air to the cutting operation. Although there was pressure in the line, he was not able to determine the amount. (Tr. Vol. I, pgs. 27; 29-31; 35-38; 54; 57; 62).

Hazelwood's findings are on Exhibit C-1, a diagram he drew of the site. He marked C-1 with a red "X" to show where Manhart had worked and a red "Y" to show where Cunningham and Bartholomew had worked. He also drew an orange line on C-1 to show the common transfer line, which ties into other lines and transfers oil throughout the plant. (Tr. Vol. I, pgs. 25-30; 33; 41; 54).

Hazelwood described plant procedures. Maintenance employees ask the process shift supervisor for permission before beginning work in the area, which ensures transfer does not take place through lines being cut into. The shift supervisor controls transfer orders, which instruct oil pumpers to move oil through particular lines. Oil pumpers are responsible for setting valves and turning on and off the air that blows through the lines. At the end of a shift, the pumper writes down any ongoing operations in a log. This tells the next pumper what transfers are taking place and whether there is air in the lines. Hazelwood said these procedures were in effect at the time of the accident, and are still in effect, although they are more documented now. Prior to the accident, there was no procedure to advise an incoming pumper whether cutting or other work was being performed on the lines. Since the accident, the plant has implemented line-tagging and hot work procedures for cutting and welding work. (Tr. Vol. I, pgs. 35; 39-49; 53; 63; 68; Exh. R-1; R-2).

Hazelwood testified the hazard of cutting into lines during transfer would be that of warm oil getting on the workers. He said oil moving through the lines ranges from ambient temperature to 140 or 150 degrees, and that the flash point for corn oil is around 600 degrees. He explained that line entry is a common procedure, and that during kosherization, valve replacement had taken place in the process area 20 to 25 times. Although he did not supervise Cunningham and Bartholomew, he knew they had performed valve replacement several times before. He said that in the 23 years he

had been at the plant, to his knowledge there had never been a similar accident. (Tr. Vol. I, pgs. 23; 32; 37; 51; 57-58; 62-63).

James Hayden, the oil pumper who transferred the oil prior to the accident, testified. He said he initially blocked the line on either side of the section where the cutting work was to take place. He unblocked it when Montgomery told him he had to use the line, and told Cunningham and Bartholomew not to use it. When Hayden left at noon, the end of his shift, oil was not going to the section, but it was still unblocked. He could not remember if he told Manhart, the incoming pumper, about the cutting operation. Hayden marked two red "A's" on Exhibit C-1 to show the location of the valves he used to block off the line for the cutting operation. He also drew red arrows on C-1 to show the direction of the oil he pumped. He said the oil's temperature was between 110 and 120 degrees. (Tr. Vol. I, pgs. 112; 114-23; 126-31).

Charles Manhart, the oil pumper who relieved Hayden at noon on April 2, 1988, testified. To the best of his recollection, air was blowing from kettles 18 and 19 at that time, but no oil was pumping. He said air blowing through the lines is common, since it cleans them after transfer, and does not signify any danger. He did not turn the air off. He said he could have adjusted the valve, which he showed with a black "X" on C-1, to divert air to the common transfer line, but that doing so is not unsafe. (Tr. Vol. I, pgs. 132-34; 137-38; 141-43; 145-46; 168-70).

Manhart was mixing oil at the time of the accident. He was 30 to 35 feet from Cunningham and Bartholomew and had a clear view of

them. He had to go where they were to open a valve so he could finish his mix, and since he didn't know what they were doing, he was going to ask them. He started towards them; when he was about halfway there, he heard a pop and a hiss and saw vapor rising from the floor. He thought the two employees were standing on the floor, but said they could have been on the tank. He saw Cunningham holding the torch, which was shooting a flame of eight to ten inches. A fireball suddenly appeared, about ankle to chest size. Cunningham reeled back, and to Manhart, it seemed he was trying to reach over and cut the torch off at the tank. Then there was an explosion and the fire went from the floor to the ceiling. Manhart described it as a huge, intense wall of fire with black smoke at the top, moving towards him with a roaring noise. He said it happened suddenly, in about a second and a half. (Tr. Vol. I, pgs. 146-150; 156-63).

