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This Good Practices Manual has been prepared for insulation installers to help them become more aware of some of the potential hazards of their day-to-day work so that they won't become a statistic. Not every insulation installer will encounter every hazard discussed. Nor are these hazards the only ones that the worker may face on the job. But the more workers know about the hazards or potential hazards of a job the safer they can work. If they cannot stay away from the hazard, they can learn a step by step procedure designed to lessen the hazard, including wearing protective clothing as instructed.

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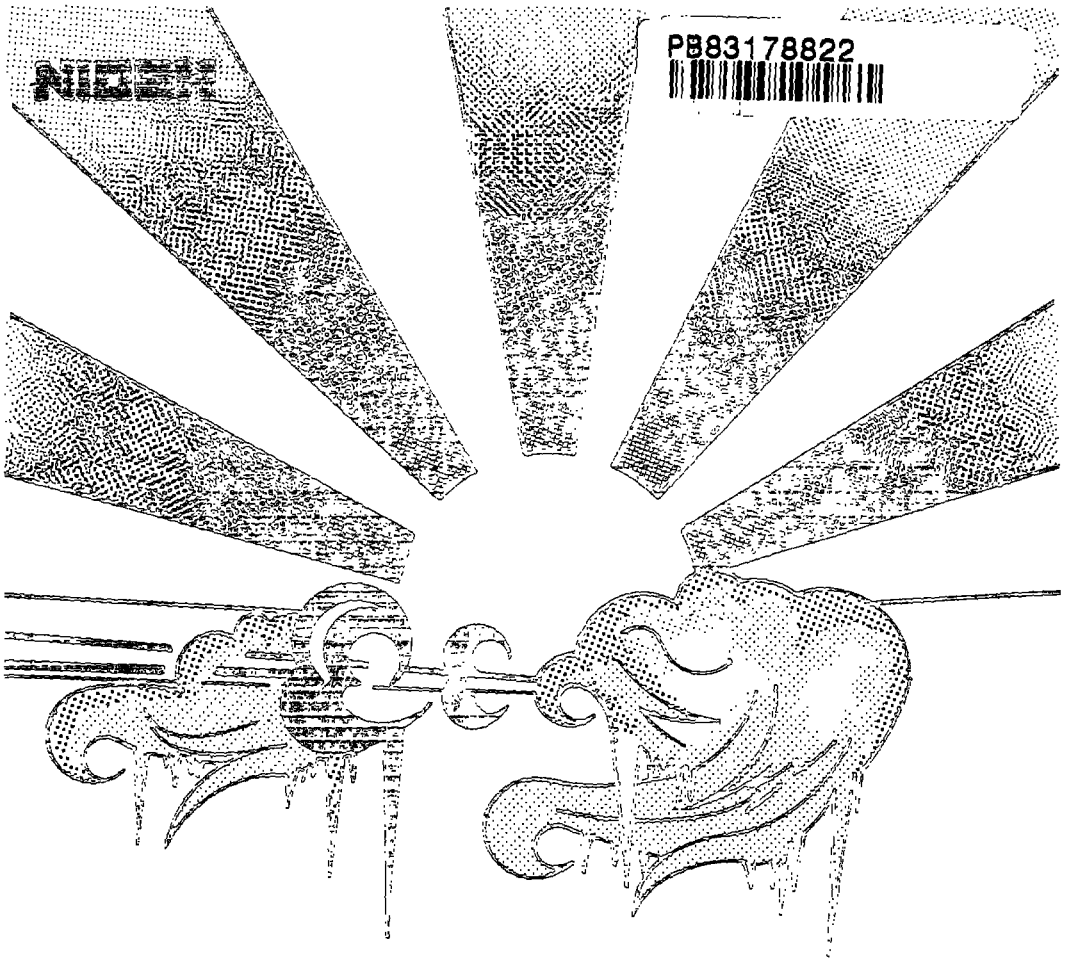
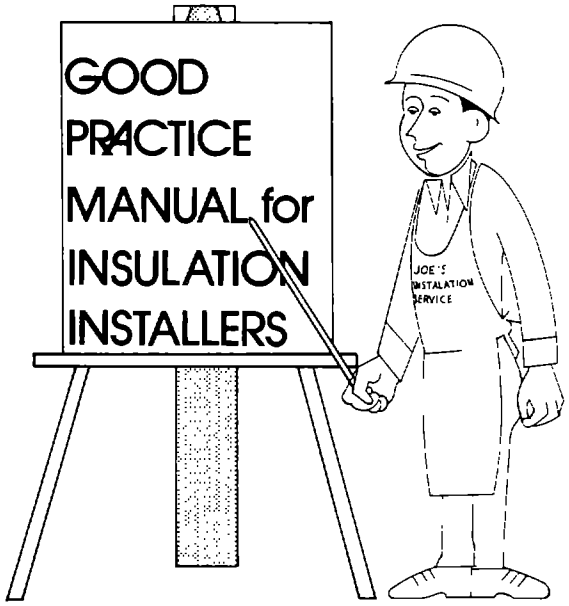


# GOOD PRACTICE MANUAL FOR INSULATION INSTALLERS



U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
National Institute for Occupational Safety and Health




U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
National Institute for Occupational Safety and Health
Division of Technical Services
Cincinnati, Ohio
**AUGUST 1977**

DHEW (NIOSH) Publication No. 77-188

Division of Technical Services
National Institute for
Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, Ohio 45226

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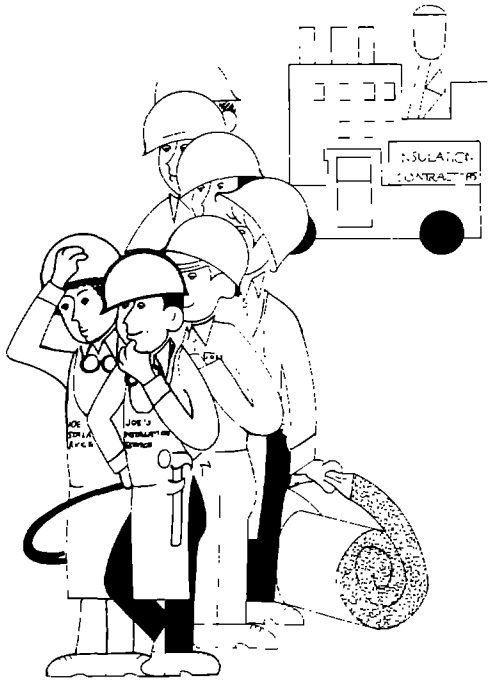
# INTRODUCTION

Based on current statistics, during any 1 year one insulation worker out of five will be injured or be sick because of job exposure. About 1 out of 16 will lose workdays because of the injury or illness. On the average, this means 14 lost work days—that's nearly 3 weeks of lost pay.

