



SAFETY BRIEF: FALL PROTECTION & BENZENE UPDATE

Our Safety Program was recently audited by ISNetWorld as part of a requirement by one of our clients, Citgo. The audit consisted of a review of our written health and safety programs, a phone interview of our safety management practices, and review of safety questionnaires filled out by some of employees.

Good news from the audit is that it was stated we have very solid safety program and management practices. We did have two minor deficiencies involving our employee questionnaire responses that need to be addressed. One question involved physical characteristics of benzene and the other involved general knowledge of our fall protection program. In response, this safety review will cover these issues. Please review this information and answer the quiz questions. We have to document our response and send our completed quizzes to ISNetWorld to complete our audit successfully.

Attachment 1 contains our Fall Prevention Safety Program. As this document covers issues that not all employees need to review, it is provided as general reference. The key points about of our employee fall protection program are bulleted below followed by a short quiz.

Attachment 2 is a Safety Brief on Benzene previously sent out. Review of this safety brief and completing the quiz will suffice as our response on this issue.

Fall Protection Program Key Points

General Fall Prevention

- All Hygieneering field staff shall receive training for the recognition of fall hazards and steps to take to minimize these hazards. Any staff exposed to fall hazards above 4 feet for OSHA General Industry and 6 feet for Construction Industry shall receive additional training appropriate for the particular project circumstances.
- Hygieneering follows OSHA rules for fall protection and therefore may vary by work environment. As most of our tasks are related to construction activities, the following fall prevention program focuses on the construction industry. Special accommodations will be made for any unusual work that would be covered under the OSHA General Industry Standard.
- Hygieneering staff need to be aware of their surroundings and job tasks at all times. If there is a situation where you are exposed to a fall hazard above 4 feet for General Industry tasks and 6' for Construction Industry tasks, you need to inform your Project Manager.
- The Project Manager is required to evaluate the work environment and tasks and ensure that a competent person (as defined by OSHA) provides a fall protection plan. The Project Manager is also responsible to ensure that fall protection is provided as necessary.
- Any staff exposed to fall hazards above the OSHA limits for General or Construction Industry shall receive additional training appropriate for the particular project circumstances.
 - Specifically, approved personal fall arrest, personal fall restraint or positioning systems shall be worn by those employees whose work exposes them to falling in excess of 4 feet from the perimeter of a structure, unprotected sides and edges, leading edges, through shaft-ways and openings, and certain sloped roof surfaces.



Ladder Safety

The following are some general safety guidelines for the inspection and use of ladders on the work site. Ladders must be inspected before use. No defective or unsafe ladders will be used.

- a) Ladder rungs, cleats, and steps should be level, uniformly spaced, and in good condition and have a slip-resistant coating or tread.
- b) Movable parts operate freely.
- c) Ladder is correct one for the needed purpose (tall enough for work, etc.).
- d) Use
 - Use extension ladders at a 4 to 1 angle (e.g. 12 foot ladder is 3 feet out at the base).
 - Face the ladder when ascending or descending.
 - Do not carry bulky items up a ladder. Have someone hand them up or hoist them instead.
 - Do not step on the top two stepladder steps, or the top four extension ladder rungs.
 - Do not reach too far out to one side or another when working off a ladder. Try to keep your belt-buckle inside the side-rails.
 - Secure the ladder to prevent displacement.

Personal Fall Arrest Systems

When needed, Hygieneering, Inc. does maintain and use Personal Fall Arrest Systems consisting of whole-body harnesses and lanyards when required by OSHA regulations, contractor's safety program, and site conditions. Important concerns when using conventional fall protection systems, such as harnesses and lanyards, include: fit and condition of the harness, condition and use of the lanyard, and stability of the anchorage point. Note: Specialty training will be required on a case by case basis for any Hygieneering staff member that needs to utilize a fall arrest system to perform their job function.

Aerial Work Platforms

During some sampling tasks, Hygieneering may rent self-propelled elevating work platforms (aerial lifts) to provide a safe work surface at heights. Specialized training is required before Hygieneering staff are allowed to operate such equipment.

