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March 12, 1985

Summary of OSHA's Benzene Standard Proposal Dated February 15, 1985 and Formally Transmitted to OMB on March 7, 1985

I. Scope and Application

A. The standard would apply to all occupational exposures to benzene, with six designated exclusions. The exclusion which would appear to have the greatest potential application within the petrochemical industry is for the storage, transportation, distribution or sale of benzene or liquid mixtures containing more than 0.1% benzene in intact containers or in transportation pipelines sealed in such a manner as to contain benzene vapors or liquid. Even where this exclusion applies, OSHA's Hazard Communication Standard must be followed, as well as the emergency provisions of the Benzene Standard.

B. "Benzene" is defined so as not to include unreacted benzene contained in solid materials.

II. Permissible Exposure Limit (PEL)

A. 8-hour TWA of 1 ppm with an action level of 0.5 ppm. (OSHA specifically requests comment on whether the PEL should be averaged over 40 hours rather than 8.)

B. STEL -- 5 ppm averaged over a 15 minute period.

III. Methods of Compliance -- Employee exposures are to be maintained at or below the PEL (both the TWA and the STEL) through the use of engineering controls and work practices -- except that respiratory protection may be used as an alternative control measure in the following circumstances:

A. During the time period necessary to install or implement feasible engineering and work practice controls.

B. Where the employer can establish that engineering and work practice controls are not feasible.[1/] Section 1910.1028(g)(ii) identifies "maintenance and repair activities, vessel cleaning, or operations where . . . exposures are intermittent in nature and limited in duration"[2/] as operations in which the employer may establish that engineering and work practice controls are not feasible. Both the text of the standard and the discussion of this issue in the Preamble are ambiguous. They do not make clear (i) whether these identified operations are automatically deemed exempt from the requirement of using engineering and work practice controls, or (ii) whether these operations are presumptively deemed to be ones in which engineering and work practice controls are infeasible, or (iii) whether the employer still retains the full burden of establishing that engineering and work practice controls are not feasible in these operations. Which of these outcomes is intended can be very important.

C. Where benzene is present in a workplace less than 30 days per year. (Note that the test here is whether benzene is present in the workplace less than 30 days per year, not whether employees are exposed to benzene less than 30 days per year.)

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1/ Where engineering and work practice controls are feasible but are not sufficient to reduce employee exposure to or below the PEL, they must be used to reduce exposure to the extent achievable and must be supplemented by the use of respiratory protection.

2/ The Preamble identifies gauge checking as an example of an operation that is brief or intermittent. See Preamble at 242.

D. During emergencies. "Emergency" is defined as any occurrence such as equipment failure, rupture of containers, or failure of control equipment, which may or does result in an unexpected significant release of benzene.

IV. Exposure Monitoring

A. Initial monitoring is to be completed within 60 days of the effective date of the standard. Monitoring performed within one year prior to publication of the standard can satisfy the initial monitoring requirement.

B. Periodic Monitoring

1. Every six months if employee exposures are above the PEL.

2. Annually if employee exposures are between the PEL and the action level.

C. Termination of Monitoring -- Monitoring may be discontinued if:

1. Initial monitoring reveals employee exposures to be below the action level; or

2. Periodic monitoring, involving at least two consecutive measurements taken at least 7 days apart, reveals employee exposures to be below the action level.

D. Additional monitoring is required:

1. When there has been a change in the production process, chemicals present, control equipment, personnel or work practices which may result in new or additional exposures to benzene, or when the employer has any reason to suspect a change which may result in new or additional exposures. (Use of the terms "may result" and "any reason to suspect" seems unduly broad. At one point in the Preamble, OSHA uses the phrase "likely to lead to higher exposure," which would seem to be a more appropriate formulation. See Preamble at 221.)

2. Whenever spills, leaks, ruptures or other breakdowns occur. (Use of the term "leaks" would appear to be unduly broad, since there may be a large number of very small leaks from valves, pumps, and other equipment which do not warrant additional monitoring.)

E. Notification of monitoring -- Employees are to be notified of monitoring results in writing, either individually or by posting, within 15 working days after the employer receives the monitoring results.

V. Regulated Areas and Compliance Programs

A. The employer must establish "regulated areas" where airborne concentrations of benzene exceed the PEL, and must demarcate the area and limit access to authorized persons. The area must bear a "Danger" sign indicating the presence of benzene, must identify benzene as a cancer hazard, and must state that respirators are required. (The result would appear to be that where airborne concentrations exceed 1 ppm, a regulated area would have to be established and respirators would have to be worn, even though employees spend so little time in that area that their 8-hour TWA would not exceed 1 ppm without the use of respirators. It is not clear whether this is intended, but apparently it is. See Preamble at 277.)

B. Where the PEL is exceeded, employers must establish and implement a written compliance program to reduce employee exposure to or below the PEL primarily by means of engineering and work practice controls. The plans are to be reviewed annually and revised as appopriate.

VI. Respiratory Protection

A. Respirators must be used where necessary to prevent employee exposures from exceeding the PEL. They may lawfully be used in the situations described in III.A.-III.D. above.

B. The employer is given the option of providing either quantitative or qualitative fit tests for each employee wearing a negative pressure respirator. However, the Preamble expresses a preference for quantitative fit testing (see Preamble at 245-246) and requests comment on the issue.

VII. Medical Surveillance

A. Covered employees -- Medical surveillance is to be made available to employees:

1. Who are or may be exposed to benzene at or above the action level 30 or more days per year;

2. Who are or may be exposed to benzene at or above the PEL ten or more days per year;

3. Who have been exposed to more than 10 ppm of benzene for 30 or more days in a year prior to the effective date of the standard when employed by their current employer;[3/] and

4. Who have been exposed to an emergency situation (presumably after the effective date of the standard, but this is not clear).

