United States of America
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION
1120 20th Street, N.W., Ninth Floor
Washington, DC 20036-3419

SECRETARY OF LABOR, Complainant, v. G & C FOUNDRY COMPANY, Respondent.	OSHRC Docket No. 95-0869

DECISION

Before: WEISBERG, Chairman; GUTTMAN, Commissioner.

BY THE COMMISSION:

The issue before the Commission is whether the Secretary has proven that administrative or engineering controls are feasible to reduce employee exposure to silica dust at G & C Foundry ("G & C"), and whether G & C failed to conduct representative sampling for formaldehyde exposure in its workplace. Review Commission Administrative Law Judge Paul Brady affirmed both citation items, and we affirm the judge.

I. Silica Exposure

A. Facts

G & C, a manufacturer of iron castings, uses two induction furnaces to melt scrap metal and raw materials at its Sandusky, Ohio plant. Each furnace is approximately 36 inches in diameter and 40 inches deep, and has a 9 inch silica lining. Because the silica lining melts over time, the furnaces must be relined every two weeks. This procedure is done on alternate

weekends by two employees. To tear out the old lining, one employee gets inside the furnace and chips away the remaining lining with a pneumatic jackhammer. The furnace is periodically tilted to rake out the loose material, and a large amount of dust is generated as the loose material drops approximately 4-5 feet into a collection bin. After the lining is completely removed, the two employees dump new silica material from 50-60 pound bags into the furnace to form the new lining. All of these procedures cause silica dust to rise into the employees' breathing zone.

Occupational Safety and Health Administration ("OSHA") Compliance Officer Ronald Hoffman tested employee exposure to silica dust on the weekend of January 13 and 14, 1995, in the induction furnace area and found overexposure during both the tearing out and relining processes.[1] The employee who had worked inside the furnace had an exposure level 24.1 times the Permissible Exposure Limit (PEL) of .17 mgs/m³ for silica dust,[2] as

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[1]On the day of the inspection, the two employees relining the induction furnace wore protective coveralls and powered air purifying respirators (PAPRs). This was the first time that such protective equipment was used during the relining of the furnaces. Previously, the employees had only worn disposable paper respirators.

[2] The standard governing exposure to airborne silica provides that:

> **§ 1910.1000 Air Contaminants.**
> . . . .
> (c) An employee's exposure to any substance listed in Table Z-3, in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average limit given for that substance in the table.
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> **Table Z-3- MINERAL DUSTS**

Substance	Mg/M
Silica	
Crystalline:	
Quartz (respirable)	10 mg/m³ / % SiO_2 + 2
Quartz (total dust)	30 mg/m³ / % SiO_2 + 2

calculated by Hoffman. The other employee had an exposure limit 8.54 times the PEL.[3] As a result of these tests, OSHA issued G & C a citation alleging that it failed to use administrative and engineering controls to reduce the level of airborne silica in its workplace.[4]

Hoffman testified about a number of administrative and engineering controls that the Secretary asserted G & C could use to reduce employee exposure to silica during the relining process. Hoffman suggested that the employees could be rotated every two hours, or that one could do the tearing out and the other the relining. He also suggested numerous engineering controls, such as installing some type of an exhaust ventilation system, raising the collection bin so that the chipped material does not fall as far, and using an alternative silica product that contains a dust suppressant. He also proposed using a funnel to lower the loose silica material into the bottom of the furnace or opening the bag at the bottom of the furnace with drawstrings.[5] Lastly, Hoffman suggested utilizing an elliptical flexible hose attached to a ventilation system to draw in the silica dust before it reaches the breathing zone of the employee inside the furnace. Hoffman admitted that this type of hose was tried at another

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[3]Jack Schuldt, the company's safety consultant, also tested the silica exposure and his results were actually higher than those of the compliance officer.

[4]The standard provides that:

> **§ 1910.1000 Air Contaminants.**
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> . . . .
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> (e) To achieve compliance with paragraphs (a) through (d) of the section, administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any equipment and/or technical measures used for this purpose must be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with 1910.134.

[5]The record indicates that the manufacturer of the silica recommends using a funnel to reduce respirable dust and that other foundries use bags of silica with drawstrings.

foundry but had not worked because there was a 10 foot high lift to the furnaces, a problem he noted does not exist at G & C. Hoffman concluded that a combination of these engineering and administrative controls would significantly reduce silica exposure, possibly below the PEL.