Manhart looked over his shoulder as he ran from the fire. Although he had not seen one before, he thought it might have been an acetylene explosion, and was afraid the rig would blow up and hit him. The rig, which is a portable cart holding a bottle of oxygen and a bottle of acetylene, was five to ten feet from where Cunningham and Bartholomew were working. Manhart said he had used acetylene torches to weld and to thaw out lines that had "set up" with product. (Tr. Vol. I, pgs. 160-63; 166-68; 170-71).

Thomas Smith, the compliance officer ("CO") who inspected the worksite, testified. He has four years of CO experience and has had OSHA training dealing with flammables and explosives. Smith

said that when he saw the site, it was cleaned up and the only sign of an accident was the scorched tank. He also saw the welding rig; it had not blown up. He discussed the possibility of an acetylene fire with company officials, but concluded the properties of the blaze indicated a vegetable oil fire rather than an acetylene fire. (Tr. Vol. I, pgs. 174-79; 182-83; 209).

Smith's opinion was that an explosive atmosphere was created when the torch heat vaporized residual corn oil in the line, which mixed with pressurized air; when the valve opened, the torch ignited the oil and air rushing out, causing the fire. Smith said there was between 60 and 80 p.s.i. of air pressure in the line, but that it was not necessarily moving the oil. He also said the oil was not normally explosive, but became so when torch heat was applied. When asked if he had determined the flammable properties of vegetable oil, he said that "just about anything can burn" and that "vegetable oils are pretty much known to burn." He also described how cooking accidents involving vegetable oils occur in the home. (Tr. Vol. I, pgs. 180-85; 204-08).

Smith said corn oil has a flash point, which he defined as ignition temperature, of roughly 550 degrees. He also said liquids in mist or spray form can ignite at temperatures below their flash points. He relied on the National Fire Protection Association Fire Protection Guide on Hazardous Materials ("NFPA Guide") to arrive at this conclusion. He believed the oil misted because of the acetylene torch heat, which he said would be around 4000 degrees. Smith has no schooling in thermodynamics and had performed no

calculations to arrive at this conclusion. He recommended the citation because of the explosion. (Tr. Vol. I, pgs. 199-202; 208-10; Vol. II, pgs. 103-04; Exh. C-2).

Paul Montgomery, the process shift supervisor on duty the day of the accident, testified. He said Cunningham and Bartholomew talked to him about the valve job that morning. He gave them clearance to work on the line about 1:05 p.m., since it was no longer needed for transfer. He did not recall advising his pumpers about the line work. (Tr. Vol. I, pgs. 224-25; 227-29; 237-38).

Leroy Smith testified. He has worked at the Sherman plant for over 21 years; for 18 years, he was in maintenance. He has been a manufacturing engineer for two years; prior to that, he was the plant's maintenance superintendent. (Tr. Vol. II, pgs. 32-33).

Smith investigated the site shortly after the accident. There had been extreme heat, and the site was surrounded by a blackened 30 to 40-foot circle. Conduit and electrical wiring in the area had melted, and insulation was burned off the lines. Smith used an explosion meter to determine whether there were any explosive gases in the area, and found none. He also inspected the plant's hydrogen gas piping system, and found there was no way it could have connected with the system involved in the accident. (Tr. Vol. II, pgs. 56-57).

Smith was present during Bartholomew's conversation with Wardlaw. Wardlaw said a corn oil sample had been sent for testing, and that it was very possible the oil caused the accident. Smith explained Wardlaw was not at the hearing because he was in the

hospital with chest pains. He said Wardlaw had never showed him a tape about an accident in Pennsylvania, and that he was unaware of any such tape. (Tr. Vol. II, pgs. 53-56; 63-64).

Smith said the corn oil sample was sent to Southwest Research Institute ("SRI"), where it was subjected to pressure and cutting torch heat to determine its flammability. He identified Exhibit R-12 as SRI's test results, and said there was also a video demonstration of the results. Smith stated the only time he had seen corn oil burn was in the video, after it was heated to a high temperature. He said the flame was three feet at the most, with a yellowish tint and no smoke. (Tr. Vol. II, pgs. 49-51; 60-61).

