1 Status

1.1 New policy, effective 09/02/11.

2 Purpose

2.1 This document provides guidelines for achieving compliance with OSHA Benzene Standard (29 CFR 1910.1028). It is intended to supplement, not replace, a thorough understanding of the standard.

3 Applicability

3.1 This policy applies to all subsidiary companies and departments of The Cianbro Companies.

3.2 All organizations are required to comply with the provisions of this policy and procedure. Any deviation, unless spelled out specifically in the policy, requires the permission of the Corporate Safety Officer or designee.

4 Definitions

4.1

5 Policy

5.1 This policy applies to all Team Members at job sites where they could be exposed to mixtures containing greater than 0.1% benzene, unless specifically exempted by the standard.

6 Responsibilities

6.1 The Manager of the job site is responsible for the implementation of this policy on the job site.

6.2 Corporate Safety is responsible for maintaining this document.
7 Workplace Protection Program for Benzene

7.1 Plans
At each site where there is exposure to Benzene, an activity plan must be developed to address how to safely perform the work. The activity plan must be revised and reviewed based on changes in tasks, monitoring results, changes in exposure, etc. The activity plan shall be reviewed by all team members who may be exposed. In addition, this policy and procedure shall be made available to team members onsite.

7.2 Permissible Exposure Limits
Team Members shall not be exposed to an airborne concentration of benzene greater than 1 ppm as an 8-hour time-weighted average (TWA), or 5 ppm as averaged over any 15-minute period (short term exposure limit, or STEL).

7.3 Regulated Areas
Regulated areas will usually be established by the client. Any exceptions to this should be specifically agreed to with the client. If the Company is responsible for establishing a regulated area, signs shall be posted at all access points and be clearly demarcated with barricade tape or equivalent (as a minimum). The boundaries should be established with a direct-reading instrument whenever possible. Access must be limited to authorized personnel. At a minimum, authorized personnel will have received benzene hazard training and fit testing on any protective equipment they are required to wear.

7.4 Exposure Monitoring

7.4.1 Team Member exposure monitoring must be conducted at least once for each job classification in each work area that contains benzene. If the client does not conduct monitoring for Team Members, then the Company must do it.
- The number of samples required for a representative baseline depends on several factors, including:
  - Whether a “worst case” exposure can be monitored
  - The frequency of exposure-related tasks
  - The number of Team Members exposed
  - The nature of the work

7.4.2 The sampling must take into account the task being performed. Samples should be taken on days when Team Members are performing tasks with potential exposure to benzene, and a description of the tasks should be recorded on the sample sheet. Team Members should aim toward at least one sample per task, rather than per-job classification.
- If a full-shift sample exceeds 0.16 ppm and the exposure is believed to be related to a short-term task performed during the shift, then STEL sampling should also be conducted. For assistance with sampling or interpreting the results, contact the HSE Manager.
• The frequency of periodic sampling shall be determined by specifications outlined in the standard.
• Team Members must be notified of the results of their monitoring within 15 working days of the receipt of the results, using the Sample results form. Other Team Members who perform similar tasks should also be made aware of these results. Bulletin board posting or equivalent methods will be adequate.

7.5 Compliance Programs
All feasible engineering and administrative controls must be used to reduce the exposure to Benzene. These controls must be identified in the activity plan. They must be used even if they do not by themselves reduce the exposure to at or below the PEL. These controls must be in place prior to the work being done. At client facilities, we must understand what engineering and administrative controls the client has put in place to reduce the exposure.

7.6 Respiratory Protection
A site written respiratory protection plan must be in place and address selection of appropriate respirators based on the airborne levels of Benzene. Fit testing will be conducted initially and annually in accordance with one of the approved protocols in the procedure.

7.7 Protective Clothing
Generally, the Company will use the protective clothing specified by the client. Most impervious materials are adequate for incidental contact. However, tasks requiring total immersion or extended contact with the liquid may require more selectivity. Viton and polyvinyl alcohol (PVA) are the best materials for gloves, but both have specific drawbacks. Questions regarding selection of gloves and protective suits should be addressed to the safety specialist on site. In all cases, both eye protection and dermal (skin) protection must be provided if there is potential exposure.

