

Chapter 9

Other Safety Considerations

Because the inspection environment for evaluating compliance with the asbestos NESHAP regulation is usually a building awaiting demolition or in some stage of renovation, increased asbestos exposure is only one of the many hazards an inspector may encounter on the job. This chapter enumerates the risks associated with worksite conditions and recommends safety procedures inspectors should follow.

Maintaining a safe worksite is a major concern on commercial and industrial sites. Many of these locations have staff whose sole job is to enforce a wide variety of safety regulations. EPA asbestos inspectors may be required to comply with onsite safety standards.

Information on a wide variety of personal protection topics can be obtained from both OSHA (www.osha.gov) and NIOSH (www.cdc.gov/niosh), and other agencies.

Following are brief discussions of several health and safety issues that may arise in the course of conducting asbestos NESHAP inspections.

Heat Stress

All forms of heat illness are caused either directly or indirectly by the body's attempt to maintain its normal temperature of 98.6°F. Physical activity causes an increase in the body's metabolic rate, thereby increasing body temperature. The body attempts to dissipate heat via sweating. The loss of water and electrolytes via perspiration is the main factor responsible for all forms of heat stress, which include heat cramps, heat exhaustion, and heat stroke.

Heat cramps are painful muscular contractions of the arms, legs, hands, and trunk. They typically affect the lower legs first and are always preceded by marked sweating. Treatment consists of leaving the hot area and replenishing liquids.

Heat exhaustion usually results from dehydration. The individual becomes pale, has cold, clammy skin and is weak to the point of exhaustion. Other symptoms may include headache, nausea, vomiting, muscle cramps, diarrhea, and giddiness. The blood pressure is low and the body temperature may be above or below normal. There is no increase in the body core temperature. If heat exhaustion occurs, the individual should rest in a cool area and drink ample fluids.

Heat stroke occurs when the body's sweating mechanism shuts down entirely. The skin becomes hot and dry and the body temperature quickly rises. The afflicted person must be cooled down immediately and, if conscious, encouraged to drink cool liquids. Medical help

must be sought, for the condition may progress to delirium, stupor, unconsciousness, convulsions, deep coma, or even death in 30-50 percent of all cases.

All forms of heat stress can be prevented almost entirely by taking a few simple precautions. Since dehydration is the main contributing factor to the development of heat stress, adequate fluid intake is essential. Plain water is the best liquid, but fruit juices (not fruit drinks, which contain inordinate amounts of sugar and may cause excessive thirst) may also be used. One should avoid all forms of alcoholic beverages, and tea, coffee, and other caffeinated drinks, for they are diuretic.

Use of electrolyte replacement drinks is usually not necessary. Since peoples' diets nowadays supply vast amounts of electrolytic substances, it is highly unlikely that anyone, even with profound perspiration, will suffer from a deficiency of them.

Other measures that can be taken to reduce the possibility of developing heat stress include use of a powered air-purifying respirator or a supplied air respirator (which help cool the face and lungs), increased local exhaust ventilation, and gradual acclimatization to the hot environment. Keep in mind that any air-filtering respirator dehydrates breathed air and can contribute to dehydration and heat stress.

For any inspection lasting more than 15 minutes in an atmosphere of 70°F or higher, the inspector should follow the recommendations found in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* [DHHS (NIOSH) Publication No. 85-115].

Climbing & Fall Hazards

OSHA's *Safety and Health Regulations for Construction, Subpart M, Fall Protection* found at 29 CFR Part 1926 Subpart M specify training and other requirements for the safe use of onsite equipment (ladders, scaffolding, etc.). In general, when on a walking/working surface with an unprotected side or edge which is 6' or above a lower level, an employee must be protected from falling by the use of guardrail, safety net, or personal fall arrest systems (e.g, body harness, anchoring lanyards). Users of such equipment must be properly trained and the devices themselves properly maintained (Visit: www.osha.gov/SLTC/fallprotection.construction.html for more information.).

Since most employers on a construction site do not provide visitors or inspectors safety equipment, be sure to bring appropriate devices and know how to use them.

In demolition/renovation jobs, numerous climbing and fall hazards exist. Railings and other structures may be improperly secured or may have been removed entirely during salvage operations. Available scaffolding and ladders may not be in good condition. In addition, wearing a respirator or other personal protection equipment may restrict an inspector's vision or mobility, thereby creating more need for caution when climbing or on elevated surfaces.

Scaffolding

Most asbestos renovation projects involve the use of both stationary and mobile scaffolding. OSHA standards require that when freestanding mobile scaffolding is used, the height must not exceed four times the minimum base dimension. This requirement is based on the fact that scaffolding is easily overturned. For mobile scaffolding on which workers can ride, the minimum base dimension should be one-half the height. OSHA also has established standards regarding guardrails, kickboards, and planking overhang. (See 29 CFR Part 1910 Subpart D "Walking/Working Surfaces.")

Ladders

Simply use common sense when using ladders. Be sure a stepladder is fully open and face the ladder when using it. Check to see that all the steps are in good condition and never stand on the top step.