Smith has seen acetylene leak from a torch rig where the hose connects onto the cutting tip. He explained that when this happens, the acetylene "flares off" with a yellow flame and lots of black smoke when the torch is lit. Smith thought the temperature of an acetylene torch was around 1700 degrees. He said torch heat generally will not transfer to a pipe during a bolt-cutting operation because of the speed of the operation and the mass of the bolt. He had touched pipes shortly after bolts had been cut, and felt nothing more than the normal operating heat. He said it was possible to hold a torch flame to a pipe and heat corn oil to 300 degrees. (Tr. Vol. II, pgs. 58-62; 71-72).

Jack Hanson testified. He has worked for Respondent in the area of safety for 15 years and is currently the corporate director of safety. He has an undergraduate degree in mechanical engineering and manufacturing technology, and master's degrees in

industrial operations and industrial safety. He has several years of teaching experience in the areas of welding, fire protection and safety engineering. He also has several years of welding and cutting supervisory experience. (Tr. Vol. II, pgs. 72-75).

Hanson viewed the accident scene on April 4, 1988. He also reviewed all of the written statements of witnesses and was involved in the decision to test the corn oil. He discussed the SRI test results. They showed the oil's flash point was 610 degrees and that it was ignitable in mist form when heated to temperatures in excess of 300 degrees. Hanson defined flash point as the temperature at which a flammable liquid gives off vapor in sufficient concentrations to form an ignitable mixture. He said there was a video of the test results, which he and other company officials saw. He described the oil mist flame as a narrow two to three-foot concentration, like a torch, that quit burning when heat was removed. (Tr. Vol. II, pgs. 77-80; Exh. R-12).

In forming an opinion about the cause of the accident, Hanson considered whether the corn oil mixture had ignited upon contact with the torch heat. He rejected this possibility because the oil was about 110 degrees in the line, and the test results showed it would have to be over 300 degrees to be ignitable. He said it was highly unlikely the torch could have heated the oil to 300 degrees because of the mass of the bolts and the fact the torch heat would have been concentrated on the bolts. He noted welders can actually place their hands on pipes from which they are cutting bolts and not sense any high temperatures. (Tr. Vol. II, pgs. 81; 83-84).

Hanson also considered the possibility of an acetylene explosion and discussed what he believed was the most likely cause of the accident. He said that during the operation, Cunningham might have swung or dropped the torch, or draped it over something, such that it contacted the acetylene hose; if this occurred, it was very probable the torch cut through the hose and acetylene vented into the air, causing an explosion. Hanson said this possibility was in line with the physical characteristics of acetylene. (Tr. Vol. II, pgs. 81-83; 87-88).

Hanson discussed Exhibit R-9, the material safety data sheet ("MSDS") for acetylene. It states that acetylene ignites very easily, is highly flammable and explosive, and burns with an intensely hot flame. Hanson said witness descriptions of a sudden ball of fire, an explosion, and a very rapid, intense fire are characteristic of an acetylene explosion. He also said when he viewed the scene, it looked as though there had been intense heat resulting from an explosion. Based on the test results, he did not believe corn oil would have caused the same kind of fire because it burns like a blowtorch, rather than a fireball, and is not self sustaining. His opinion was that the corn oil was not flammable under the circumstances and that the accident was caused by an acetylene explosion. He said the explosive atmosphere was the result of an unfortunate accident. (Tr. Vol. II, pgs. 78; 88-91; 96; 98).

BURDEN OF PROOF

The Secretary has the burden of proving each element of his case by a preponderance of the evidence. Astro Pharmaceutical Products, Inc., 9 BNA OSHC 2126, 1981 CCH OSHD ¶25,578 (No. 78-0647, 1981), aff'd in pert part, 681 F.2d 69 (1st Cir. 1982).[2]

PRELIMINARY FINDINGS

The standard governing this action contains terms such as "explosive atmospheres", ''fire potentials", "combustibles", and "flammable materials". It does not contain definitions of those terms, but it does list parenthetically examples of "explosive atmospheres" to be "(mixtures of flammable gases, vapors, liquids, or dusts with air)." In defining the words "flammable or combustible" when used in another standard, the Commission has looked to the dictionary for definitions thereof,[3] to the flashpoint of the liquid involved, and to fire hazard ratings.

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[2]Those elements are that (i) the cited standard applied to the factual situation, (ii) there was a failure to comply with that standard, (iii) there was employee access to the violative condition, and (iv) the cited employer either knew or could have known of the violative condition with the exercise of reasonable diligence.