The aerial lift will be inspected, used, and maintained in accordance with OSHA Subpart L Regulations, manufacturer's instructions, and ANSI/SIA A92.6 Standards. The aerial lift may not be field modified for any reason. The aerial lift must be inspected before each use. The aerial lift's maximum weight load must not be exceeded. Before using the aerial lift, make sure there is a clear path of travel and there are no obstructions. Be aware of and stay away from all live or potentially live electrical wiring or equipment.



Fall Prevention Safety Quiz

1. Any staff exposed to fall hazards above 4 feet shall receive additional training appropriate for the particular project circumstances, even if the task is covered by the OSHA Construction Industry Standard.
 True
 False

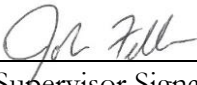
2. Ladders on a job site must be inspected at least weekly.
 True
 False

3. Specialty training will be required on a case-by-case basis for any Hygieneering staff member that needs to utilize a fall arrest system to perform their job function.
 True
 False

4. It is acceptable for Hygieneering field staff to use a client's aerial lift platform, with consent of the Project Manager and proper training conducted and documented.
 True
 False

SCORE: PASS / FAIL

Employee Signature



Supervisor Signature

Date



ATTACHMENT 1

FALL PREVENTION PROGRAM



7.11 FALL PREVENTION

Purpose/Scope

The purpose of this fall protection program is to establish guidelines for identifying, recognizing, and eliminating fall hazards on Hygieneering jobsites. This program also assists Hygieneering in making decisions for improving safety and reducing the risk of injuries due to falls. All Hygieneering field staff shall receive training for the recognition of fall hazards and steps to take to minimize these hazards. Any staff exposed to fall hazards above 4 feet for OSHA General Industry and 6 feet for Construction Industry shall receive additional training appropriate for the particular project circumstances.

Hygieneering follows OSHA rules for fall protection and therefore may vary by work environment. As most of our tasks are related to construction activities, the following fall prevention program focuses on the construction industry. Special accommodations will be made for any unusual work that would be covered under the OSHA General Industry Standard.

Specifically, approved personal fall arrest, personal fall restraint or positioning systems shall be worn by those employees whose work exposes them to falling in excess of 6 feet from the perimeter of a structure, unprotected sides and edges, leading edges, through shaft-ways and openings, sloped roof surfaces steeper than 7:12, or other sloped surfaces steeper than 40 degrees not otherwise adequately protected under other provisions in this manual.

The Project Manager is required to evaluate the work environment and tasks and ensure that a competent person (as defined by OSHA) provides a fall protection plan. The Project Manager is also responsible to ensure that fall protection is provided as necessary. In situations where fall protection is utilized, mechanisms shall be put in place to ensure the prompt rescue of a fallen worker.

Definitions

Competent Person: one who has specific training in, and is knowledgeable about fall protection, the use of protective systems, and the requirements set forth in 29 CFR 1926.500-503. In addition, the “competent person” must have the authority to take immediate action if a hazard exists.

Hole: a gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface.

Opening: a gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.

General Requirements

Ladder Safety

The following are some general safety guidelines for the inspection and use of ladders on the work site. Ladders must be inspected before use. No defective or unsafe ladders will be used.

- a) Inspection
- b) Ladder rungs, cleats, and steps should be level, uniformly spaced, and in good condition and have a slip-resistant coating or tread.
- c) Ladders should be surfaced so as to prevent injury from punctures, lacerations, and to prevent snagging of clothing.
- d) All ladders should be provided with slip-resistant feet to prevent slipping of the ladder during use.
- e) No improvised repairs have been made.
- f) Movable parts operate freely.
- g) Rungs are free of grease and oil.
- h) Ladder is correct one for the needed purpose (tall enough for work, etc.).



