

the time of day the operation is normally conducted. If the benzene level is above half the action level for the operation, additional monitoring must be conducted under those weather conditions that will maximize benzene exposure, such as low wind, stable air, and high temperature.

(6) The monitoring method used must be accurate to a confidence level of 95 percent to within plus or minus 25 percent for airborne concentrations of benzene equal to or greater than 0.5 ppm.

(b) *Initial exposure monitoring.* When benzene is first loaded as a cargo on board a vessel, an initial monitoring of each type of operation must be conducted to determine accurately the representative personal exposure of persons involved in the operation.

(c) *Periodic exposure monitoring.* The monitoring must be repeated each July or August if benzene containing cargoes are carried during those months; monitoring must be conducted under those weather conditions that will maximize benzene exposure, such as low wind, stable air, and high temperature. If benzene containing cargoes are not carried during those months, monitoring must be conducted at the time of carriage nearest those months; monitoring must be conducted under those weather conditions that will maximize benzene exposure, such as low wind, stable air, and high temperature.

(d) *Additional exposure monitoring.* (1) Monitoring in compliance with paragraphs (b) and (c) of this section must be repeated for the operation when there has been a change in the procedure, equipment, or work practices of the operation which may increase personal exposure or whenever the employer or person in charge has any reason to suspect that personal exposure has increased.

(2) Whenever emergencies occur that may increase personal exposure, operations affected by the emergency must be monitored using area or personal sampling after the spill is cleaned up or the leak, rupture, or other breakdown is repaired to determine when personal exposure has returned to the level that existed before the emergency. There must be monitoring equipment aboard each ship.

(3) For those cases in which the benzene exposure can vary significantly over the year, the personnel exposure reduction plan can reflect this variation in time if both initial and periodic exposure monitoring are conducted at those times. There must be sufficient monitoring to quantitatively justify differences in the exposure reduction program over the course of the year. The exposure monitoring must be conducted under those weather conditions that will maximize benzene exposure, such as low wind, stable air, and high temperature.

(4) The Coast Guard may require additional monitoring upon reasonable belief that the PEL's are being exceeded.

(e) *Notification of exposure monitoring results.* (1) Within 60 working days after the receipt of the results of monitoring in compliance with this section, each person involved in the operation monitored must be given written notice of the results, either by separate letter or by notice posted in a location accessible to all persons involved.

(2) If the results indicate that the PELs were exceeded, the written notice required by paragraph (e)(1) of this section must state, or refer to a document available to the persons involved which states, the corrective action to be taken to reduce the personal exposure to or below the PELs.

[CGD 88-040, 56 FR 52135, Oct. 17, 1991; 56 FR 65006, Dec. 13, 1991; CGD 95-028, 62 FR 51221, Sept. 30, 1997]

§ 197.545 Program to reduce personal exposure.

(a) When personal exposure for an operation is over the applicable PEL as determined in compliance with § 197.540, the employer shall develop and implement, within 60 working days of the date of that determination, a written program detailing the corrective actions that will be taken to reduce personal exposure to or below the PEL's. The written program must include a timeframe for implementing the corrective actions to be taken.

(b) Corrective actions in compliance with paragraph (a) of this section may include, but are not limited to, one or more of the following:

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(1) Engineering controls (e.g. vapor control or recovery systems, closed loading systems, or controlled venting systems);

(2) Revised work practices; or

(3) Respirators in compliance with § 197.550 and personal protective clothing and equipment in compliance with § 197.555.

(c) Whenever the exposure monitoring data show a significant increase in personnel exposure, the program must be revised to reflect the new data.

(d) Each person involved in the operation must be notified that a written program detailing corrective actions is available upon request.

(e) A copy of the written program must be furnished upon request to the Coast Guard.

§ 197.550 Respiratory protection.

(a) *General.* When the use of respirators in compliance with this section and the personal protective clothing and equipment in compliance with § 197.555 is chosen as the method or one of the methods in compliance with § 197.545 to be used in meeting the performance standard, the respirators used must be selected and fitted according to this section.

(b) *Respirator selection.* (1) The respirator must be approved by the Mine Safety and Health Administration (MSHA) in compliance with 30 CFR part 11. When filter elements are used, they must include MSHA approval for organic vapors or benzene.

(2) The employer shall provide affected employees with the appropriate respirators without charge and ensure that the respirators are used properly. Any employee determined by the testing physician as being unable to wear negative pressure respirators, who continues to be subject to exposure over the PEL, must be given the option of wearing a respirator with less breathing resistance, such as a powered air-purifying respirator or a supplied air respirator.

(3) Electrically powered respiratory protective equipment must meet the electrical engineering requirements in subchapter J of this chapter and the electrical equipment requirements in part 151, table 151.05, and part 153, table 1, of this chapter.

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(4) The type of respirator provided must be a type specified in table 197.550(b) of this section that is appropriate for the exposure.

TABLE 197.550(b)—RESPIRATORY PROTECTION FOR BENZENE

Airborne concentration of benzene or condition of use	Respirator type
Up to 10 times the TWA	(1) Half-mask air-purifying respirator with organic vapor cartridges.
Up to 50 times the TWA	(1) Full facepiece respirator with organic vapor cartridges. (2) Full facepiece gas mask with chin style canister. ¹
Up to 100 times the TWA	(1) Full facepiece powered air purifying respirator with organic vapor canister. ¹
Up to 1,000 times the TWA ...	(1) Supplied air respirator with full facepiece in positive-pressure mode.
More than 1,000 times the TWA or unknown concentration.	(1) Self-contained breathing apparatus with full facepiece in positive pressure mode. (2) Full facepiece positive-pressure supplied-air respirator with auxiliary self-contained air supply.
Escape	(1) Any organic vapor gas mask. (2) Any self-contained breathing apparatus with full facepiece
Fire fighting	(1) Full facepiece self-contained breathing apparatus in positive pressure mode.

¹ Canisters for non-powered air purifying respirators must have a minimum service life of four hours when tested at 150 ppm benzene, at a flow rate of 64 liters/minute at 25 °C and 85% relative humidity. Canisters for powered air-purifying respirators must have a flow rate of 115 liters/minute (for tight fitting respirators) or 170 liters/minute (for loose fitting respirators).

(c) *Respirator fit testing.* (1) Before the person is permitted to use a respirator selected and fitted in compliance with this section, the person must undergo an Initial Fit Test (IFT) and either a Qualitative Fit Test (QLFT) or a Quantitative Fit Test (QNFT), in compliance with Appendix E of this subpart, using the respirator fitted. If a negative pressure respirator is used, the QLFT or QNFT must be repeated at least once a year thereafter.

(2) The objective of the tests is to identify for the person a respirator which minimizes the chance of leakage.

(3) The person conducting the tests required by paragraph (c)(1) of this section must understand the purpose of these tests and how to perform them.