James Kontos, a senior mechanical engineer for technical support at the OSHA regional office, testified as an expert on behalf of the Secretary. After inspecting the induction furnaces, Kontos recommended that the company hire a professional engineer to design a ventilation system to remove the silica dust. He testified that such a system would most likely have to be a hood connected by a flexible duct to an exhaust system. The hood would sit on the top of the furnace and capture the loose silica as the employees were working and draw it into the ventilation system.[6]

In order to be effective, the ventilation hood would have to be portable because the employee would have to face the hood at all times. In fact, Kontos testified that two hoods, each 120 degrees of the circumference of the furnace, would be more effective than one hood. He stated that the General Motors Central Foundry ("GM Foundry") in Toledo, Ohio, uses a similar exhaust system,[7] and that although its furnaces are much larger than the ones at G & C, the system could work for any size furnace. Kontos predicted that if G & C used two adequately designed hoods on each furnace during the tearing out and relining processes, respirable silica could be reduced by as much as 95 to 99 percent.

As an alternative to, or in combination with, the hood, Kontos testified that attaching a flexible hose to the hood or to a vacuum would be the cheapest and most practical way to get rid of silica dust. Kontos agreed with Hoffman that a flexible hose would fit inside the furnace with the employee and his tools, and stated that perhaps the hose could be attached to the jack hammer. Positioning the hose inside the furnace would enable the silica dust to

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[6]Kontos made a conceptual drawing of the proposed hood, which he testified was only illustrative of his idea because he did not take measurements or calculate the specifications.

[7]The exhaust system at GM Foundry is in the form of a doughnut, as opposed to a hood.

be removed at the point it is created and before it reaches the employee's breathing zone. Kontos suggested that during the relining stage, the hose could be attached to the side of the furnace so that it could capture the rising silica dust, but not the material necessary to make the new lining.

Jack Schuldt, the safety consultant for G & C responsible for OSHA compliance, assessments, and training, testified that administrative and/or engineering controls were not feasible to achieve compliance with the standard. Schuldt had conducted employee sampling for exposure to metal fumes and silica at the foundry in November 1994 and the results indicated that there was overexposure to silica during the tearing out and relining of the induction furnaces. On December 28, 1994, Schuldt sent a letter to Jeff Carroll, vice-president of marketing at G & C informing him of the test results and recommending that the company purchase air powered respirators for use during the relining of the furnaces. Carroll did so immediately, as evidenced by a purchase order dated January 5, 1995, for protective equipment, including disposable coveralls, PAPRs, and high-efficiency particulate air filters. Schuldt testified at his deposition that he did not know of any feasible engineering solution to the problem of silica overexposure, and that he had suggested the respirators and the protective clothing as an alternative.

Schuldt further testified that while he was working at the GM Foundry,[8] he had attempted to find an engineering solution for a similar silica exposure problem. He testified that the company tried several solutions, such as wetting down the silica, placing an exhaust system in the form of a doughnut around the edge of the furnace, increasing the force of the exhaust system, and placing an elephant hose exhaust down in the furnace with the employee, but that none of those controls were successful in reducing the level of airborne silica to the PEL. The overexposure problem was only solved when employees used air supplied respirators. Schuldt also stated that two years ago the GM Foundry tried another

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[8]Prior to his safety consultant business, Schuldt was the safety director at the GM Foundry for twenty-four years.

exhaust system, also in the form of a doughnut, but that the employees still had to use PAPRs to avoid overexposure to the silica dust. Schuldt concluded that it was not possible to keep an exhaust system between the source of the dust and the breathing zone of the employee working inside the furnace.

Schuldt explained that it would be more difficult to implement similar engineering controls at G & C because its induction furnaces are much smaller than those at GM Foundry, 2 ½ tons compared to 20 tons. G & C's smaller furnaces provide very limited space for the employee inside the furnace with his jackhammer and other chipping tools. He stated that a portable exhaust hood could work, but it would have to be continually repositioned and he doubted that the employees would be able to accurately place it each time. Also, Schuldt explained, anything that impairs the vision or limits the working space could create major problems for the employees and could damage the furnace.