This Good Practices Manual has been prepared for insulation installers to help them become more aware of some of the potential hazards of their day-to-day work so that they won't become a statistic. Not every insulation installer will encounter every hazard discussed. Nor are these hazards the only ones that the worker may face on the job. But the more workers know about the hazards or potential hazards of a job the safer they can work. If they cannot stay away from the hazard, they can learn a step by step procedure designed to lessen the hazard, including wearing protective clothing as instructed.



You, the insulation installer, should read this booklet all the way through. Then, read those parts again that apply to your job according to your own experience. Discuss some of the points with your fellow workers. Discuss them with your supervisor.

There is a list of NIOSH Regional Offices in the back of this booklet. If you need more information, contact the nearest NIOSH Regional Office.

# GENERAL

Health hazards of the insulation industry have caused insulation installers to experience high mortality rates due to such malignant and nonmalignant lung diseases as absestosis, lung cancer, influenza, silicosis, and emphysema.

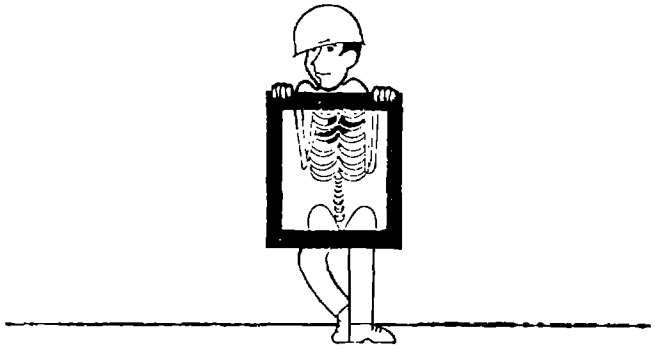
Researchers believe that these illnesses are due to inhaling dusts from some of the commonly used insulation materials. You have probably worked with some of these materials yourself.

Vermiculite (expanded)
Slagwool and Rockwool fibers
Asbestos fibers (cement, sprays, etc.)
Gypsum hair felt insulation
Paper (impregnated) insulation
Portland cement
Fiber glass
Aluminum silicate (ceramic) fibers
Cork insulation
Magnesium carbonate
Polyurethane foam
Polystyrene
Adhesives (typical solvents—toluene, ethanol, normal hexane)
Bentonite clay
Calcium carbonate

(Note: the order of this list of substances is no indication of the degree of hazard associated with the inhalation of their dusts or fibers or the degree of skin irritation they can cause. Not all of the substances have been scientifically proven to cause respiratory problems, but even a nuisance dust should be avoided in high concentration.)

# ASBESTOS

Some of you already know that asbestos is a hazardous material. Breathing asbestos fibers can directly cause asbestosis and several kinds of lung cancer. These diseases are found more frequently in workers who are exposed to asbestos and smoke than in those that are non-smokers.



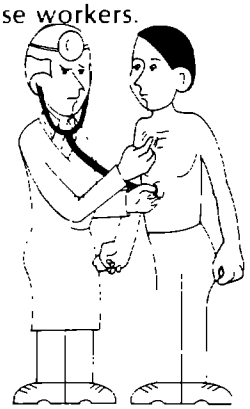
Asbestosis is a lung disease characterized by scarring and thickening of the lung wall. Breathing becomes difficult and this, in turn, causes a strain on the heart. Asbestosis appears between 10 to 20 years after initial exposure to asbestos fibers.

Cancers related to exposure to asbestos are cancer of the chest or abdominal lining, cancer of the trachea, cancer of the colon and stomach, and cancer of the lung. Cancer of the lung is the most prevalent.

Because of its direct relation to disease occurence, asbestos should no longer be used as an insulating material. But workers are still exposed, particularly in demolition work and repair jobs where old asbestos insulation must be torn out or replaced.

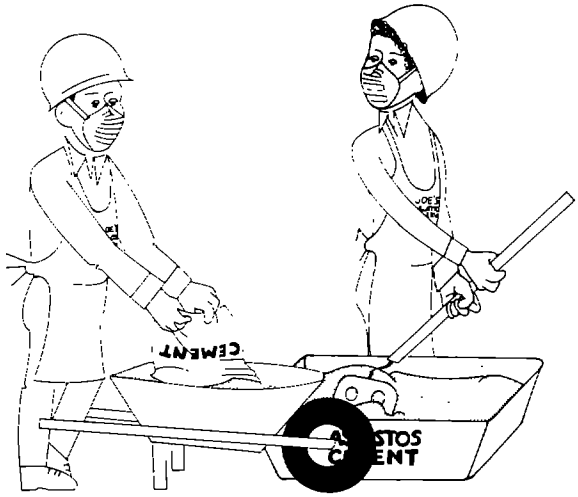
In recognition of the health hazards associated with asbestos, Federal regulations under the Occupational Safety and Health Act, have imposed limits for exposure to asbestos dust (fibers). The particular regulation for asbestos dust limits the number and size of the fiber in the air you breathe while at work, both on an 8-hour work day basis and as an absolute maximum concentration.

The same regulation also requires the employer of workers exposed to asbestos to take steps to protect the health of those workers.



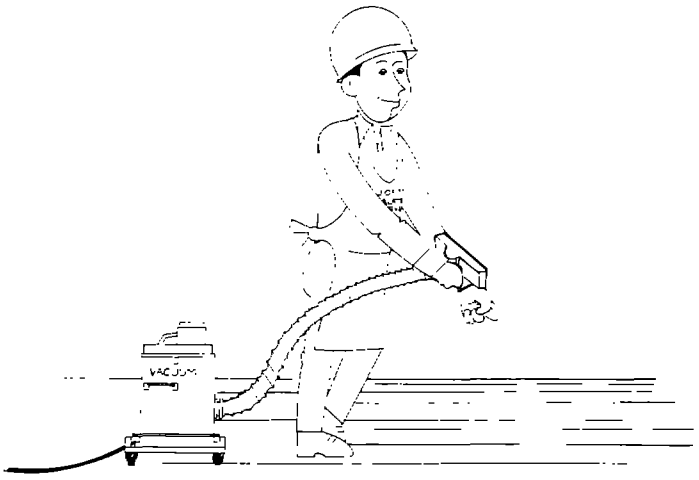
Part of the responsibility for healthy and safe working conditions rests with the worker. Insulation installers must adopt ways of doing their jobs which will lower the asbestos dust level and, where necessary, they must wear protective respiratory equipment.