[3]See Webster's Third New International Dictionary (1971). It defines "flammable" as capable of being easily ignited and of burning with extreme rapidity... compare combustible, explosive..." "Combustible" is defined as "capable of undergoing combustion or of burning - used esp. of materials that catch fire and burn when subjected to fire..." An "explosive substance" is defined as one "that on ignition by heat... undergoes very rapid decomposition (as combustion) with the production of heat and the formation of... products (as gases) which exert tremendous pressure as they expand at the temperature produced;..."

Anoplate Corp., 86 OSHRC 9/A3, 12 BNA OSHC 1678, 1690, 1986 CCH OSHD ¶27,519 (No. 80-4109, 1986).[4] In short, the Commission initially looked for the usual meaning of such words as "flammable", then to the specific properties of the substance at hand, and finally evaluated the foregoing in the context of the factual situation at the workplace. The examples of an "explosive atmosphere" set forth in the standard are self-explanatory and in harmony with the dictionary's definition thereof, rendering further discussion of its meaning unnecessary.

The flashpoint of corn oil is 610 degrees Fahrenheit ("°F")[5] (Tr. Vol I, pgs;. 57-58 Vol. II, pgs. 50-51; 79-80, Exh. R-12). The flashpoint can be reduced by heating the liquid (corn oil) and creating tiny droplets mixed with air, misting, spraying or frothing. (Tr. Vol. I, pgs. 204-205; Exh. C-2). The evidence established that, in mist form, the flash point is not reached until it is preheated to a temperature in excess of 300 degrees. (Ex. R-12). Corn oil is transferred through the lines at approximately 110-120°F (Vol I, pg. 130).[6] At a minimum, the heat

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[4]In ascertaining the flashpoint and fire hazard rating of certain materials, the Commission referenced N. Sax, Dangerous Properties of Industrial Materials (5th ed. 1979) and the National Fire Protection Association ("NFPA"), Fire Protection Guide on Hazardous Materials.

[5]It is clear that the CO's figure was an estimate based on a somewhat sketchy memory. (Tr. Vol. I, pg. 199).

[6]In so finding, I have not overlooked Hazlewood's comments of that temperature being between the ambient temperature and 140-150°F (Vol. I, pgs. 37, 57). Obviously, his remarks represented the possible variance, depending on the liquid involved, while Hayden's testimony was focused on this corn oil.

emanating from the acetylene torch was over 1000 degrees higher than the flashpoint of the corn oil.[7] At the time of the accident, the line contained "some" corn oil and there was air pressure in the subject line, estimated at 60-80 pounds per square inch ("psi") (Vol I, pgs. 27-31, 35-36, 54-57, 62, 79, 83, 184, 209).

CITATION 1, ITEM 1

This item alleges that § 1910.252(d)(2)(vi)(c) was violated (welding or cutting performed in the presence of explosive atmospheres) when employees used a cutting torch to remove bolts from a valve flange in the overhead pipe system while that system contained an air/vegetable oil mixture under pressure of 60-80 psi.

Much of the controversy in this case revolves around the "explosive atmosphere" issue. The CO's recommendation that this citation be issued was based upon his belief that the work situation produced an explosive atmosphere. In so doing, he assumed that, once the flange gasket moved, an opening was created for a mist of oil (created by corn oil, air pressure and heat) to be forcibly discharged therefrom, coming in contact with the cutting torch and causing a huge fireball (explosion). (Tr. Vol. I, pgs. 180-185; 204-205; Vol. II, pgs. 103-104; Exh. C-2). Respondent's contentions to the contrary (an explosive atmosphere

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[7]There was a great range in the testimony relating to the heat of the torch. (Tr. Vol. 1, pg. 202; Vol. II, pg. 71). Based on work experience, it appears that the testimony of Leroy Smith should be more credible (approximately 1700°F). However, his testimony lacked preciseness. Obviously, the heat emitted by such a torch would be governed by several variables; and none of the witnesses touched on any of such particulars (size of tip on torch, volume of gas fed into the torch, etc.)