Furthermore, Schuldt testified, an exhaust system such as the one proposed by Kontos would not be able to capture all of the dust because the air from the jack hammer blows it around the entire circumference of the furnace. Capturing the dust would also be a problem during the relining process because the exhaust would remove the new silica material as well as the dust. In addition, Schuldt testified that the exhaust hood would be difficult to place due to the periodic tipping of the furnace and the existence of a charging bucket on a monorail over the furnaces. Schuldt admitted that he had not tried the elliptical hose in combination with the exhaust system because he had tried it at GM Foundry and respirators were still needed. Schuldt also stated that he had tried raising the collection bin but that it was impractical because it required the employees to stand on ladders as they worked. Schuldt ultimately admitted that the amount of silica dust could be reduced if G & C implemented certain administrative and engineering controls, but maintained that the levels of the dust would remain in excess of the OSHA limits.

G & C also presented the testimony of Terry Kette, the vice president of a sheet metal contractor which designs and installs industrial ventilation, who reviewed the proposed hood.

Kette concluded that given the configuration of G & C's furnaces, the existence of the monorail, and the fact that the furnace tips periodically, the exhaust hood and accompanying equipment would be difficult to place. He also stated that the exhaust system would be disturbed by the employee's movements and tools, which would reduce its effectiveness. However, if the hood were put in place, he estimated that it might capture 50 percent of the silica dust.

Charles Carroll, the president of G & C, also testified about the problems in implementing the engineering controls proposed by the Secretary. He stated that the confined space inside the furnace presents problems with any exhaust system, and that Schuldt had looked into several controls but had reported that none were practical. Carroll explained that the employee with the jackhammer must be able to see what he is doing at all times and that an exhaust hose attached to the jackhammer would obstruct the employee's vision. Also, he stated, there would be no way to secure the hose to the jackhammer since the jackhammer vibrates so violently. As for the silica product with a dust suppressant, Carroll explained that the company had talked to the manufacturer and found out that it is more expensive and does not perform as well or have the service life of the regular sand. According to Carroll, the administrative controls suggested by Hoffman, such as rotating employees, are impractical since the furnaces are relined on weekends when few employees are working. However, Carroll admitted that certain things could be done, such as raising the collection bin and using drawstrings or a funnel to lower the new silica material into the furnace, but he believed that those controls would probably only reduce the dust slightly.

B. Discussion

The test of whether administrative and/or engineering controls are technologically feasible is whether the controls are "achievable" and capable of producing a significant reduction in exposure to air contaminants. *Harmony Blue Granite Co.*, 11 BNA OSHC 1277, 1279, 1983-84 CCH OSHD ¶ 26,467, p. 33,649 (No. 14189, 1983). G & C contends that the controls suggested by the Secretary are not feasible because their use would not reduce the

level of silica dust to permissible levels and personal protective equipment would still be required to achieve compliance. However, a control can be feasible under the standard even if it does not achieve full compliance. Section 1910.1000(e) acknowledges that administrative and engineering controls may not always reduce the silica dust level to permissible limits, and requires the use of personal protective equipment to supplement the controls in those cases. *Id.* Accordingly, the standard anticipates the use of respirators in conjunction with administrative and engineering controls.

On this record, we find that the Secretary has established the existence of technologically feasible controls that will significantly reduce the level of silica dust to which employees are exposed. The testimony of Hoffman and Kontos establish that some type of hood exhaust system could be utilized during the tearing out and relining processes to capture the silica dust. Kontos further established that an exhaust doughnut has been effectively utilized in another foundry, although it did not lower the silica dust below the PEL. In addition, G & C admits that it could use either a funnel or drawstrings to dump in the new silica material, thereby reducing the amount of respirable silica. We agree with G & C that the Secretary did not establish the feasibility of several of the proposed engineering solutions in light of the size of G & C's furnaces and the process by which they are relined. However, the Secretary did establish that there are some controls available, *i.e.* an exhaust hood system and drawstrings or a funnel, that will have a significant effect on the amount of silica dust that reaches the employees' breathing zones.

Accordingly, we affirm the citation alleging a violation of section 1910.1000(e).

II. Formaldehyde Exposure

G & C was also cited for failure to sample employee exposure to formaldehyde in the core room and in the cupola furnace area pursuant to 29 C.F.R.§ 1910.1048(d)(1)(iv), which provides that:

> Representative samples for each job classification in each work area shall be taken for each shift unless the employer can document with objective data that exposure levels for a given job classification are equivalent for different work shifts.