B. Initial examinations are to be provided within 60 days of the effective date of the standard or before the time of initial assignment, unless the employee has been given an equivalent medical examination within six months prior to the effective date of the standard. The initial examination must include:

1. A detailed occupational history;

2. A family history of blood dyscrasias;

3. A detailed medical history;

4. A complete physical examination;

5. Lab tests -- including a complete blood count with erythrocyte count, a leukocyte count with differential, quantitative thrombocyte count, hematocrit, hemoglobin and erythrocyte indices (MCV, MCH, MCHC);

6. Additional tests as necessary, in the opinion of the examining physician, based on alterations to the components of the blood which may be related to benzene exposure; and

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3/ OSHA requests comment on whether medical examinations are needed for employees who had significant benzene exposure with prior employers. See Preamble at 253.

7. For workers required to wear respirators for at least 30 days per year, a pulmonary function test and chest X-ray.

C. Periodic examinations must be provided at least semi-annually, and must include the following:

1. A brief history regarding new exposure to potential marrow toxins, changes in drug and alcohol intake and the appearance of physical signs relating to blood disorders;

2. Lab tests as described in VII.B.5. and 6 above.

3. An additional medical examination, including those elements considered appropriate by the examining physician, where the employee develops signs and symptoms commonly associated with toxic exposure to benzene; and

4. For persons required to use respirators for at least 30 days a year, a pulmonary function test every three years and a chest X-ray every five years.

D. Emergency Examinations -- If an employee is exposed to benzene in an emergency, a urine sample must be taken at the end of the employee's shift and a urinary phenol test must be performed within 72 hours. The urine specific gravity must be corrected to 1.024. If the result of the urinary phenol test is equal to or greater than 75 mg phenol/L of urine, the employee must be given a complete blood count at three months following the emergency exposure.

E. Additional Examinations and Referrals

1. Where the results of the complete blood count indicate the following abnormal conditions, the blood count must be repeated within two weeks. If the abnormality persists, the examining physician must refer the employee to a hematologist or internist for further evaluation unless the physician has good reason to believe that such referral is unnecessary. The conditions identified as abnormal are as follows:

a. The hemoglobin is below 14 grams percent for males or 12 grams percent for females

and the hematocrit is less than 38 for males or 35 for females, and/or these indices show a persistent downward trend from the individual's pre-exposure norms, and these findings cannot be explained for other medical reasons;

b. The thrombocyte (platelet) count varies more than 15 percent below the employee's most recent values or falls below $140 \times 10^3$ platelets per $mm^3$.

c. The leukocyte count is below 4,000 per $mm^3$ or there is an abnormal differential count.

2. Medical Removal -- When an employee is referred to a hematologist or internist under the standard, he must be temporarily removed from further exposure to benzene in the workplace. Following the hematologist/internist's evaluation, a decision whether to allow the employee to return to the area of benzene exposure is to be made by the physician after consultation with the hematologist/internist. Although the employee is to be notified of the duration of the removal and the requirements for future medical examinations to review the removal d cision, the standard makes no provision for moving the employee to another position or retaining his wage-rate.

3. The hematologist or internist must make a determination as to the need for additional tests, which the employer shall assure are provided.

VIII. Hazard Communication

A. Regulated areas must be demarcated with a warning sign, which may be temporary in the case of maintenance or repair work.

B. Labels or other appropriate forms of warning (complying with the requirements of OSHA's Hazard Communication Standard) must be provided for containers of benzene within the workplace. (The Preamble -- at page 278 -- refers to a provision of the standard requiring labels on containers leaving the workplace as well. But that provision does not appear in the text of the standard.)

C. Material safety data sheets must be made available to employees.

D. Manufacturers or importers also must comply with the requirements of OSHA's Hazard Communication Standard.

E. Annual information and training must be provided in accordance with the Hazard Communication Standard. This appears to apply even when exposures do not exceed the action level.

IX. Recordkeeping

A. Exposure records must be maintained for at least 30 years and must be made available for examination and copying by employees, employee representatives, and OSHA.

B. Medical surveillance records must be maintained for at least the duration of employment plus 30 years and must be made available for examination and copying upon request of the subject employee or to anyone having the subject employee's specific written consent, and to OSHA.

X. Effective Date

A. Most requirements of the standard would become effective 60 days after the effective date of the standard. The effective date of the standard would be 90 days after publication in the Federal Register.

B. Implementation of necessary engineering and work practice controls required under the standard would have to be completed within two years after the effective date of the standard.

DOW CHEMICAL U.S.A.

LOUISIANA DIVISION
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PLAQUEMINE, LOUISIANA 70764-0150
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Dear

Your urine phenols which were run on _____ showed _____mg of phenol in the morning and _____mg of phenol in the afternoon. ~~Anything below 75 mg is considered normal however~~ there is normally some phenol in the body from foods and their metabolic products. A level of 75 mg corresponds to an air level of 10 ppm of benzene which is the OSHA standard. It is the difference between morning and afternoon levels which determines your workplace exposure. If the difference is significant you will be asked to come in and discuss the results.

Sincerely,

Kirby J. Flanagan, M.D.
Medical Department

lmw

4-27-83
PER DR. CURRIER —
BENZENE SURVEY REPORT :
ADD DIFFERENCE (LAST COLUMN) AS "DELTA PHENOL" + OR —



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