There are numerous jobs that create asbestos dust. Some of them are: tearing out old or unusable insulation, mixing asbestos cement, cutting and shaping materials which contain asbestos, and cleaning up waste and debris that contain asbestos. Of course, there are other examples.



## *WHAT PRECAUTIONS CAN BE TAKEN?*

Insulation installers should know that tearing out old and unusable insulation containing asbestos will more than likely involve dust levels higher than the Federal regulations allow. When this happens, your employer must protect your health by providing approved type respirators. He must also provide any required protective clothing, means for laundering the protective clothing, and facilities for you to bathe and change into your "street clothes" (e.g., change room and shower) before leaving work. He must also provide a means for vacuuming off the protective clothing so that movement and activity will not cause asbestos particles to become airborne and spread the contamination.

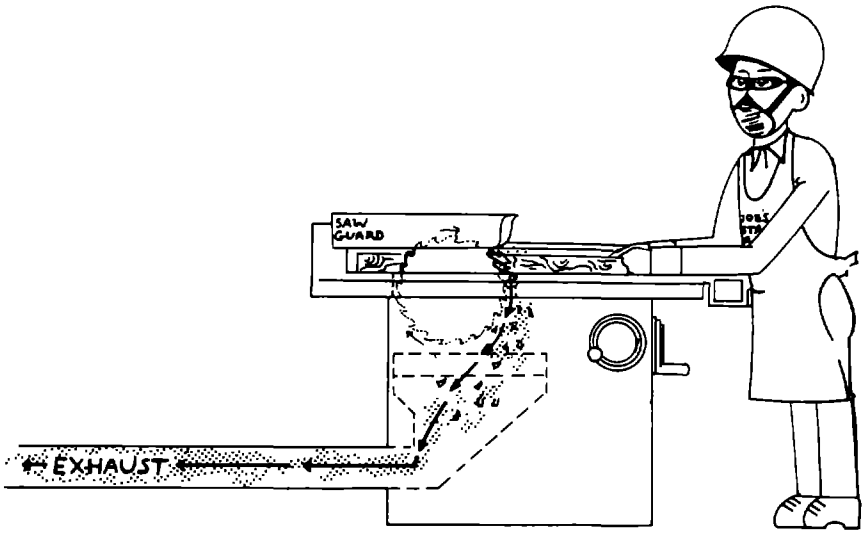


If you do not know what the dust level is, ask your foreman or supervisor. Where asbestos dust is involved, your employer is required to monitor the work environment air samples and determine the exposure, if any. Where sampling is impractical (for example on a demolition site), respirators should be worn as a matter of course. Respirators are also worn

until the results of sampling can be determined.

When you are first issued a respirator, your employer is required to see that you are instructed in its proper use and care. This includes proper fitting; the limitations, if any, of the respirator; and its proper cleaning and care. If, for any reason, you find that you cannot work in a respirator—inform your supervisor. Some people, due to their physical characteristics, just cannot wear a respirator. It's better to be changed to another job than to impair your breathing capacity and possibly endanger your health.

Another job where asbestos fibers may be liberated is in shaping and cutting to size materials which contain asbestos. An example is preformed insulation for hot liquid lines.




All cutting cannot be done in the shop. Last minute fitting may have to be done on the job site. Whether cutting in the shop or on the job site, the residue must be cleaned up by local exhaust (if done by powered saw) or by vacuum (if cut manually). It is never appropriate to sweep asbestos scrap or debris. Sweeping only re-suspends large amounts of asbestos fibers in the air you breath. If sweeping is the last resort, at least wet down the area to be swept—and always wear your respirator.

Major cleanup jobs can be particularly dusty with lots of contaminated debris that must be disposed of. As mentioned before, eliminate as much of the dust and particles as possible using a vacuum. Don't stir up the dust by sweeping. The remaining debris should be placed in nonporous containers (e.g., plastic bags), securely tied, labeled "asbestos waste," and removed from the job site for burial. This method will prevent the spread of asbestos contamination around the work area and prevent it from migrating into nearby areas. One way to make clean-up easier is to spread a large drop-cloth to catch waste materials and to keep dust from spreading.


If you work with asbestos in any form, showers and change rooms at work are important to you. Don't carry asbestos contamination home with you on soiled work clothes. Experience has shown that the worker is not the only one endangered from the effects of asbestos dusts. Family members of workers who have worked with asbestos in past years are showing a high rate of lung disorders. If you don't

shower and change clothing, asbestos particles can "ride" home with you on your work clothes, shoes, your body, and in your hair. Anyone you come in contact with may be exposed to the same harmful material. Granted, the chance of exposure will not be as great or the level as high as in the shop or job site. It just makes good sense, and is well worth the effort, to take all possible precautions to protect both yourself and your family.

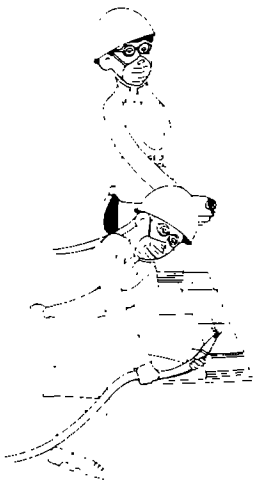

## *RECOMMENDED WORK ROUTINE*

- Begin your work-day by going to change room and changing into work (protective) clothing. Obtain proper respirator from its storage place. Check the respirator for fit **before** entering a contaminated area.
- End work-day by vacuuming off your work clothes and respirator. Clean and disinfect your respirator. Change its filter (depending on type of respirator) if necessary. Store your respirator. Proceed to the change room and remove your work clothing. Either hang them up for

later re-use or deposit them into a container for laundering. Proceed to the shower. Don't neglect your hair. Don your "street" clothes and go home to join your family. You'll feel good knowing you've done your part in protecting them from a possible health hazard.