- i) Use
- Only one person on a ladder at a time.
 - Use ladder only for its intended purpose. Do not use them as a platform or walk-board.
 - Use extension ladders at a 4 to 1 angle (e.g. 12 foot ladder is 3 feet out at the base).
 - Face the ladder when ascending or descending.
 - Do not carry bulky items up a ladder. Have someone hand them up or hoist them instead.
 - Do not step on the top two stepladder steps, or the top four extension ladder rungs.
 - Do not use the bracing on the back of the stepladder for steps.
 - Do not reach too far out to one side or another when working off a ladder. Try to keep your belt-buckle inside the side-rails.
 - Secure the ladder to prevent displacement.
 - If an extension ladder is being used to gain access to a walking/working surface, the top of the extension ladder must extend three (3) feet above the work surface and tied off to prevent displacement.

Personal Fall Arrest Systems

When needed, Hygieneering, Inc. does maintain and use Personal Fall Arrest Systems consisting of whole-body harnesses and lanyards when required by OSHA regulations, contractor's safety program, and site conditions. Important concerns when using conventional fall protection systems, such as harnesses and lanyards, include: fit and condition of the harness, condition and use of the lanyard, and stability of the anchorage point. Note: Specialty training will be required on a case by case basis for any Hygieneering staff member that needs to utilize a fall arrest system to perform their job function.

In summary, the fall protection program shall limit maximum arresting force on an employee to 1,800 pounds when used with a body harness; be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level, and, where practicable, the anchor end of the lanyard shall be secured at a level not lower than the employee's waist; bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet; and have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

The following are general guidelines.

- a) Personal fall arrest systems (lanyards, connectors, harnesses, and lifelines) are provided, by Hygieneering, to each employee with potential exposure to fall hazards. Specific training on this PPE and fall arrest system will be provided on a project by project basis.
- b) Safety harnesses are defined as either a chest harness with straps over the shoulder and around the waist or a full body harness. Body belts are strictly prohibited and are not allowed on the job site. A harness must be worn where the possibility of a free fall exists.
- c) Shock absorbing lanyards shall be used as the connecting device between harness and anchorage.
- d) Lanyards shall be a minimum of ½ inch nylon or equivalent with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,000 pounds.
- e) The lanyard's snap hook must be of the locking configuration and in good condition. Both the deering and snap hook must have a minimum tensile strength of 5,000 pounds. The lanyard must be in good condition, with no frayed or torn webbing or rope. You may not hook two lanyards together to form a longer lanyard. Lanyards must have a minimum breaking strength of 5,000 pounds.
- f) Lanyards shall be secured above the worker to an anchorage capable of supporting a minimum dead weight of 5,000 pounds.
- g) Double lanyards and 100% tie-off are required when climbing to and from a boom lift basket or moving from one location to another.



- h) The harness must fit and be adjusted properly on the employees' body. The harness must be in good condition, with no frayed or torn webbing, or improperly functioning buckles. The dee-ring must be in the upper center of the back and the lanyard connected directly to it.
- i) The anchorage point shall be capable of supporting at least twice the weight expected to be imposed on it (Safety Factor = 2). They shall be designed, installed, and used under the supervision of a qualified person. The contractor can provide insight on possible or existing anchorage points for connecting fall protection
- j) Positioning device systems and their use shall conform to the following provisions:
 - Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet.
 - Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration, and defective components shall be removed from service.
 - The use of non-locking snap hooks are prohibited.
 - Anchorage points for positioning device systems shall be capable of supporting two times the intended load or 5,000 pounds, whichever is greater.
- k) The type of personal fall arrest system will match the particular work situation and will ensure potential free fall distance is minimal.
- l) Work environment is considered when choosing personal fall arrest equipment such as, acids, dirt, moisture, oil, grease, etc.
- m) Wire rope is not used where electrical hazards are anticipated.
- n) Fall protection equipment that has been subjected to a fall will be removed from service and replaced.
- o) The Project manager shall ensure that arrangements have been made in advance for the prompt rescue of employees in the event of a fall or shall assure the employees are able to rescue themselves.
- p) All fall arresting, descent control, and rescue equipment shall be approved and used in accordance with the manufacturer's recommendations.
- q) All personal fall arrest, personal fall restraint and positioning device systems purchased or placed in service after February 1, 1997, shall be labeled as meeting the requirements contained in ANSI A10.14-1991 American National Standard for Construction and Demolition Use, or ANSI Z359.1-1992 American National Standard Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components.
- r) When purchasing equipment and raw materials for use in fall protection systems, applicable OSHA, ANSI & ASTM requirements will be followed.
- s) Where the elevation is 25 feet or more above the ground, water surface, or continuous floor level below, and when the use of personal fall arrest systems, personal fall restraint systems, positioning device systems or more conventional types of protection are clearly impractical, the exterior and/or interior perimeter of the structure shall be provided with an approved safety net extending at least 8 feet horizontally from such perimeter and being positioned at a distance not to exceed 10 feet vertically below where such hazards exist, or equivalent protection provided safety nets shall extend outward from the outermost projection of the work surface as follows: Vertical Distance (VD) up to 5 feet requires 8 feet of Horizontal Distance (HD) - +5 feet up to feet of VD requires 10 feet of HD - More than 10 feet but not to exceed 30 feet of VD requires 13 feet of HD.
- t) When used to control access to areas where leading edge and other operations are taking place, the controlled access zone shall be defined by a control line or by any other means that restricts access. Signs shall be posted to warn unauthorized employees to stay out of the controlled access zone. The employer shall designate a competent person to monitor the safety of other employees.