did not exist or did not develop) are centered on two principal areas. Those areas are primarily composed of certain statements by the CO on the subject matter as measured against the testimony and opinions given by Hanson thereon. (Respondent's brief, pgs. 29-32).[8] However, in resolving this issue one need look no further than the testimony of eyewitnesses. As Bartholomew stated, when three of the four bolts had been cut (attaching and securing the valve to the pipe), the line unavoidably shifted some, oil started escaping and just then the gasket between the valve and line exploded into flames. (Vol. I, pgs. 75-79; 98-101). Manhart was a short distance away from the mechanics and walking toward them as the accident unfolded. (Vol. I, pgs. 146-147; 151-152; 155; 157-158). After hearing a pop and a hiss, he then saw vapors rising (apparently) from the floor. At that point, he saw the torch flame, 8-10 inches long, while still seeing the vapors rise and hearing a continuous "shhhh" sound; then a small fireball suddenly appeared between chest and ankle level (approximately 3 feet); and, after that, a far more extensive explosion took place. (Tr. Vol. I, pgs. 148-150; 152; 157-163). Hazlewood arrived at the accident scene within thirty minutes. He could see an oil mist coming out of the west side of the flange (Tr. Vol. I, pgs. 27-28, 35-36, 54-55).

I find the standard's requisite of the presence of an explosive atmosphere or a situation where an explosive atmosphere

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[8]In so doing, the Respondent mistakenly focuses on <u>how</u> this explosion occurred rather than <u>was</u> the hazard which the regulation sought to prevent presented by virtue of the work situation.

may develop has been fulfilled by the facts of this case. Initially, I observe that one need not possess any particular skills in metallurgy to resolve this issue.[9] Under the circumstances herein, it is foreseeable that the line and gasket might move, permitting anything therein (air and oil) to escape.[10] Respondent's argument centers on a lack of evidence showing the existence of an oil mist. In so doing, it relies heavily on a lack of any eyewitness testimony about mist at or before the accident. (Respondent's Brief, pg. 30, para. 2). This reliance is misplaced. It is true that neither Bartholomew nor Manhart mentioned mist in their testimony. However, they were not asked about its presence either. Even assuming that if asked they would have so testified, could a reasonable man question why they might overlook mist in this factual situation and their respective locations.[11] Also, no explanation is offered by Respondent for the presence of mist after the accident if none was present before or during the accident. (Tr. Vol. I, pgs. 27; 54-55; 57). Additionally, when the pipe moved and oil began to escape at the gasket, the heat emanating from the torch could easily have raised the temperature (of corn oil) at or above misting and/or ignition levels. In fact, the

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[9]It is well settled that a judge's findings can properly be based on reasonable inferences drawn from circumstantial evidence. See Okland Construction Co., 3 BNA OSHC 2023, 1975-76 CCH OSHD ¶20, 441 (No. 3395, 1976).

[10]Indeed, any householder, who has dealt with routine plumbing problems, would not be surprised by this result.

[11]The fact that some oil initially escaped in liquid form does not preclude the possibility of a mist also being present then or developing immediately thereafter.

torch could have come into direct contact with such oil or the vapors therefrom. Certainly, the emergence of such circumstances is foreseeable. The existence of the hazard and the breach of the standard have been established. Obviously, there was worker exposure to the hazard.

Without any doubt, the evidence clearly establishes that an acetylene fire/explosion did occur.[12] What Respondent's argument fails to overcome is the possibility that a corn oil fire/explosion was or could have been the precipitating factor in this chain of events.[13] Even Respondent's corporate director of safety (Hanson) admitted that this was one of several possibilities. (Tr. Vol. II, pgs. 72-73; 80-83).[14] Thereafter, he went on at some length to state reasons why he did not believe the corn oil was the likely cause (''the how'') of the acetylene explosion.[15] (At the same time, he was unable to rule it out.) (Tr. Vol. II, pgs. 83-91). Unfortunately, the Court had no opportunity to listen to testimony by the research engineer (Eugene L. Anderson) or to view the video tape of the test which he conducted. However, it is noted that the

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[12]The large explosion (third stage) clearly fits within the expected results from such an ignition.

[13]Despite Hanson's testimony, I find it likely that the second-stage fire/explosion was due to the ignition of corn oil vapors. Whether it was or not, such a hazard existed.

[14]On several occasions, he acknowledged that the exact causative factor was uncertain. (Tr. Vol. II, pgs. 81; 83; 91).