Other "Tips" for working safely where asbestos may be a health problem—

- Wet down waste materials before removing them wherever its practical to do so.
- Limit the area where dust and particles are produced.
- Make sure local exhaust systems are working properly (for example, over the table saw). Make sure that local exhausts do not mix into the general ventilation system.
- Practice good housekeeping in the work area by removing dust and debris. Remember—vacuum, don't sweep!



**Wet Down Dusty Material Where Possible.**

# CONTROLS

Controls available for preventing exposure to contaminants, whether asbestos or other dusts, fibers, or particulate matter, include:

Engineering controls
Administrative controls
Substitution of materials
Control of work practices
Protective equipment

(Note: The contaminant or hazard involved and the location of the work site will determine which controls are feasible and most effective.)

## *ENGINEERING CONTROLS*

Total enclosure of a process is an example of an engineering control. This, of course, would not be feasible on a construction job or demolition site. It would be beneficial and feasible in the manufacturing of insulation products. Local exhaust ventilation is an engineering control. It works like a vacuum enclosure or partial enclosure around the immediate location where contamination is generated or given off. A local exhaust hood surrounding a table saw blade is an example. The movement of air into the exhaust hood must be rapid enough to "capture" the dust and particles. The local exhaust system must also prevent the contaminant from entering the breathing zone of the worker.

General ventilation is another engineering control which normally supplies fresh (sometimes conditioned) air to the workplace. In cases where contamination is not too great, general ventilation is sufficient to "dilute" contaminants to the point that they do not pose a serious hazard. Remember—only air sampling can verify if this is true. If additional mechanical ventilation is required, the services of a mechanical engineer may be needed.

## *ADMINISTRATIVE CONTROLS*

Limiting the length of time the worker is exposed to a hazard is an administrative control. Regulations are

often written expressing the permissible exposure based on a "time weighted average." If periods of exposure are spread out, it is possible for a worker to work in a contaminated area without being subjected to undue danger. Rotating two or more workers in order to shorten the exposure time of all the individuals is another administrative control. Keeping out persons not actually working in the hazardous area is another administrative control. Administrative controls are often used where noise or heat stress is the problem. In the case of heat stress, the primary administrative control is rotating workers to allow the exposed individual to recuperate or recover.

## *SUBSTITUTION OF MATERIALS*

In many industries,it has proven to be advantageous to find substitute materials to replace hazardous materials. The ideal situation is to substitute a material that has no health hazards at all and does the job just as well. In many industries,they have been successful in doing this — in some instances, at greater cost.

When it comes to the workers' health and well being, there really is no choice. Either control the hazard, eliminate it by substitution, protect the worker by protective equipment, or, when all else fails, discontinue the process that presents the hazard.

## *CONTROL OF WORK PRACTICES*

Here is where you, the worker, can make your greatest contribution to a safer, healthier workplace! Many times an employer finds it necessary to establish very rigid work rules for a particular job—even spelling the job out step-by-step and the sequence of the steps. For example, there's a very good reason, when mixing acid with water, that the acid be added to the water, never water to the acid. Mixing in the wrong manner can cause a violent reaction leading to skin burns, even blindness. Another example of this type of control is to wet-down first if sweeping of asbestos residue is necessary. The control (wetting-down) is to prevent the asbestos from becoming airborne.

## *PROTECTIVE EQUIPMENT*

When there's danger of a hazardous exposure, one of the controls possible is for the worker to wear protective equipment—a respirator in the case of material that can be breathed into your lungs; long sleeves with buttoned cuffs and collar if the material is dry and will irritate your skin; impervious gloves, apron, face shield, or goggles if the material is liquid and will irritate your skin and harm your eyes. Add a respirator if fumes or vapors from a liquid will harm your lungs or is toxic to your system.

There's nothing like paying attention and exercising care while at work. Many materials you handle in your work are finely divided particles, some very dusty (such as silica). When you must open and empty containers of these materials to use them, try to create as little dust as possible. You can't see asbestos fibers of the size that will harm you (about 5 microns in length). If you can see dust, you can bet the harmful sizes are there too. Treat other dusty materials the same way.

Wearing a head covering is a good practice. On a demolition or construction site you'll be wearing a hard hat. Your hair is a natural trap for any airborne particles.

# HEAT STRESS

Heat stress on the job can be a serious thing. Unless you can recognize the signs and symptoms of heat stress, you can fall victim to it.

Heat stress is a very complex product of numerous factors, each one affecting individuals in a slightly different way. The principal factors in heat stress are:

Environmental temperature
Humidity
Radiant heat
Work effort
Air movement

Our automatic internal regulators are pretty amazing! We're "geared" to operate with a normal body temperature of 98.6°F (oral). Our "core" or internal temperature is about 1.8 degrees higher. Anything that happens to change our core temperature triggers one or more defense mechanisms.

We perspire in relation to how hot it is. If it is also very humid, the perspiration doesn't evaporate rapidly enough to cool our skin surface and we perspire all the more.

Actually our first reaction to heat stress is that the heart starts pumping harder. More blood is diverted away from our internal organs to the skin surface to be cooled. This will reduce our internal temperature. Heavier breathing may begin at about the same time as the heart starts pumping harder.

If we are doing physical work, this process is speeded up because additional heat is being developed within our bodies. The automatic temperature control (you could call it our thermostat) is always trying to keep our internal temperature at 100.4°F.

What has been said here is really an oversimplification of the intricate biological functions. How physically fit a person is and whether or not he or she has become accustomed (acclimatized) to the heat exposure will determine that person's tolerance to heat.

It takes from 4 to 9 days to become acclimatized to a

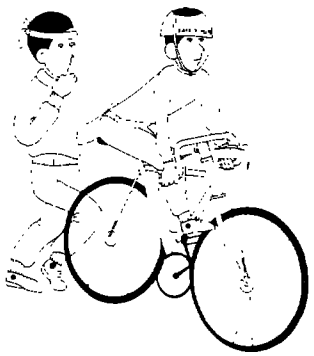
"hot job." If you're used to a "hot job" but have been away on vacation, you'll have to get acclimatized all over again. You never get "immune" to heat.