Aerial Work Platforms

During some sampling operations, Hygieneering, Inc. may rent self-propelled elevating work platforms (aerial lifts) to provide a safe work surface at heights. The aerial lift will be inspected, used, and maintained in accordance with OSHA Subpart L Regulations, manufacturer's instructions, and ANSI/SIA A92.6 Standards. The aerial lift may not be field modified for any reason. The aerial lift must be inspected before each use.



The aerial lift's maximum weight load must not be exceeded. Before using the aerial lift, make sure there is a clear path of travel and there are no obstructions. Be aware of and stay away from all live or potentially live electrical wiring or equipment. The platform/lift must never be moved while extended and occupied. All guardrail openings must be closed off prior to elevating platform/lift. When work is being performed above 6 feet, all employees working on the platform must be properly tied off to the platform using a whole-body harness and lanyard. When needed, training will be provided on the safe use of a self-propelled elevating work platform.

This Fall Protection Program has two main elements:

- a) Fall hazard elimination and prevention
- b) Use of personal fall protection equipment

Fall hazard elimination and prevention consists of pre-job planning and proper use of scaffolds, ladders, aerial lifts, guard rails, etc. to eliminate fall hazards as much as possible.

Fall protection is required on roofs, floors, and other walking/working surfaces with unprotected edges and sides when the walking/working surface is more than 6 feet above lower levels. **IF THE EMPLOYEE CAN FALL 6 FEET OR MORE HE/SHE MUST BE PROTECTED.**

Pre-Job Planning

As part of the documented project safety, health, and environmental analysis, the Project Manager and competent person shall survey the fall hazards and determine the necessary engineering, construction, and safety procedures and controls necessary to eliminate fall hazards as much as possible. The fall protection plan shall be prepared by a qualified person and developed specifically for the site where the construction work is being performed and the plan must be maintained up to date.

The proper fall arresting system and the method of potential rescue for use on the project will be determined. A mechanism for the prompt rescue of employees in the event of a fall shall be included in the site-specific fall protection plan.

The Project Manager shall review the job site prior to work and arrange for appropriate rescue for the situation. Hygieneering will provide for prompt rescue of employees in the event of a fall or shall assure the employees are able to rescue themselves.

Ladders and Stairways

The following rules and regulations are general guidelines on how ladders and stairways should be constructed and safely used.

- a) Ladders should also be inspected by employees before each use. Unsafe ladders should not be used and the employee should report the unsafe condition to his supervisor.
- b) Wooden ladders are prohibited.
- c) Keep ladders free of oil, grease, ice and all other slipping hazards. Employees should remove mud, grease, etc. from their shoes before climbing a ladder.
- d) Ladders must be placed on a solid, level base, unless secured, to prevent accidental movement. Straight or extension ladders should be placed at a 4 to 1 pitch (one foot out for every four feet in height).
- e) The side rails of a portable ladder must extend at least 3 feet above the upper landing area that it serves. Ladders should be secured at the upper landing.
- f) Metal ladders shall not be used when the possibility of contact with electrical power exists.
- g) At least a 36 inch radius, clear of materials and debris, must be maintained around the top and bottom of ladders.
- h) Employees must never carry any object or load when climbing a ladder. Carry tools in a belt or pouch or use a hand line to raise or lower them.