[15]I cannot conceive of anyone, lay or expert, willing to place himself in the work situation of the exposed workmen, with corn oil escaping in a work area while they were holding a torch emitting heat of approximately 1700°F.

air pressure in the subject line (60-80 psi) was higher than the pressure present in the test (50 psi). The heat of the torch at the workplace was vastly hotter than the heat employed in the test. Also, the size of the venting (prior to explosion) may been quite different than that used in the test. Moreover, the little or small fireball seen by Manhart (second stage of chain reaction) was approximately the same length as the plume described in the test. (Tr. Vol. I, pgs. 146-150; 157-159; Exh. R-12). I have not overlooked the possible differences in shapes described by Manhart (fireball-ankle to chest level) as contrasted to the one described in the test result (plume) or by Hanson's viewing of the video (narrow). (Tr. Vol. I, pgs. 149-150; Exh. R-12; Tr. Vol. II, pg. 80). If not semantical in nature, then any actual difference in the shape of the fires could have resulted from possible differences in work and test conditions. In any event, the hazard of an explosive (mixture of flammable gases, vapors, liquids with air) atmosphere is well established in this case. The fact that an acetylene explosion dwarfs a corn oil explosion does not alter the essence of the latter.

In its brief, Respondent argues that the evidence does not establish employer knowledge. To establish knowledge, the Secretary must prove that a cited employer knew, or with the exercise of reasonable diligence, could have known of the presence of the violative condition. United States Steel Corp. 12 BNA OSHC 1692, 1986-87 CCH OSHD ¶ 27,517 (No. 79-1998, 1986). Either actual or constructive knowledge of an employer's foreman can be imputed

to the employer. Dun Par Engineered Form Co., 12 BNA OSHC 1962, 1986-87 CCH OSHD ¶ 27,651 (No. 82-0928, 1986). Additionally, Respondent cannot (successfully) close its eyes to the inadequacy of a safety plan or the ineffective implementation of an adequate safety plan to avoid the doctrine of constructive knowledge.

The Respondent argues that there is a lack of evidence to establish knowledge on its part, contending that the accident resulted from a mistake of which its supervisors were unaware. It states that all of the existing procedures were designed to prevent such an occurrence, pointing out that line entry procedures attached to the work order were designed to prevent work on any type of line in use. (Respondent's Brief, Pgs. 35-36).

There are significant conflicts in Respondent's safety policy versus actual work practice. In addition, there are significant differences in testimony concerning the events of the day of the accident. In resolving those conflicts (in critical areas), I have evaluated witnesses by their personal demeanor on the stand, together with possible motivating factors. By using those measurements, three witnesses stood out above the others. They were Bartholomew (mechanic)[16] and pumpers Hayden and Manhart. Without reservation, those three individuals left an impression of sincerity and honesty. I was unable to detect any personal agenda on their part.

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[16]I hasten to add that, despite the foregoing, I was unable to give any weight to his testimony relating to a conversation with Wardlaw about the cause of the accident. By his own admission, he was heavily sedated at the time.

The first matter to be resolved is the genesis of this accident. It is not shrouded in mystery. Very simply, the mechanics came to the process area during the morning hours with a work order, requesting permission to enter a line and remove a valve. Ultimately, they were told that there would be a delay until after lunch, resulting from the use of the line by the pumper. The pumper, Hayden, had been instructed by Montgomery (process shift supervisor) to transfer a certain product over that line past the valve where the accident occurred.[17]

Obviously, to carry out that assignment, any existing blocks of the valve had to be removed. Hayden's shift was over at noon.[18] He had completed the transfer, but the valve remained unblocked. His relief, Manhart, came on duty at noon. Manhart received the log from Hayden. Manhart had some difficulty remembering whether any oil was being pumped when he arrived, but believed there was

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[17]Earlier the mechanics had asked Hayden if the line was in use. When told that it was not, they requested that he block the valve so they could make entry to remove the valve. He did so, but then told Montgomery who directed him to tell the mechanics to stay off (the line), as it was going to be used for a transfer of oil. At about 11:00 a.m., Hayden told the mechanics and he then unblocked the line. He transferred the oil, but did not replace the blocks (Tr. Vol. I, pgs. 115-118; 125-130). Bartholomew confirms that the mechanics requested that Hayden isolate the valve; but, prior to the time that the mechanics got started, Montgomery stated that the job had to be delayed. (Tr. Vol. I, pgs. 87-88).