There are some side effects of heat exposure that must be reckoned with. In an exceptionally hot job, you may perspire as much as 20 to 25 pints of water a day. But water isn't the only thing you lose from your body; you also lose natural salts.

If you are in a hot job and perspire a lot, you should make it a practice to drink plenty of water, frequently—enough to replace the water lost. Some work places still provide salt in the form of tablets, readily available at the water fountain; others furnish lightly salted drinking water. If you use salt tablets, be sure they are dissolved in enough water. If your job is at an outside location, such as a demolition site, take plenty of lightly salted water to the work site with you (1/4 teaspoon per gallon of water will be about right, and you probably won't even taste it). After you get used to working in the heat, it is not necessary for you to use the salted water as much as before.

Insulation installers don't usually work in a constant environment. Therefore, you probably never get fully acclimatized to heat stress. You must acquaint yourself with the signs and symptoms resulting from exposure to heat and learn what to do about them.

You already know you should be in good physical condition if you work at a hot job and that you should replace water and salt losses.



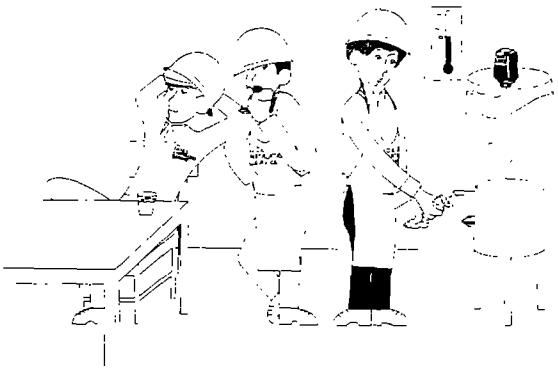
You certainly know when you are uncomfortably warm, and you know when you are thirsty. On top of that if you begin having muscle cramps, you should suspect inadequate salt in your system. These are sure signs you need to stop your physical efforts and seek a cool place to recover. These are some of the things which a person not yet acclimatized to heat stress may experience, but they can also happen to people who are fully acclimatized.

If your skin is clammy, your color flushed or blotchy, your breathing heavy, and if you have a feeling of mental confusion and a feeling of slight dizziness with difficulty focusing your eyes, look out! You're on your way to a heat stroke, or at least in trouble. Some of these symptoms may be absent and you could still be in trouble.

If you have symptoms of heat strain such as:

- skin pale and clammy OR warm, flushed, and moist
- skin dry, hot with absence of sweating
- weakness, dizziness, visual disturbances, headache
- nausea, vomiting, diarrhea
- muscle cramps
- breathlessness and palpitations (rapid heart beat)
- prickly sensations, red blister-like elevations on the skin

STOP whatever you're doing. Get to a cooler place. Ask for help if you feel you need it. Begin taking small but frequent drinks of water. Don't return to physical activity until you feel you are fully recovered. Even then be particularly alert to heat stress symptoms.



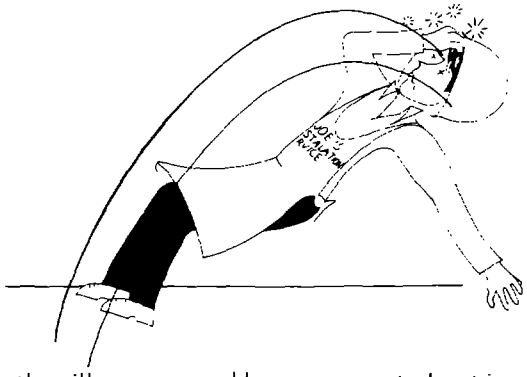
**During hot jobs drink small amounts, frequently.**

If you have heart trouble, high blood pressure, or other circulatory problems, seek medical advice about the use of salt in conjunction with doing hot work. Too much salt is not good for these health problems.

Learn to recognize heat strain signs and symptoms in others. You may be of valuable assistance to your fellow workers when you least expect it.

There are a number of heat-related illnesses, or symptoms which appear to be illnesses. One of them is dizziness. Fainting with disorientation caused by heat is called "syncope." The term encompasses a little more than that but—you get the idea.

- Be careful when stooping and lifting when you're hot.
- Don't stand still too long on hot jobs.
- Keep your blood flowing.



Another illness caused by exposure to heat is prickly heat. It manifests itself in a heat rash, which is caused by the need to perspire when the sweat glands are clogged up. Because the moisture and salt of perspiration cannot escape, a rash develops. Severe itching usually accompanies heat rash. Scratching irritates the rash and sometimes a skin infection develops.

The remedy, of course, is to avoid high temperature environments until the rash has disappeared. In severe cases, it may be necessary to see a doctor to treat infection.

Painful heat cramps (mentioned earlier) may not always occur on the job. You may experience cramps at home after work that are caused by the heat stress you experienced while at work.

Heat exhaustion is the term used to describe the most frequent type of heat disorder. The term isn't well defined and can mean anything from slight strain to just short of collapse. Generally, heat exhaustion means that a person has clammy skin, and an overall weak feeling of tiredness. This can be accompanied by dizziness, headache, and a pale appearance. Heat exhaustion usually means that the person isn't getting enough salt or water, or both. Rest in a cool place with water and salt intake, usually clears up heat exhaustion. If you see someone fainting or vomiting who has other signs of heat exhaustion, get him or her to medical attention right away.

The worst complication from heat stress is heat stroke. In heat stroke, the internal (core) body temperature rises drastically; more than your body's automatic mechanisms can cope with. Heat stroke can lead to death if not promptly and properly treated.

Heat stress happens when a person stops sweating (the body is protecting itself from excess water loss but is creating something even more serious). As heat stroke approaches, the skin will have a red and blue mottled appearance. The patient may have convulsions, mental confusion, and delirium from high fever. Internal body temperatures can go as high as 108°F. A person cannot stay at that temperature long without sustaining permanent damage—probably brain damage.

If you see someone you think has heat stroke, don't wait—

- Get them to a cool place.

- If their skin is dry, wet their clothes. It's OK to pour a bucket of water over their body.
- Cause air to circulate around them. Fan anyway you can.
- Send for medical help right away. Don't wait. Heat stroke develops into a life and death matter in minutes.


Heat stress causes other things, too. It causes your heart to work much harder in playing its part to cool your body. Since a larger portion of your blood supply is going to the skin surface to help cool your body, there is less of it available to nourish your muscles for work performance. All this makes you think that the work is harder to do. What's happening is that you tire faster. Forced physical effort in a heat stress condition is more likely to bring on a heart attack.