7.8 Medical Surveillance
• Monitoring will identify tasks with potential exposure greater than 0.5 ppm of airborne benzene as an 8-hour TWA. If any Team Member performs these tasks for at least 30 days per year (equivalent to one-half day per month), then he or she is required to be enrolled in a medical surveillance program. Exposure to greater than the PEL (1 ppm 8-hour TWA or 5 ppm STEL) for more than 10 days per year also requires medical surveillance.
• The initial exam must be conducted prior to assignment to a job, which involves the exposure level and frequency described above. The exam must include an occupational history, which should be done on the form in the “Benzene — Related Medical History” section and presented to the physician for review.
• The exam also includes blood tests. There will be a delay between the time the blood is drawn and the time the results are received. If the Team Member must be brought onto the job site before the results are received, do not allow him or her to work with benzene until medical clearance is obtained.
• Pulmonary function testing is required by the standard if respirators will be worn for at least 30 days per year. For the Company’s purposes, pulmonary function shall be done on all initial benzene physicals.
• Emergency exams, including a urinary phenol test, are required if Team Members are exposed to benzene in an emergency situation. The standard defines emergency as “any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which may or does result in an unexpected, significant release of benzene.” Additional insight can be gained from the urinary phenol limit of 75-mg/liter set by OSHA. This represents an exposure level of approximately 10 ppm as an 8-hour time-weighted average or 4800 ppm/min (480 min x 10 ppm). (The average is American Conference of Government Industrial Hygienists (ACGIH) Documentation of Threshold Limit Values, 1986, BE 1-4, Table 1.) This standard can be used as a guideline for determining if testing is needed. For example, if an unprotected Team Member was exposed to 50 ppm for one hour, this would represent 3000 ppm/min (50 ppm X 60 min) and would probably not be considered an emergency.
• In the event of an emergency exposure, urine samples may be collected on site at the end of the shift and sent to the clinic. There is no need to send the Team Member to the doctor unless he or she is exhibiting symptoms of overexposure. Arrangements should be made in advance for a laboratory or clinic to perform the analysis and method of transporting the samples. Sample guidelines are included in the “Guidelines for Evaluation of Emergency Exposure to Benzene” section. Because several over-the-counter drugs may increase urinary phenol levels, a “Questionnaire and Release Form” should be completed by the Team Member at the time the sample is given.
• The standard requires that certain information be provided to the physician. Contact OMC for help with this.

7.9 Communication of Hazards

7.9.1 Team members shall receive (in addition to basic hazard communication training) documented training prior to starting work on a project where they will be potentially exposed to Benzene. The training must be job specific and should address the following:
• Locations where benzene is used in a host facility and any client requirements relating to benzene.
• The provisions of site specific contingency/emergency plans.
• How to recognize tasks that might result in occupational exposure to benzene.
• How to limit exposure by using work practice and engineering controls.
• How to obtain information on the types, selection, proper use, location, removal, handling, decontamination and disposal of PPE; and
• Who to contact and what to do in an emergency.

7.9.2 Retraining should be conducted annually, regardless of exposure levels.

7.9.3 Subcontractors who may be exposed to benzene must be informed of the presence of benzene and the existence of the OSHA standards as part of the written contract. The subcontractor should provide Cianbro with a list of Team Members who have been trained and fit tested (if necessary) according to the standard. Cianbro should not conduct the actual training or fit testing for anyone other than its own Team Members unless approved by the Vice President of HR and Safety.

7.10 Record Keeping

7.10.1 Records of fit tests, medical surveillance, and sampling results must be kept for 30 years after the team member leaves Cianbro. Training records must be sent to the Cianbro Institute to be entered into the system.

7.10.2 If the client conducts the monitoring, the Company must receive copies of sample data sheets or summaries that contain at least the following information:
• Date
• Duration
• Results
• Descriptions of sampling and analytical method
• Description of type of respiratory protective devices used (if any)
• Name and social security number of Team Member
• Job classification of Team Member
• Description of type of work
7.11 Observation of Monitoring
   Team Members will normally observe monitoring as part of their routine jobs. When conducting monitoring, the person doing the sampling should explain the purpose of what he or she is doing and briefly describe the procedure to the Team Members involved.

8  Budget / Approval Process

8.1 The job site is responsible for cost associated with this policy including all PPE required except for prescription safety glasses and safety toe boots.

9  Related Documents

9.1 Appendix A Benzene Awareness
Benzene Awareness

1.0 Introduction

Cianbro team members have the right to know about possible hazards that may be present in their work area(s) and how to protect themselves from such hazards. Our Hazard Communication Program provides a general overview of how such hazards must be managed at the jobsite. Some hazards are more common to certain activities and/or work locations and planning for possible team member exposures should be a daily process. In order to help project locations with planning and training processes relating to specific hazardous materials, this hazardous material awareness sheet has been created to address possible team member exposure to benzene.