[18]When a pumper has completed a shift, he writes up a log to give to the next pumper, indicating what products are in the process of being transferred (from where to where) at that time, and where air is turned on in the lines. (Tr. Vol. I, pgs. 40-43; 125; 134; 137; 154). However, the log would not notify a pumper whether cutting or welding operations were taking place. (Tr. Vol. I, pgs. 40; 43; 144-145;. 154-155).

not. However, he specifically recalled that air was turned on the subject line. He did not turn it off since it is not unusual for air to be on for various reasons, including the cleansing of a line after a transfer. There is nothing wrong in letting it blow. (Tr. Vol. I, pgs. 125; 134; 137-138; 142; 168-170; 173). Manhart had no knowledge that the mechanics were going to work on the line in question. (Tr. Vol. I, pgs. 144-45; 150-52; 155).

Subsequent thereto (the precise time is not important) Montgomery told the mechanics that it was all right to proceed on the line entry to remove the valve. (Tr. Vol. I, pg. 85) They did so and the accident occurred.[19]

Montgomery, the process shift supervisor, was the only person of those involved who knew both that the valve was unblocked (had been unblocked) and that clearance was being given for mechanics to enter the line. Due diligence mandated that he make certain the air was not on the line and valve blocks had been restored. He did neither. His knowledge of the facts is imputed to the Respondent. Despite Respondent's argument concerning the strength of its safety program, close scrutiny thereof reveals it was lax in actual practice.[20]

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[19]In so finding, I note that Hazlewood characterizes the accident as arising from a mistake on the part of Manhart. (Tr. 37-38; 62). His approach ignores the real hazard in this case (inadequate procedures and rules).

[20]The evidence establishes that even when valves are blocked, there is still a possibility of air escaping through them. This is a result of the use of older valves, yet another safety problem. (Tr. Vol. I, pgs. 140-42).

Montgomery admitted that he did not attend all of the safety meetings for department supervisors. He did not know with what regularity safety meeting were held, and had never attended safety meeting with pumpers. (Tr. Vol. pgs. 233-37). It has not gone

The Respondent's affirmative defense of employee misconduct is rejected. There is no reason to rehash the Respondent's work policies, procedures, and work rules. They were inadequate in this situation. Those they did have were abridged to some degree by informal practice. Finally, Respondent offers no evidence of disciplinary action as a result of the conduct on this day. (Tr. Vol. I, pgs. 44-45; 107; 165; 236). This defense fails for obvious reasons.

Under the facts and circumstance of this case, I find a serious violation of the cited standard. In light of the record and statutory penalty criteria set forth in § 17(j) of the Act, I conclude that a penalty of $560.00 is reasonable and appropriate.[21]

CITATION 1, ITEMS 2 AND 3

These items allege violations of § § 1910.252(d)(2)(xiii)(a)

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unnoticed that, while safety meetings of maintenance department workers are well documented in this case, there is a complete lack thereof regarding the processing department. (Exh. R-6).

Another example involves the statement by Leroy Smith (manufacturing engineer) that (i) it was normal procedure to attach a ''standard procedure list'' to a work order at the time of the accident, and (ii) the one found in Exh. R-3 (the subject work order) was attached thereto and used. (Tr. Vol. II, pgs. 42-47; 64-67). More convincing testimony was given by Bartholomew who testified that mechanics were never given said list. Even Montgomery so testified. (Tr. Vol. I, pgs. 93-96; 238-239). I so find.

Finally, the informal practice employed by most mechanics of usually contacting pumpers to let them know the they planned to work on a line is some evidence of a tacit understanding by mechanics that the Respondent's safety policy was something less than foolproof. (Tr. Vol. I, pgs. 117-119; 123-124; 143-144). Surely, Montgomery was aware of that practice or could have been with the exercise of due diligence.

[21]One single penalty is being imposed for the three violations cited in citation 1.

and 1910.252(d)(2)(xiv)(c)(3). In substance, the second item alleges that management did not establish (adequate) procedures for cutting and welding based on the fire potentials in the plant. The third item relates to the supervisor's failure to schedule such activities so that they did not expose combustibles to ignition.