Examine extension ladders for missing safety feet, proper lean ratio (4:1 - e.g., the base of a 12' ladder should be approximately 3' from the wall), and sufficient overhang (if necessary) before use. Use both hands while climbing and never climb a ladder with someone else already on it.

Roofs

Roofs of buildings can be extremely hazardous. Inspectors should be aware of fall hazards, site-specific fall protection programs and requirements. Individuals have unwittingly stepped on and broken through skylights that have been painted over to match the roof. Roofs with accumulations of snow, ice, or other material, or those whose deck panels cannot support additional weight are extremely dangerous. Avoid walking on a sloped roof without proper fall protection.

Work Surface Hazards

Standard preparation of a worksite involves the placement of polyethylene sheeting on the floor. Amended water, often used to ensure the safe removal of asbestos, can make the floor very slippery, so walk cautiously and wear appropriately sized, non-slip footwear.

Also be careful not to trip on airlines, electrical cords, bags of waste, stripped asbestos, and worksite debris.

Wear steel-toed footwear that also has a steel-shank for protection from nails and other sharp objects. Knee-high rubber boots with these features are commonly used on abatement sites and can be easily decontaminated.

Poor Illumination Hazards

Inspectors may find that active removal operations have the best lighting since workers need to see well in order to properly strip and clean asbestos-coated surfaces. High humidity and falling ACM debris, however, may reduce visibility in the work area.

Pre-removal or post-removal inspections may need to be done with no onsite electrical lighting available. In order to see above suspended ceilings or into crawl spaces, etc., an inspector will need to use a powerful flashlight.

Hazards of poor lighting include risk of head injury from suspended objects (low hanging pipes, rebar, light fixtures, etc.), and other injuries due to tripping or falling over objects.

Electrical Hazards

One of the most common hazards, and one that gives the least warning, is electricity. Incorrect wiring, improper grounding, and lack of proper shielding result in a great number of electrocution deaths each year. Many of these fatalities result from contact with only 120 volts. The use of wet methods when removing asbestos increases the potential for electrical shock, especially when a person is working around electrical panels, conduit, light fixtures, alarm systems, junction boxes, computers and transformers. Where injury may be caused by electrical hazards, protective gear (helmets, insulated gloves, etc.) should be worn.

OSHA requires that hazardous energy (including but not limited to electricity) be controlled through the use of a Lockout/Tagout (LOTO) program. LOTO refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities. A designated individual must turn off and disconnect the machinery or equipment from its energy source(s) before performing service or maintenance and must either lock or tag the energy-isolating device(s) to prevent the release of hazardous energy and take steps to verify that the energy has been isolated effectively.

Following the procedures below can greatly reduce the risk of electrical shock:

- Have the site foreman escort you and explain how the electrical system has been ground faulted or LOTO (as required by OSHA);
- If deemed necessary, use non-conductive sample collection devices (wood, plastic, rubber);
- Use extreme caution when inspecting around energized wiring or equipment;
- Use care not to break through insulated coverings during inspection activities;

- Avoid accumulated water if an electrical wire or extension cord is lying in or near it; and
- Consider electrical equipment and lines to be energized unless tested and determined firsthand otherwise.

Miscellaneous Hazards

Falling Objects

Where there is a possibility of head injury from impact or from falling or flying objects, from high voltage electrical shock and burns, inspectors should wear head protection that meets ANSI Z89.1-2003 safety requirements for industrial head protection.

Head protection commonly used on construction projects is rated Type II (impact protection from top or sides) – Class E (electrical protection).

Inspectors should not enter industrial sites without appropriate head protection (hard hat).

Structurally Unsound Building

To the greatest extent possible, determine the soundness of a structure before entering. Older buildings in a state of decay or undergoing renovation may have stairs or floors in danger of collapse. If the area appears unsafe, leave immediately, taking care to walk along the outer edge of the floor or stairs where there is more structural support.

Always test stairs before applying full body weight since they may be in a deteriorated state. In more rare cases, drug addicts/vagrants may have installed thin, false steps as an alarm mechanism.

Be aware that salvage operations can create unsafe conditions (boiler footings are cut; elevator doors, railings, metal stairs are removed, etc.) and buildings damaged by fire or natural disasters are generally unsafe.

Under such conditions, sample only those materials that can be reached without compromising personal safety. When in doubt, do not enter.

Chemical/Explosion Hazards

Some asbestos demolition/renovation activities may be conducted in buildings that have chemical and/or explosion hazards. Facility emissions (e.g., sulfur dioxide at copper smelters), PCBs in ballasts/transformers, manufacturing chemicals, acid baths, mercury from broken fluorescent lights, thermostats, and other switches, chemical lines in the work area and abatement chemicals may be encountered. Select and use appropriate personal protective (clothing and respirators) for these hazards. (e.g., organic vapor respirator cartridges for spray adhesives, ammonia cartridges for Spray Poly[®] or when at fertilizer manufacturing plants) or combination cartridges for multiple hazards.

Wear knee-high rubber boots where solvents are used in the removal of floor tiles. Some individuals (usually after repeated exposure to the liquid or fumes) can develop severe dermatitis reactions to the chemicals.

Some inspectors become sensitive to rubber in respirator face pieces and should wear a silicone respirator instead.