- i) Employees should always maintain a three-point contact with the ladder. Keep two hands and one foot or two feet and one hand on the ladder at all times.
- j) To prevent loss of balance, employees should not reach out too far from a ladder in any direction-keep your belt buckle inside the rails. Move the ladder, as the work requires. Work facing the ladder and hold on with one hand.
- k) A stairway or ladder must be provided at all points of access where there is a break in elevation of 19 inches or more.
- l) All stairways must be properly lighted, maintained, and kept clean.
- m) All stairways over 30" high or with four or more risers must have at least one handrail. Unprotected edges of landings must have guardrails.
- n) All temporary construction stairways must have landings at least 30" deep and 22" wide.
- o) Where doors or gates open directly onto a stairway, a platform no less than 20" beyond the swing must be provided.
- p) Riser height must not vary more than 1/4" within any stairway, and stairway pitch must be maintained between 30 degrees and 40 degrees from the horizontal

Scaffolds

The Project Manager is responsible to assure that the specific building and safety requirements for each type of scaffold are adhered to. The following are some of the rules designed to promote safety in the use of steel scaffolding.

- a) No scaffold shall be erected, moved, dismantled, or altered except under the supervision of a competent person. This competent person must be knowledgeable in all safety and building requirements for the particular type of scaffolding being built. He must also have the authority to take prompt corrective action to protect employees from any hazards or dangers associated with the scaffolding.
- b) All scaffold components must be capable of supporting, without failure, at least four times the maximum intended load, including the footings. Never build scaffolds on objects such as barrels, boxes, loose bricks, concrete blocks, etc.
- c) All scaffold components shall be inspected by a competent person before each daily use. Check for cracks or bent parts, connectors, bracing, guard rails, access ladders, and footings. Never use any equipment that is damaged.
- d) Guard rails (minimum 38" high) and toe boards (minimum 4" high) shall be installed on all open sides and ends of platforms more than ten feet above the ground or floor. Scaffolds four feet to ten feet high shall have standard guardrails installed on all open sides and ends of the platform.
- e) All scaffold working platforms must be fully planked or decked. All planking must be scaffold grade material and extend over end supports not less than 6" nor more than 12".
- f) An access ladder or equivalent means of safe access must be provided. A retractable (yoyo) must be provided for any access ladder more than 20 feet in height if a rest deck is not provided.
- g) Scaffold platforms must be kept free of rubbish, snow, ice, oil or grease.
- h) Steel scaffold ladders get slippery. They should be cleaned and shoes cleaned before climbing. Remember to keep a three-point contact with the ladder at all times and never carry anything when climbing a ladder.

Guard Rails

Floor openings, roof openings, wall openings, open sided floors, stairway, ramps, platforms, and runways shall be guarded by a standard guardrail. Standard guardrails must meet the following general conditions. For more specific details see OSHA Standard 1926.500.

- a) A standard railing shall consist of top rail, intermediate rail, toe board, and support posts.
- b) The top rail shall be smooth surfaced and shall have a vertical height of 39" – 45" from floor, platform, runway, or ramp level.
- c) The intermediate rail shall be halfway between the top rail and the floor, platform, runway or ramp.



- d) A standard toe board shall be 4 inches minimum in vertical height from its top edge to level of the floor, platform, runway or ramp.
- e) Railings shall have the strength to withstand at least the minimum requirement of 200 pounds top rail pressure with a minimum of deflection.