A. Core Room

G & C produces cores using a material called Technisand, the material safety data sheet (MSDS) for which indicates that it may release formaldehyde when heated. G & C sampled the formaldehyde exposure in the core room on September 8, 1981, and March 21, 1988, and found the levels below the permissible limits.[9] Under the standard requiring representative sampling, the sample must be "representative of the employee's full shift or short-term exposure to formaldehyde, as appropriate." 29 C.F.R. § 1910.1048(d)(1)(iii). Hoffman testified that the sample tests performed by G&C were for periods of time less than a full shift and that none were designed to determine short-term exposure. G&C contends, however, that the samples were representative of the exposure level in the core room because the production process remains constant throughout the day and the full shift and short-term exposure levels can be calculated from the samples taken.

We agree with the Secretary that G & C's sampling of formaldehyde exposure in the core room did not comply with the standard. The samples taken by G & C were not representative of full-shift or short-term exposure.[10] There was testimony that the process in the core room remains constant throughout the working day, but there is no evidence that the release of formaldehyde remains constant throughout the day or that the levels of formaldehyde remain constant. Additionally, the introduction of two additional core machines since the 1988 sampling qualifies as "a change in production, equipment, . . . which may result in new or additional exposure to formaldehyde," under section 1910.1048(d)(2)(ii), and thus requires new sampling. Although G & C president Charles Carroll testified that the company had increased the amount of room around each core

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[9]After the January 1995 OSHA inspection, Schuldt conducted another test in May 1995, which also did not show an excess of formaldehyde exposure for the length of the test.

[10]Although the record does not reflect which sampling would have been appropriate, full-shift, short-term or both, such a determination is not necessary to find a violation because neither full-shift nor short-term representative sampling was conducted.

machine so that the formaldehyde concentration would not increase with the addition of two more machines, compliance officer Hoffman testified that such a determination could not be made without sampling.

B. Trough Relining

CW Omega Plastic, the material used to reline the trough leading to the cupola furnace, contains formaldehyde. G & C did not conduct any sampling with respect to this material, and argues that it is exempt from the monitoring requirements because there is no indication that the use of CW Omega Plastic will result in any employee exposure to excess levels of formaldehyde because the product contains only 0.1 percent formaldehyde. Under the standard, an employer is exempted from conducting exposure monitoring only if it has reasonable objective information that no excess exposure to formaldehyde can occur. *See* 29 C.F.R. § 1910.1048(d)(1)(ii).[11] G & C has not presented such information here. Moreover, although CW Omega Plastic contains less than 0.1 percent of formaldehyde, Hoffman testified that one cannot determine whether the permissible limit will be exceeded based merely on the amount of formaldehyde in a product.[12]

Accordingly, based on the lack of representative sampling of formaldehyde levels from the core room and the cupola furnace area, we affirm the citation alleging a violation of section 1910.1048(d)(1)(iv).

III. Conclusion

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[11]*Exception*. Where the employer documents, using objective data, that the presence of formaldehyde or formaldehyde-releasing products in the workplace cannot result in airborne concentrations of formaldehyde that would cause any employee to be exposed at or above the action level or the STEL under foreseeable conditions of use, the employer will not be required to measure employee exposure to formaldehyde.

[12]We agree with the Secretary that even if G & C could have relied initially on the percentage of formaldehyde in CW Omega Plastic to conclude that testing was not necessary, complaints of headaches, dizziness, and the numbing of the fingertips made by Mr. Ronald Huskey, the cupola repairman, after working with the product for a couple of weeks would have rendered continued reliance unjustified.

For the reasons stated above, we affirm citation Item 1b, alleging a serious violation of 29 C.F.R. § 1910.1000(e), and Item 2, alleging a serious violation of 29 C.F.R. § 1910.1048(d)(1)(iv). As neither party has objected to the penalties assessed by Judge Brady, we affirm a group penalty of $1,625 for Items 1a (not on review) and 1b, and a penalty of $1,300 for Item 2.

/s/
Stuart E. Weisberg
Chairman

/s/
Daniel Guttman
Commissioner

Dated: July 31, 1997