Hot working conditions also affect your mental attitude. It can make you irritable and mean; your emotions may "boil over" more quickly. (Keep this in mind when someone near you seems irritable for no apparent reason. You may know more about the cause than they do themselves.)

Heat stress even contributes to more accidents caused by body condition and attitude.

Heat and drugs don't mix! And that includes alcohol. Even aspirin will react differently in your system when you work at a hot job. If you are on medication, be sure to consult your own doctor or the company doctor about working in a heat stress environment.

Physical fitness has already been mentioned. But it bears repeating. Being physically fit doesn't mean being able to enter the Olympics. It means general well-being and that you get enough exercise to maintain good "muscle tone." Jogging and bicycling are ways to provide good muscle tone and to benefit heart and lung action as well.

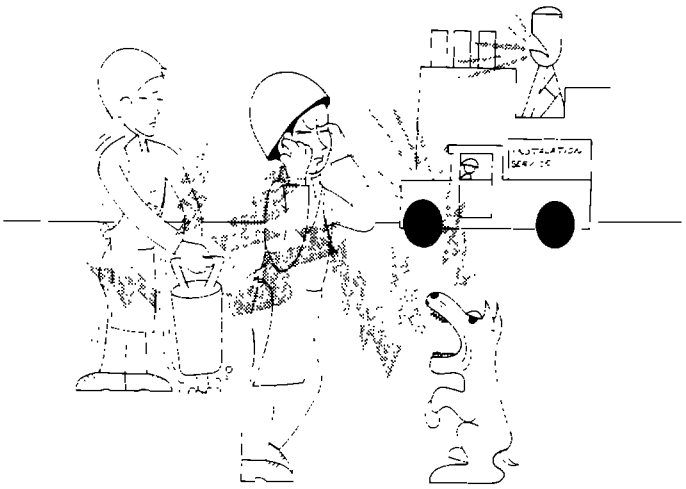
Reminders:

- Rest often on hot jobs (short breaks).
- Drink plenty of water.
- Replace salt lost by perspiring.
- Use fans, open windows, keep good air circulation in your work area.
- Keep physically fit.

# NOISE

Noise is a serious health problem in some industries. Noise can cause hearing loss that cannot be corrected by hearing aids, or even surgery.

If you have difficulty hearing and understanding normal speech at 3 feet distance from the speaker, you may already have acquired a hearing loss.

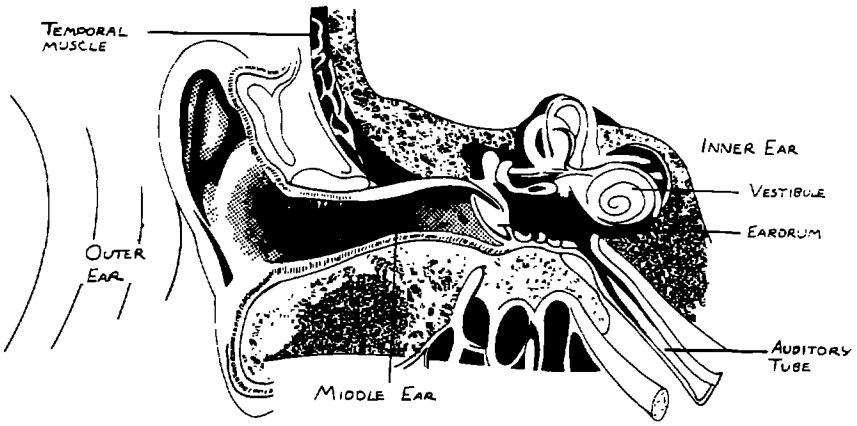


Noise is invisible pollution! When working near a noisy boiler, in a power plant, or at a punch press, the noise we hear we call "industrial noise." We can call it by whatever name we want to, but noise is noise.

Prolonged exposure to high noise levels is harmful to our ears. Another way to put it—it deteriorates our hearing ability. The sad part is that there is no cure for hearing loss caused by noise exposure.

There are very tiny sensory cells in our inner ear. These cells vibrate when sound waves reach our ear drums. The movement of the tiny cells causes electrochemical impulses to stimulate the auditory nerves that lead to our brain. The end result is we hear the sound.

Sound is energy. If your ears are assaulted by sound, day after day at a high enough level, it may finally destroy some of those tiny cells and cause a hearing loss. Which cells are destroyed will determine the frequency (pitch) at which the hearing loss occurs. The middle frequencies usually go first. Those are the frequencies most used in speech.




If you cannot hear and understand someone speaking in a normal (conversational) tone 3 feet away from you, the noise level is too high. If you're in a noisy area and you think you're getting used to it, think again! You don't get used to noise—your ears just aren't hearing as well as before.

Your employer must determine if employees are exposed to noise higher than prescribed by safety and health regulations. If the noise is too high, the regulations say he must reduce the noise level that is affecting the employee. This can be done in several ways: engineering controls, administrative controls, or personal protective equipment. (These controls are listed in their preferred order, but feasibility always enters the picture and alters our preferences.)

Where it is not feasible to reduce noise exposure except by personal protective equipment, your

employer must also initiate a hearing conservation program designed to measure the effectiveness of the protection he is providing. This includes audiometric testing to determine the employees' hearing ability and to detect any loss of hearing suffered by them. He must operate this hearing conservation program on a continuing basis as long as personal protective equipment is the control used to protect the workers.

Ordinary cotton stuffed in your ears will not provide the necessary protection against noise. Properly fitted ear plugs or ear muffs are designed for that purpose. Some ear protectors are designed to shut out the harmful noise (reduce it to an acceptable level) and still allow the wearer to hear people talking. When ear plugs or ear muffs are provided for your protection, wear them!

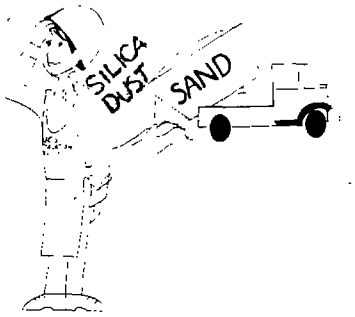
One important point—keep your ear plugs or ear muffs, whichever you use, clean and sanitary. Otherwise you may develop fungus in your ears which can lead to serious complications.

