

## U.S. Department of Labor

Occupational Safety and Health Administration  
Washington, D.C. 20210

Reply to the Attention of:

December 9, 1994

MEMO TO: DR. ROBERT MASON  
NATIONAL INSTITUTE FOR OCCUPATIONAL  
SAFETY AND HEALTH

FROM: CAROLINE FREEMAN *C. Fu*  
OSHA-HEALTH STANDARDS PROGRAMS

SUBJECT: DRAFT WORKER'S HOME CONTAMINATION REPORT

Thank you for the opportunity to review and comment on this important document. While I have reviewed the entire document, I am focusing my comments primarily on those sections that deal with mercury, cadmium, and OSHA. I hope you find these comments useful. Please contact me if you have any questions or you need further assistance at (202) 219-7111.

Pages 28-29 In general, when speaking about mercury (Hg) in this document, specify up front that you will be dealing with elemental Hg only and not with organic mercury compounds. The highly toxic form of mercury, methylmercury (MeHg), is not the subject of this document, although MeHg is rapidly formed from elemental Hg in the general environment and is, therefore, of some concern around workplaces.

Also, in general, specify that elemental Hg is very difficult to analyze, requiring considerable skill on the part of the technician, especially at low levels commonly found in biologic media and in the environment. Furthermore, regarding the finding of biologic indices that are not elevated above background (or reference population levels), as referred to below in this document: (a) the lifetime of Hg vapor (or elemental Hg) in the body is very limited because Hg is rapidly oxidized; (b) Hg vapor from the blood crosses into the brain and crosses placenta; (c) in the brain, Hg has a long retention time and is difficult to sample in this critical organ; (d) chronic exposures result in CNS and peripheral nerve effects; (e) recent exposures are dominant factor affecting HgU and HgB levels; and, (f) there is no generally accepted biologic index for Hg in critical organs. Given the above, it is not surprising that in some

of the following studies, no elevated biologic parameters were identified. This, however, does not mean that Hg-related health effects have not occurred among families of Hg-exposed workers.

- Page 31      End of first carry-over paragraph, again place "caveat" that given the chemical characteristics of Hg, elevated biologic indices may not be observed.
- Page 32      At end, is there need to state that Hg clean-up is made extremely difficult because elemental Hg, when "wiped-up," will just spread into ever thinner layers, increasing surface area covered?
- Page 37      (j) Cadmium - Again, in general, it may be useful to discuss some of the chemical characteristics of cadmium that are relevant to this document: (a) in the body, cadmium has a very long half-life, even longer than lead, i.e., the half-life of cadmium in the liver, kidney and muscles is 5 to 15 years, 10 to 30 years, and more than 30 years, respectively; (b) fortunately, however, cadmium does not convert into organic compounds in the environment, like lead; (c) given cadmium's very long half-life, populations exposed to very low levels of cadmium will accumulate cadmium in the body and may be susceptible to cadmium-associated illnesses and sequelae; and (d) the biologic indices set forth in the cadmium final standards may not be protective of older-aged women and children. This last fact is stated in the preamble. (See Attachment A.) A paper that shows elevated levels among children around cadmium smelters deals with this fact. (See Ex. 8-38; OSHA Docket H-057a; Lauwerys, R., H. Roels, et al. Renal Response to Cadmium in a Population Living in a Nonferrous Smelter Area in Belgium. Int Arch Occup Environ Health 45:271-274, 1980.)

- Page 67      Insert after last sentence, "For example, in the preamble to the final cadmium standards, part of the justification for specific provisions (e.g., for showers, protective clothing, laundering, and dates for start-up of standard) deal with issues relating to family protection from 'take-home' toxins." (See Attachment A.)

The same provisions across standards would have the same justifications. (See Table-Substances Covered by NIOSH; this table is a rough approximation of what the standards require and is not fully comprehensive.)

I wouldn't address the following issue in this document necessarily, but perhaps it is useful for you to know that in settlement agreements, OSHA did include provisions for demonstrating equivalent protection of air showers. (See Attachment B.)

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Add to first paragraph? In the asbestos standard for the construction industries, OSHA does include a provision for using HEPA vacuuming of all workclothes before leaving the worksite; this was based on findings of cases of mesothelioma among family members; in construction industries, even with no exposures above the PEL, when have no provision for workclothes, HEPA vacuuming of workclothes is required so that workers do not carry fibers home; if above PEL, protective work clothing required in both gen. ind. and construction ind. stds, with provisions for proper laundering and handling.

Page 160

Typo - Brockhous, 4th line, results should be CdU not CU

Can you clarify (convert) the units in the Carvalho study?

Need to add paper by Lauwerys and Roels? (Ex. 8-38; OSHA Docket H-057a; referenced above) This paper doesn't deal with take-home toxins per se, however.

cc: Melissa McDiarmid, OSHA Occup. Med.

## SUBSTANCES COVERED BY NIOSH FOR WHICH OSHA HAS FULL STANDARDS

Asbestos (gen. ind. and const.)	Lead (gen. ind. and const.) <sup>1</sup>	Arsenic (gen. ind. only)	Cadmium (gen. ind. and const.) <sup>5</sup>
vision	provide above the PEL or where skin or eye irritation possible; replace daily if over specified levels (200 ug/m <sup>3</sup> ); remove in change rooms/areas; train those who launder; prohibit shaking	provide in reg. areas and where skin or eye irritation a problem; clean/replace; train those who launder	provide if exposed above the PEL or skin/eye irritation a problem; remove and store; clean and replace; train those who launder
Asbestos (gen. ind. and const.)	provide above the PEL and/or EL; launder; clean and replace; how to handle contaminated clothing <sup>1</sup>	change rooms, showers, lunchrooms, lavatories, vacuum clothes, avoid skin irritation	change rooms/areas; showers/handwash; lunchrooms/areas;
Asbestos (gen. ind. and const.)	showers, lunchrooms, and prohibit smoking - construct. and gen. ind. <sup>2</sup>	maintain surfaces as free as possible; vacuuming; plans; maintenance of equip.	clean-up; vacuum; waste disposal;
Asbestos (gen. ind. and const.)	provisions for general clean-up, vacuuming, waste disposal	signs, training, labels, labels, training,	signs, labels, training, MSDSs,
Asbestos (gen. ind. and const.)	signs, training, labels, train above the AL or where skin or eye irritation exists, address adverse health effects spec. adverse repro. effects		