Housekeeping

We can also reduce the number of falls by eliminating fall hazards on the job site. Secure footing is the prime requisite in avoiding falls, and good housekeeping is essential to good footing. The following housekeeping rules shall be adhered to by all employees:

- a) Clean up scrap on an “as you work” basis.
- b) Material should be stored neatly.
- c) Walkways must be free of cords, material, and all tripping hazards.
- d) Clean up oil, grease, water, ice, snow, etc. to prevent slipping.
- e) Always look before you step.
- f) Use adequate lighting.
- g) Floor openings must be covered with a cover large enough and rigid enough to prevent failure. Covers must also be secured to prevent accidental displacement.
- h) Never stand on chairs, crates, drums, or any other unstable object.
- i) Proper footwear must be worn at all times.

Anchorage Points

Properly planned anchorages are used, when available. In some cases anchorages must be installed immediately prior to use. A qualified person will ensure that anchorage points are designed by certified professional engineers. In other cases anchorage points are devised from existing structures (I-beams, large eye bolts, guardrails, railings, masonry, or wood members).

- a) Hygieneering is aware that the strength of the personal fall arrest system is based on the strength of the anchoring system.
- b) Anchor points must support a weight of at least 5,000 pounds of force for each employee attached.
- c) Should be located at a height that reduces free fall to 6 feet or less.
- d) Factors to consider are deceleration distance (shock absorbing lanyard) and elongation (lanyard stretching); and should be located so that if a free fall occurs, an attached worker will not collide with equipment or structures or contact any lower level.
- e) The lanyard is connected to an anchor point using a self-locking snap hook or to a tie-off strap.
- f) The tie-off point should be at or above the D-ring on the back of the employee’s harness to reduce free fall distance.

Each anchorage point on Hygieneering jobsites must comply with the following guidelines for safe usage:

- a) The tying of knots for anchor point attachments is prohibited.
- b) The swing fall must be reduced to a reasonably safe minimum and reduce the potential for collision injury and to allow for self-recovery.
- c) The anchor point must be continuous by design (to accomplish the task without intermittent fall hazards).
- d) The anchorage must be reachable, to permit connection without a hazard.
- e) The anchorage point must be compatible with the attachment method of the deceleration device (shapes compatible with snap hooks and eyebolt shapes).
- f) The method of attachment must not cause damage to the deceleration device (i.e. cannot loop lanyard around an angle iron which could cut the lanyard).
- g) The attachment method must not allow sliding-down, falls, or permit cutting the line.
- h) Must prohibit attachment of a lanyard to flanged edge without closure of the snap hook.
- i) Load bearing suspension and line and lifeline must be attached to separate support systems.
- j) The method of use must not force employees to disconnect because they cannot reach their task.
- k) All anchor points must be independent of each other.



Controlled Access Zones

When used to control access to areas where leading edge and other operations are taking place, the controlled access zone shall be defined by a control line or by any other means that restricts access. Signs shall be posted to warn unauthorized employees to stay out of the controlled access zone. Hygieneering shall designate a competent person to monitor the safety of other employees.

Equipment Maintenance

Fall protection equipment shall be inspected before each use by the user.

The following guidelines should be followed when inspecting the equipment.

- a) Inspect component hardware. These items must not be damaged, broken, distorted, or have any sharp edges, burrs, cracks, worn parts, or corrosion. Make certain the connecting hooks work properly. Hook gates must move freely and lock upon closing. Make certain adjusters (if present), work properly.
- b) Inspect webbing. Material must be free of frayed, cut or broken fibers and stitching. Check for chemical or heat damage (indicated by brown, discolored, or brittle areas). Check for ultraviolet damage (discoloration and presence of splinters and slivers). Webbing must be free of knots, excessive soiling, heavy paint buildup and rust staining.
- c) Inspect labels. All labels must be intact and fully legible.

Any equipment found defective or suspect during inspection should be immediately removed from service and destroyed or sent to a factory authorized service center for repair.

Any piece of fall protection equipment which has been subjected to fall arrest or impact forces must be immediately removed from service and destroyed.

Training and Documentation

All employees shall be trained to recognize and avoid fall hazards on the job site. Employees shall also be trained in the proper use of personal fall arrest systems on an as needed basis.

The Project Manager has the responsibility to ensure that all his employees are properly trained.

At the completion of the training, each employee shall be tested to assure that he understood the material being presented.