It isn't just the noise at work that can impair your hearing. That shooting you like to do on the skeet range can also deteriorate your hearing. What about that powered lawn mower you follow around on weekends? It can hurt you in more ways than one.

What to do? Obtain a pair of personal ear plugs or muffs! Protect yourself both on the job and off the job. No matter what caused it or where it was caused, hearing loss that was induced by noise cannot be regained.

# SILICA, OTHER IRRITANTS, AND FLAMMABLES

You should know that if you're working around sand (quartz), you're working around silica. Breathing silica dust can cause silicosis, a dangerous lung disease. Tuberculosis is often found in people who have silicosis. It is believed that silicosis weakens lung tissue in such a way that there is greater susceptibility to tuberculosis.




Naturally, you want to remain healthy. So, if you're exposed to the dust from sand (silica) on your job, you'll want to protect yourself from breathing it. Exhaust ventilation and wetting the material will give you some protection. Wearing a dust respirator suitable for silica dust is far better. Respirators using replaceable filter cartridges suitable for silica dust will have a dark grey stripe on the replaceable cartridge (canister).

In wearing a respirator to protect from any health hazard, the proper fit is as important as selecting the right respirator. The same comments in the section on asbestos about fitting and maintenance also apply here. Likewise, the comments about the ability to wear, and work in, a respirator also apply. Because of lung strength and vital capacity, not everyone can, or should work in a respirator.

You work with a lot of materials that are not immediately harmful but that may be irritating to your skin, nose, throat, and lungs with repeated and prolonged exposure. Skin irritants can make your skin break out or make you itch.

When your skin is irritated it is much easier to get an infection that might take you off the job. In any case, irritated skin will make you uncomfortable, if not incapacitated.

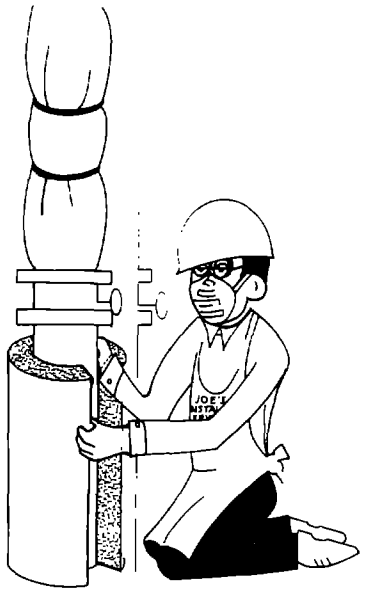
Fiberglass is one of the materials that can be highly irritating to your skin. It causes itching wherever it touches you. The tenderer the skin area, the more it will itch.

Wearing gloves, long sleeves, and a head covering will go a long way toward protecting you against fiberglass itch. Buttoning the sleeves and collar helps even more. The fibers from fiberglass can cut. If they get into your eyes, they can permanently scar your eyeball and possibly impair your vision. Wear goggles or face shield if there's a chance of getting the fibers in your eyes (like working above your head and looking up).

If you should notice a rash or boil-like reaction from fiberglass, seek medical advice for treating it. Make sure the doctor understands you handle fiberglass particles. The best protection against fiberglass particles is to not get it on your unprotected skin or in your eyes.

The tiny fibers from fiberglass break off and stick into your skin. You can't see them, but you know they are there because they hurt or itch. Rockwool fibers are even smaller than the ones from fiberglass. The smaller the fibers are, the more readily they can get into your skin.

Lay-in panels made of cellulose fiber can make you itch too. The panels "drop" tiny fibers when handled. These fibers, like the other fibers, cling to your skin. Body movement causes them to begin to penetrate. A moist skin is more susceptible to clinging fibers than dry skin.



These fibers are not toxic, but they certainly make you uncomfortable and the rash they cause can get infected. It's the possible end result of infections in the skin that is of most concern.

Some good work practices that will help prevent itching and irritated skin follow:

- When handling all materials that give off stiff or brittle fibers, wear the proper clothing: long sleeved shirts with buttoned collars and cuffs, gloves, and eye protection.
- Stay as clean and dry as possible. This helps to keep fibers from clinging to you and the cleanliness helps to keep down infection if your skin does become irritated.

- Wash with soap and water as often as possible to wash away fibers, and always at the end of the work day. (You can take fibers home with you just the same as mentioned under asbestos.)
- Don't wear those work clothes too many days. They will collect those fibers and contaminate your skin each time you put them on. Fibers have a way of working themselves through the garment to the inside.

Some of the adhesives and solvents used with insulation installing can be pretty rough on your skin.

- Follow the directions on the label.
- Don't get the material on your skin.
- Wash it off right away if you accidently get some on your skin.


Respiratory irritants are those which bother your nose, throat, and lungs. Some irritants make them itch and burn. Materials like dust and small fibers from glass or mineral wool can make your nose and throat sore. Also, dusts from other materials like vermiculite, perlite, and cellulose make you sneeze and cough.

- Either better general ventilation or local exhaust ventilation is needed.
- When ventilation cannot be improved to remedy the problem, the old standby—the respirator

must be used.

Some of the adhesives and solvents you use on the job are safe, made of watersoluble components. Some of them are flammable, even to the point of being explosive.

Before using any adhesive or solvent, read the label. If the label says it's flammable, don't use it around heat sources, sparks, or open flame. Don't smoke while you're using it either. Also, guard against breathing the fumes of any liquids which are volatile and give off fumes.

# LOOKING AT YOUR JOB

From time to time all of us need reminders about the potential hazards of our jobs. We become less aware of danger with repeated exposure.

When your supervisor or foreman reminds you of the "do's" and "don'ts" of your job, he isn't just exercising his delegated authority, he's sincerely looking out for your well-being. For your part—you can meet him at least half-way by doing those things that keep you and your fellow workers safe and healthy.

## *DUST*

Usually you can see it. Sometimes you can even smell it. But just because you don't see or smell it doesn't mean it isn't there. Where handling hazardous substances such as asbestos, either installing or removing, always assume that the dust and fibers of the hazardous material are there and take necessary precautions.

## *FUMES AND GASES*

You can usually smell the fumes given off by volatile liquids such as adhesives and solvents. Not all hazardous substances give notice; carbon monoxide is a colorless, odorless, tasteless gas. You must stay alert on the job.