These provisions are in both gen. ind. and construction; in construction industries, even with no exposures above the PEL, when there is no provision for workclothes, HEPA vacuum of workclothes required so that workers not carry fibers home; if above PEL, protective work clothing required in both gen. ind. and construction ind.

Additional provisions in construction industry std. for equipment and decontamination areas

Medical Surveillance - med. exam./consult. as soon as possible upon notification if employee wants advice on reproductive effects; past reproductive problems on med. Hx.

Presumptive exposures in construction industry std. - until employer shows that workers are  $\leq$  PEL, employer must provide personal protective equip., resp., biol.mon., change areas, and handwashing facilities.

See attachment A

## ATTACHMENT A

## From the Preamble to the Cadmium Standards

## 1. Health Effects - Chapter Five

(Lauwerys et al., 1974; Ex. 4-50)

"...Dr. Lauwerys stated that it should be stressed that th[e] biological threshold is proposed only for adult males occupationally exposed to cadmium and does not necessarily apply to other groups of the general population, e.g., women after menopause and children, whose sensitivity to cadmium could be different."

## 2. Summary and Explanation of Regulatory Text - Chapter Nine

"Showering also reduces the worker's period of exposure to cadmium by removing cadmium which may accumulate on the skin and hair. Requiring employees to change out of work clothes, which are then segregated from their street clothes, to shower before leaving the plant, and to leave work clothing at the workplace significantly reduces the movement of cadmium from the workplace. These steps assure that the duration of cadmium exposure does not extend beyond the workshift and provide added protection to employees and their families."

"The standard provides for access to exposure and medical records that basically is in accordance with 29 CFR 1910.20, OSHA's standard for "Access to Employee Exposure and Medical Records" under paragraph (n)(5)(i). That standard applies to records required by specific standards, such as this cadmium standard. In addition, it is OSHA'S intention that the employee should have similar access to exposure and medical records that are voluntarily created by an employer. Employees, their designated representatives, and former employees are, in general, allowed unrestricted access to all relevant exposure monitoring records. More limited access is provided for medical records. Access to all the employee's medical records required to be kept under paragraph (n)(3) of this standard is provided to the subject employee, to anyone having the subject employee's specific written consent, and, after the employee's death or incapacitation, to the employee's family members. In addition, OSHA and NIOSH retain access to both kinds of records, but the agencies' access to personally identifiable medical records is subject to agency rules of practice and procedure that have been published at 29 CFR 1913.10 (see 45 FR 35384) and to the limitations to protect confidentiality incorporated in 29 CFR 1910.20."

"Protective clothing and foot coverings are required to prevent contamination of the employee's body and the employee's street clothing and shoes. Protective clothing, if provided and

used properly, helps to prevent cadmium exposure beyond the workplace. By contrast, wearing contaminated street clothing outside the worksite would lengthen the duration of the employee's exposure and could cause cadmium to accumulate in employees' cars and homes, exposing other individuals to the hazard."

"The standard also requires that the employer be responsible for cleaning, laundering and disposing of the required protective clothing and equipment, to eliminate any potential exposure that might result if the clothing and equipment were laundered or cleaned by the employee at home. Like the proposal (55 FR 4124), the final standard requires that protective clothing and equipment be cleaned, maintained, and replaced as needed in order to assure its effectiveness."

"Some minor modifications have been made to the proposal. For example, the effective date is 90 days after publication, rather than the proposed 60 days. OSHA decided to give employers slightly more time to comply with the standard. In addition, if employers do not now provide adequate handwashing facilities, they are required to provide adequate temporary or permanent facilities within 60 days after the effective date (120 days for small businesses). The proposal did not include any requirement for prompt provision of handwashing facilities. This omission was pointed out by a commenter, who correctly noted that portable sinks and other hygiene facilities can be readily provided (Ex. 19-7). OSHA agrees. It is important that workers be able to wash off any cadmium from their hands and faces before they eat, smoke and leave work. This will reduce their overall exposure to cadmium and limit the carrying of cadmium dust into their cars and homes. OSHA believes that most employers already provide handwashing facilities and that the cost of providing such facilities, where they are not already provided, is relatively modest."

## ATTACHMENT B

**Text From SAFT Settlement Agreement (Ex. Ex. L-180; Cadmium Docket H-057a)**

**6. SHOWER FACILITY**

In order to satisfy the provisions of 29 C.F.R. §§ 1910.1027(j)(1) and (j)(3) requiring wet showers, SAFT shall require all employees exposed above the PEL to pass through the air tunnel described in the previous section at the end of their work shift. If engineering and work practice controls have not succeeded in reducing all employee exposures to or below the PEL by December 31, 1995, then SAFT shall comply with paragraphs (j)(1) and (j)(3) by April 30, 1996. If, however, in accordance with section 6(d) of the OSH Act, SAFT is able to present sufficient objective evidence that its air shower is as effective as a wet shower in removing cadmium from employees' hair and skin, OSHA will grant a permanent variance from the wet shower requirement.