To avoid potential allergic reactions to latex, use gloves made of other substances. (See NIOSH Publication 98-113: *Latex Allergy - A Prevention Guide*).

Radiation Hazards

Improperly vented basements, especially in the northeastern US, may contain radon, a radioactive gas known to cause lung cancer. Inspectors may also be exposed to americium, a radioactive component of smoke detectors.

Biological Hazards

Numerous biological hazards exist at worksites. Inspectors may be exposed to pathogenic microorganisms via leaking sewer lines, insects, animals, and humans. Infection may occur due to direct contact or inhalation. Some example carriers and the associated medical issues include the following:

- Ticks – Lyme disease, Rocky Mountain spotted fever, other bite infections
- Fleas - bubonic plague, bite infections
- Mosquitoes – encephalitis, West Nile virus
- Bees, wasps – stings, anaphylactic reactions
- Birds (feces) – histoplasmosis
- Small animals – rabies, hanta virus
- Humans - AIDS, hepatitis

Be aware that vacant and abandoned properties that are subject to demolition may contain any of a variety of hazards including human and animal feces, drug paraphernalia, illicit drug manufacture residues, and other harmful substances.

Common precautionary measures include administering vaccines for hepatitis A and B as well as tetanus. Such vaccines are helpful in avoiding the respective diseases for a period of time. The effectiveness of tetanus shots diminishes over time and a tetanus booster is recommended every ten years.

Several types of harmful plants may be encountered. Learn to recognize and avoid plants such as poison ivy, poison oak, poison sumac and stinging nettles.

Be particularly wary when examining debris piles or when in abandoned buildings, attics, cellars, crawl spaces, and other confined areas (even portable toilets) since harmful creatures may reside there such as rodents, stray dogs, skunks, raccoons, poisonous snakes and spiders, scorpions, or bats. Harmful insects, such as bees (including Africanized honey bees), wasps, fire ants, and mites are additional hazards inspectors may encounter.

Always have a first aid kit containing appropriate medical supplies on hand. Carry bee sting and/or snakebite kits where necessary. If warranted, wear a medical alert bracelet or necklace to inform emergency responders and work site management of potentially serious medical conditions such as diabetes, allergies to penicillin or bees, etc.

Confined Space Hazards

OSHA's confined space regulations that may be found at 29 CFR 1926.21(b)(6).

A confined space:

- is large enough and configured such that a person may enter;
- is not designed for continuous human occupancy; and
- has limited or restricted entry or access.

In some cases one may have to obtain a permit before entering a confined space. The permit may require air sampling and very specific procedures for entry, management and emergency rescue.

Any poorly ventilated area (e.g., a crawl space, attic, manhole, or other confined space), areas which contain chemical, natural gas, or sewer lines, sites where kerosene heaters or dry ice are in use, or where halon fire-suppression equipment is located, may be oxygen-deficient (an oxygen deficient atmosphere has less than 19.5% oxygen). Use supplied air respirators or self contained breathing apparatus under these conditions.

Claustrophobia

Some individuals become claustrophobic when wearing full-body protection or full face respirators. They may become panicky and subsequently injure themselves and others. To avoid such a situation, gain familiarity and comfort with such protective gear before use on an inspection site.

Noise Hazards

Always wear hearing protection when necessary. Moldable inserts provide the minimum acceptable hearing protection and are often sold in pre-packaged pairs.

Machinery Hazards

Be exceptionally cautious when visiting sites where power washers, shredders, bead-blasters, electrical chisels/chippers, rotating blade scrapers/saws, high-powered vacuum machines, or other power tools are in use. Stay away from such machinery to avoid possible injury.

Thermal Hazards

Inspectors may conduct inspections in areas with live steam lines. Since surface temperatures of these lines can exceed 600°F and pinhole leaks may be invisible, be extremely careful.

Avoid using protective clothing with low melting points near high temperature sources such as steam lines, quartz and halogen lights. The melting point of Kleenguard® is around 300°F and for Tyvek® it is around 275°F. Contact with such sources can melt these fabrics, which then adhere to the skin.

Use commercially-available, thermally-resistant protective clothing where thermal hazards exist.

Fire/Explosion Hazards

Since many types of electrical equipment, heat sources, flammable chemicals and materials (e.g., polyethylene) are present at most abatement sites, be sure to locate fire extinguishers and emergency exits upon entering the site. Gasses from burning polyethylene are extremely hazardous. In the event of fire or explosion, stay low and exit the work area immediately. Requirements for normal work site exit procedures such as showers are waived during an emergency event.

During pre-demolition inspections of buildings to be imploded, be aware that dynamite charges may already be set. Such areas should be avoided unless qualified site guides are available to take the inspector through the facility. If an inspection is warranted, all precautionary procedures must be followed, as prescribed by the applicable facility representative(s).

Water Hazards

Asbestos inspections may need to be done in such places as offshore oil rigs, beneath bridge piers, and at other structures along bodies of water. Appropriate flotation devices should be used wherever a drowning hazard exists. Be sure to bring a flotation device to the site if a possibility exists that a misstep or other accident could cause an individual to fall into the water.