Benzene is an aromatic hydrocarbon that is produced by the burning of natural products. It is a clear, colorless liquid with a pleasant, sweet odor. The odor of benzene does not provide adequate warning of its hazard. It is a component of products derived from coal and petroleum and is found in gasoline and other fuels. With this in mind, the most likely possible exposure to benzene for Cianbro team members is during the fueling of vehicles and other equipment and also from breathing vehicle and equipment exhaust fumes. Benzene is used in the manufacture of plastics, detergents, pesticides, and other chemicals. It is estimated that about half of the total population burden of exposure to benzene is from the 50 million people who smoke cigarettes. A smoker is exposed to 10 times the levels of benzene compared to the exposure of a non-smoker. Research has shown benzene to be a carcinogen (cancer-causing).

2.0 Permissible Exposure

The maximum time-weighted average (TWA) exposure limit is 1 part of benzene vapor per million parts of air (1 ppm) for an 8-hour workday and the maximum short-term exposure limit (STEL) is 5 ppm for any 15-minute period.

3.0 Health Hazard Data

Benzene can affect your health if you inhale it, or if it comes in contact with your skin or eyes. Benzene is also harmful if you happen to swallow it. Effects of overexposure include:

Short-term (acute) overexposure - If you are overexposed to high concentrations of benzene, well above the levels where its odor is first recognizable, you may feel breathless, irritable, euphoric, or giddy; you may experience irritation in eyes, nose, and respiratory tract. You may develop a headache, feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.

Long-term (chronic) exposure - Repeated or prolonged exposure to benzene, even at relatively low concentrations, may result in various blood disorders, ranging from anemia to leukemia, an irreversible, fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms.

4.0 Precautions for Safe Use, Handling and Storage

Benzene liquid is highly flammable. It should be stored in tightly closed containers in a cool, well ventilated area. Benzene vapor may form explosive mixtures in air. All sources of ignition must be controlled. Use non-sparking tools when opening or closing benzene containers. Fire extinguishers, where provided, must be readily available. Know where they are located and how to operate them. Smoking is prohibited in areas where benzene is used or stored. It is also important to avoid gasoline and diesel fumes during fueling activities and to reduce team member exposure to exhaust fumes as much as possible.
5.0 Protective Clothing and Equipment

Respirators - Respirators are required for those operations in which engineering controls or work practice controls are not feasible to reduce exposure to the permissible level. If respirators are worn, they must have the National Institute for Occupational Safety and Health (NIOSH) seal of approval, and cartridge or canisters must be replaced before the end of their service life, or the end of the shift, whichever occurs first. If you experience difficulty breathing while wearing a respirator, you may request a positive pressure respirator. You must be thoroughly trained to use the assigned respirator, and the training will be provided by your employer.

Protective Clothing - You must wear appropriate protective clothing (such as boots, gloves, sleeves, aprons, etc.) over any parts of your body that could be exposed to liquid benzene.

Eye and Face Protection - You must wear a face shield and splash-proof safety goggles if it is possible that benzene may get into your eyes or if your face could be splashed with benzene liquid.

6.0 Emergency and First Aid Procedures

Eye and face exposure - If benzene is splashed in your eyes, wash it out immediately with large amounts of water. If irritation persists or vision appears to be affected see a doctor as soon as possible.

Skin exposure - If benzene is spilled on your clothing or skin, remove the contaminated clothing and wash the exposed skin with large amounts of water and soap immediately. Wash contaminated clothing before you wear.

Breathing - If you or any other person breathes in large amounts of benzene, get the exposed person to fresh air at once. Apply artificial respiration if breathing has stopped. Call for medical assistance or a doctor as soon as possible.

Swallowing - If benzene has been swallowed and the patient is conscious, do not induce vomiting. Call for medical assistance or a doctor immediately.

7.0 Training

Team members shall receive documented training prior to starting work on a project where Benzene is present. The training must be job specific and should address the following;

- Locations where benzene is used in a host facility and any client requirements relating to benzene.
- The provisions of site specific contingency/emergency plans.
- How to recognize tasks that might result in occupational exposure to benzene.
- How to limit exposure by using work practice and engineering controls.
- How to obtain information on the types, selection, proper use, location, removal, handling, decontamination and disposal of PPE; and
- Who to contact and what to do in an emergency.