Respondent's arguments have been carefully considered. (Respondent's brief, pgs. 32-34). Again, they are not convincing. The findings of fact made in the sections entitled ''PRELIMINARY FINDINGS'' and ''CITATION 1, ITEM 1'' are incorporated herein by reference. They are fully sufficient to establish violations of the sections cited in items 2 and 3 of citation 1. I so find.

It is noted that the violative conditions of all three citations items could be and have been corrected by the same abatement steps. (Tr. Vol. I, pgs. 41-44; 144; 153). For such circumstances, it is discretionary whether a single penalty is assessed for such overlapping violations. In this case, I find it appropriate and the penalty for all three items is merged into one penalty, of $560.00.

CITATION 2, ITEM 1

This citation alleges that the subject pipe section, containing flammable materials (vegetable oil), had not been blanked (blocked) prior to hot work (cutting by welding torch) commencing on the line. Again, incorporating by reference those facts found in sections entitled ''PRELIMINARY FINDINGS'' and ''CITATION 1, ITEM'' 1 leads to the conclusion that the violation has been established. No penalty was proposed, and none is assessed.

FINDINGS OF FACT

All findings of fact relevant and necessary to a determination of the contested issues have been found specially and appear above. See Rule 52(a) of the Federal Rules of Civil Procedure. Proposed findings of fact or conclusions of law that are inconsistent with this decision are DENIED.

CONCLUSIONS OF LAW

1. At all times material thereto, Respondent was an employer within the meaning of § 3(5) of the Act, engaged in a business affecting commerce, and having employees.

2. The Commission has jurisdiction over the parties and subject matter of the proceedings.

3. Respondent was in serious violation of 29 CFR §§ 1910.252(d)(2)(vi)(c), 1910.252(d)(2)(xiii)(a) and 1910.252(d)(2)(xiv)(c)(3).

4. Respondent was in nonserious violation of 29 CFR 1910.252(d)(3)(i).

ORDER

Upon the basis of the foregoing findings of fact, conclusions of law, and the entire record, it is ORDERED that:

1. To the extent that the Respondent's proposed findings of fact and conclusions of law are inconsistent with this decision, they are DENIED.

2. Item 1 of citation 1, alleging a serious violation of 29 CFR 1910.252(d)(2)(vi)(c), is AFFIRMED.

3. Item 2 of citation 1, alleging a serious violation of 29

CFR 1910.252(d)(2)(xiii)(a), is AFFIRMED.

4. Item 3 of citation 1, alleging a serious violation of 29 CFR 1910.252(d)(2)(xiv)(c)(3), is AFFIRMED.

5. A single civil penalty of $560.00 is ASSESSED for the three violative conditions enumerated in the foregoing paragraphs (2, 3 and 4).

6. Item 1 of citation 2, alleging a nonserious violation of 29 CFR 1910.252(d)(3)(i), is AFFIRMED. No penalty is assessed.

E. Carter Botkin

E. CARTER BOTKIN
Administrative Law Judge

Date: JAN 10 1992

APPENDIX

The Standards

(a) Serious Citation

1910.252 Welding, cutting and brazing.

* * *

(d) Fire prevention and protection--

* * *

(2) Special precautions. When the nature of the work to be performed falls within the scope of subdivision (ii) of this subdivision certain additional precautions may be necessary:[1]

(vi) Prohibited areas. Cutting or welding shall not be permitted in the following situations:

* * *

(c) In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.

* * *

(xiii) Management. Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and

(a) Based on fire potentials or plant facilities, establish areas for cutting and welding, and establish procedures for cutting and welding, in other areas.

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[1]Subdivision (ii) provides as follows:

Guards If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.

* * *

(xiv) Supervisor. The Supervisor:

(c) Shall protect combustibles from ignition by the following:

* * *

(3) See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.

(b) Other Citation

§1910.252 Welding, cutting, and brazing.

* * *

(d) Fire prevention and protection--

* * *

(3) Welding or cutting containers-
(i) Used containers. No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks or other containers until they have been cleaned so thorouoghly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might product flammable or toxic vapors. Any pipe lines or connections to the drum or vessel shall be disconnected or blanked.