## *NOISE*

If you can't hear another person talking in a conversational tone just 3 feet away; the noise level in your surroundings is probably too high. Or, you may have already lost part of your hearing ability. Hearing ability lost due to noise exposure cannot be restored, but the consequences of this loss can be reduced with surgery or a hearing aid.

## *HEAT*

Heat stress can be a serious health threat. Heat stroke can cause death. The factors involved are tem-

perature, humidity, work effort, and physical conditioning. Drink plenty of water to replace water loss and take salt to replace salt loss, both due to perspiring. Condition yourself to working in hot environments gradually. It takes from 4 to 9 days to acclimatize yourself. Even then, it is possible for you to be overcome by heat if you cannot remove heat from your body. A rise in the body's core temperature causes several things to happen. Perspiration begins, heart beat increases, blood flow to the skin increases, etc. If our inner temperature is not stabilized by these cooling mechanisms, ill effects begin taking place. Warning signs to do something are dizziness, nausea, and cramps. If proper action is not taken, prostration and total incapacitation may follow.

## *PROTECTION BY YOUR EMPLOYER*

Your employer is required to be aware of the job or jobs to be done to assess the possible dangers and protect employees against them. Your employer can provide this protection in several ways; by engineering controls, by administrative controls (which includes establishing work practices and procedures), and providing protective clothing and equipment.

Everyone faces some sort of hazard on the job. That's why sports players wear hard hats, face guards, protective padding, and so forth. You should protect yourself too. Where necessary, your employer should provide hard hats to protect your head from falling or flying objects; safety glasses, goggles, and face shields to protect from flying objects and splashes of harmful liquids; ear protectors, either plugs or muffs, to protect your hearing from noise exposure; respirators to protect your lungs from harmful dusts, fumes, gases, etc. Hand, body, and foot protection may also be needed in the form of gloves, special protective clothing, and safety foot wear. When you need this protective equipment, it's up to you to use it properly so that it provides you with the maximum protection possible. For example, if a respirator doesn't fit properly, you'll still breathe the harmful material and defeat the purpose of the respirator.

# FIRST AID AND MEDICAL CARE

One good way to stay healthy is to use any medical services provided by your employer. Report any symptom of problems you discover to your supervisor or company doctor (depending on your company's procedure). For example, don't let a skin rash or irritation go untreated. If certain job operations cause dizziness, chest pain, or other symptoms, report it. These symptoms may be a forewarning of serious problems.

Your employer must have individuals trained in first-aid available where there is no clinic or hospital in the immediate vicinity. These first-aid trained individuals must be present on each shift if your company works in shifts. If your company dispatches work crews away from the principal place of employment, a member of each work crew must have adequate first-aid training. Your employer must also keep records of illness and injury sustained by employees. Report any illness or injury no matter how minor.

If you work with asbestos, your employer will provide a number of physical examinations. You will be given a physical within 30 days of the day you start working with asbestos and within 30 days of the time you stop. Besides, you'll be given an examination at least annually while working with asbestos. These examinations will include X-rays and tests designed to measure your lung's working ability (called vital capacity tests). You'll also be asked about any symptoms you may have related to respiratory illness.

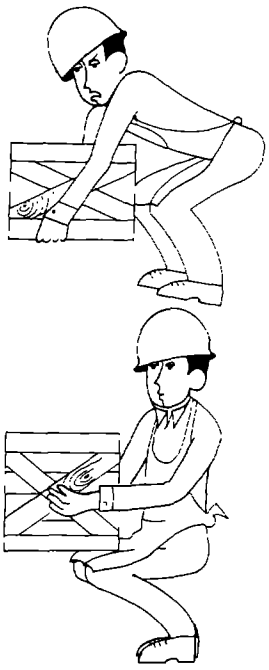
Your employer is required to keep records of these physical examinations. If you have been exposed to asbestos dust at work, your employer will keep these records on file for at least 20 years, even if you leave his employment. These records will be made available to you or your designated doctor at any time during your employment and for 20 years after.

# GOOD WORK PRACTICES

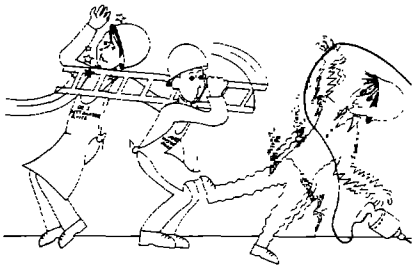
Your safety on the job requires thinking and the exercise of caution.

Properly maintained tools and equipment is an important factor in job safety. Take pride in the condition of your tools. Keep cutting tools sharp, keep electrical tools so that there is no shock hazard (replace frayed electrical cords and always see that the tool is grounded). If the tool or machine requires a guard, see that the guard is in place and adjusted.

Materials handling is one activity which causes more injuries on the job (all industries) than any other. That also holds true for insulation installers. Learn to lift properly using your leg muscles and not your back muscles. It isn't necessarily the weight of the object being lifted that causes muscle strain; awkward shapes and sizes can cause muscle strain too. Don't carry objects you can't see around or over.



Good housekeeping involves more than just cleanliness. It involves orderliness as well. And not just after the work shift is completed, but all during the work period. Tools and materials left for someone to stumble over, flammable materials left uncovered, open holes left unguarded or uncovered—these things can hurt you as well as your unsuspecting fellow worker. Make it a practice to keep the workplace orderly "as you go."



There are newer materials coming on the market all the time. Some of these are designed to replace older ones that were determined to be harmful. No doubt, your job will become safer as time goes on. All unsafe materials, however, can't be replaced. For some harmful materials, there are no acceptable substitutes, the individual worker will continue to need to increase his knowledge about working safely.

This Good Practices Manual has been prepared for you in the hope that it will give you some good pointers about your job. It is also hoped that you will be stimulated to take the initiative yourself. Know your job and the materials you work with. Get in the habit of reading the label on materials you use.

Wear the protective clothing and equipment provided you, and learn to adjust it for maximum protection. Report any injury or illness to your supervisor. Also, report those near misses, those occurrences which could have resulted in accidents, but didn't only because of chance. It may be possible to devise controls so that it will not happen again.

Many people depend on you! Your employer, your fellow employees, but most of all your family. Stay safe and healthy and don't let any of them down.



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