For training beyond awareness, when there are recognized fall hazards on a job, separate written plan shall be prepared by a competent person with fall protection training and approved by the Certified Safety Professional managing the project. In addition, written training records shall be maintained and include the trained person's name, date of training, and the competent person conducting the training. The Project Manager is required to sign off in the project assignment sheet that the appropriate level of training was provided for the project.

Re-training shall be provided when the following are noted: 1) Deficiencies in training. 2) Work place changes. 3) Fall protection systems or equipment changes that render previous training obsolete.

Inspections conducted as part of this program shall be documented. All accidents and serious incidents (near accidents) must be investigated. In addition, if deficiencies in the program are identified through the investigation, the fall protection plan shall be modified as necessary.



ATTACHMENT 2

BENZENE SAFETY BRIEF



MONTHLY SAFETY BRIEF: BENZENE

Now, for those of you that have been commissioned to work on a longer-term project at a refinery, you know we have a specific benzene awareness policy in place in our safety manual:

7.26 PETROLEUM SITE BENZENE BUTADIENE AND HYDROGEN SULFIDE AWARENESS POLICY (PAGE 113)

This policy contains more detailed HazCom information than this brief, but it is there for reference if you would like additional information!

Hygieneering technical staff performs duties at petroleum facilities and other locations that may contain benzene including personal air sampling, area air sampling, direct read air monitoring and worker observations. Hygieneering workers are typically either outside of locations or spend very little time in locations where there may be exposure to benzene. Anticipated potential exposures to benzene are well less than related OSHA limits based on our job functions.

Benzene is recognized by OSHA as a Hazardous and Dangerous Substance and has a standard of [1910.1028](#). The following general information (excerpts) on benzene is taken from Appendices A, B and C of the OSHA Benzene standard, Title 29 Code of Federal Regulations 1926.1128:

Exposure Limits and Qualities of Benzene

- A. Substance: Benzene.
- B. Permissible Exposure: Except as to the use of gasoline, motor fuels and other fuels subsequent to discharge from bulk terminals and other exemptions specified in 1910.1028(a)(2):
 - 1. Airborne: 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. An organic vapor cartridge in your respirator will work for benzene.
 - 2. Dermal: Eye contact shall be prevented and skin contact with liquid benzene shall be limited.
- C. Appearance and odor: Benzene is a clear, colorless liquid with a pleasant, sweet odor. The odor of benzene does not provide adequate warning of its hazard.

Benzene is naturally occurring organic compound that is classified as a hydrocarbon. Benzene is one of the 20 most frequently used chemicals in the United States; featured in many plastics, rubbers, dyes, detergents, and gasoline. Benzene may also be found outside the work zone in volcanic eruption, car exhaust, wildfires, and even cigarette smoke. Benzene enters the body through respiration and dermal contact.

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 swallow it.
- Effects of overexposure:
 - 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.

POTENTIAL HEALTH EFFECTS

- [Recognized carcinogen](#)
- Leukemia and cancer of the blood
- Skin irritant
- Anemia
- Nervous system irritant: headaches, tremors, nausea, dizziness

CONTROLS

- Elimination/substitution of benzene products
- Respiratory protection compliant with [OSHA 1910.134](#)
- Quitting cigarettes
- Conducting a workplace environmental survey assessment
- Conduct blood lead level testing for workers who are potentially exposed to benzene
- Training



BENZENE QUIZ

- 1) Which of the following is not a source of benzene?
 - a. Volcanic eruptions
 - b. Tobacco smoke
 - c. Gasoline
 - d. Nuclear waste

- 2) Which of the following is a known health affect associated with benzene over exposure?
 - a. Loss of vision
 - b. Leukemia
 - c. Kidney disease
 - d. None of the Above

- 3) An organic vapor cartridge in your respirator is the appropriate selection to protect you from benzene.
 True
 False

- 4) OSHA has a specific standard just for benzene?
 True
 False

- 5) You can be exposed to benzene outside of the work place?
 True
 False

- 6) Cigarette smoke has no effect on your exposure to benzene.
 True
 False

Instructor(s) – John Feller, CIH, CSP

SCORE: PASS / FAIL

Employee Signature



Supervisor Signature

Date