ASBESTOS AWARENESS PROGRAM

1.0 PURPOSE

The purpose of this program is to provide information about asbestos, the potential health effects associated with exposure, and safety procedures that should be followed to reduce exposure and protect the health of employees.

2.0 INTRODUCTION

The word asbestos is derived from a Greek word that means inextinguishable or indestructible. Asbestos is a naturally occurring mineral that is found throughout the world. Major deposits, however, are found primarily in the U.S., Canada, Russia, and S. Africa. Asbestos has several characteristics that make it desirable for many commercial uses. The fibers are extremely strong, flexible, and very resistant to heat, chemicals, and corrosion. Asbestos is also an excellent insulator, and the fibers can be spun, woven, bonded into other materials, or pressed to form paper products. For these reasons and because it is relatively inexpensive, asbestos has been widely used for many years and now is found in over three thousand different commercial products.

Exposure to asbestos fibers can cause serious health risks. The major risks from asbestos come from inhaling the fibers. Asbestos is composed of long silky fibers that contains hundreds of thousands of smaller fibers. These fibers can be subdivided further into microscopic filaments that will float in the air for several hours. Asbestos fibers can easily penetrate body tissues and cause disabling and fatal diseases after prolonged exposure.

Although exposure to asbestos is potentially hazardous, health risks can be minimized. In most cases the fibers are released only if the asbestos containing materials (ACM) is disturbed. Intact and undisturbed asbestos materials do not pose a health risk. The mere presence of asbestos does not mean that the health of occupants is endangered. When ACM is properly managed, release of fibers into the air is prevented or minimized, and the risk of asbestos related disease can be reduced to a negligible level. However, asbestos materials can become hazardous when they release fibers into the air due to damage, disturbance, or deterioration over time.

The ability to recognize the kinds of material that contain asbestos, knowing under what conditions they are dangerous, and understanding basic safety precautions, are all important in keeping exposures to a minimum.

3.0 TYPES

The term "asbestos" is a name that refers to six naturally occurring minerals. The three types most commonly used in buildings are chrysotile, amosite, and crocidolite. Chrysotile accounts for approximately 95% of the asbestos used in commercial products. Chrysotile is commonly called white asbestos because of its natural color. Amosite, known as brown asbestos, is the second most likely type found in buildings. It is hard to wet and therefore hard to control. Amosite is commonly found in boilers and pipes. The third type of asbestos is known as crocidolite. It is also know as blue asbestos or blue mud. Crocidolite is used in high temperature applications around pipes.

4.0 IDENTIFYING ASBESTOS

There are many substances that workers contact that may contain asbestos and have the potential to release fibers. Only rarely can asbestos in a product be determined from labeling or by consulting the manufacture. The presence of asbestos cannot be confirmed visually. The only way to positively identify asbestos is through laboratory analysis of samples. If the presence of asbestos is suspected always assume that it is an asbestos containing material and have it analyzed.

5.0 FRIABLE ASBESTOS

The potential for a product containing asbestos to release fibers depends on its degree of friability. Friable ACM can easily be crumbled or reduced to a powder by hand pressure, releasing fibers into the air.

The white fibrous or fluffy spray-applied asbestos material found in many buildings for fireproofing, insulating, sound proofing, or decorative purposes are friable. Friable ACM is found primarily in building areas not generally accessible to the public, such as boiler and machinery rooms. For example, asbestos insulation around pipes and boilers is considered friable.

Asbestos that is tightly bound with another material is considered non-friable and will only release fibers if sanded, cut, or broken. For example, ceiling tiles containing asbestos, and asbestos-cement pipe or sheets will not normally release fibers unless cut or broken. Vinyl asbestos tile is also considered non-friable and generally does not emit fibers unless sanded, cut, or sawed.

6.0 REGULATORY PROGRAMS

Both the EPA and OSHA control exposure to asbestos. EPA regulations are known as NESHAP (National Emission Standards for Hazardous Air Pollutants). These regulations specify control measures and work practices to reduce releases of asbestos into the environment. NESHAP regulations may require ACM removal before renovation and/or demolition projects to prevent significant asbestos releases into the air.

EPA has also implemented a separate regulation to handle asbestos materials used inside schools (grades K-12). This regulation is known as AHERA (Asbestos Hazards Emergency Response Act). The regulations require that all schools be inspected to determine the presence and quantity of asbestos. The type of corrective action such as removal, encapsulation, or maintenance in place is left up to the school.

OSHA regulations are designed to protect workers who handle ACM. OSHA has set standards for the number of fibers that a worker can be exposed to, called the permissible exposure limit (PEL). Current OSHA regulations have set a maximum workplace concentration limit of 0.1 f/cc measured as an 8-hour time-weighted-average. This is equivalent to approximately six fibers in a volume of air the size of a baseball. The time-weighted-average is calculated by dividing the total exposure for a workday by eight hours. Exposures over 0.1 f/cc are allowed as long as they are balanced by exposures under 0.1 f/cc. The standard includes requirements for respiratory protection, medical surveillance, and work practices to reduce indoor asbestos levels.

7.0 USES

Asbestos has been used for over three thousand years. There was very little use for asbestos until the start of the twentieth century when it was used as thermal insulation in steam engines. Since then it has been used in thousands of products. Consumption in the U.S. increased to a peak of 800,000 tons per year in the early 1970s. Because of health concerns, however, consumption has dropped by more than 70%.

Asbestos gained widespread use because it is plentiful, readily available, and low in cost. It has several properties that make it very desirable to industry such as fire resistance, high strength, poor heat and electric conductor, and resistance to chemicals. These properties have made it useful for electrical, acoustical, and thermal insulation and products that resist fire, friction, and chemicals.

Examples of these uses include automotive brake and clutch linings, floor and ceiling tiles, plastics, asbestos-cement pipes and sheets, paper products, textile products such as curtains and gloves, and insulation for boilers and pipes. It is also present in sprayed-on materials located on beams, in crawlspaces, and between walls. The amount of asbestos contained in these products may vary from 1-100%.

Fireproofing

One of the most common uses for asbestos was as a fireproofing material. More than half of the large multi-story buildings constructed during 1950-1970 period contain some form of sprayed ACM. It was sprayed on steel beams and columns to prevent these structures from warping or collapsing in case of a fire. Asbestos comprised 5-95% of the fireproofing mixture. This mixture is soft and fluffy in appearance and to the touch and is considered very friable. The material may vary in color from white to dark gray and may have been painted or encapsulated with a sealant. Spray painting of asbestos was banned in 1978.

Insulating and Decorative Purposes

Sprayed or trowelled asbestos coatings generally have an asbestos content of 50-80%. The coatings were commonly applied to steel I-beams and decks, concrete ceilings and walls, and hot water tanks and boilers. The coatings were applied primarily for thermal insulation but also provided acoustical insulation and a decorative finish. Sprayed coatings typically have a rough fluffy appearance. Trowelled coatings have a smooth finish and may be covered with a layer of plaster or other non-asbestos material. Both sprayed and trowelled coatings are friable. Asbestos insulation board was used as a thermal/fireproofing barrier in many types of walls, ceilings and ducts or pipe enclosures. This material looks like A-C sheets but is less dense and much more friable.

Pipe Insulation

Pipe insulation for hot and cold water and steam pipes commonly contained asbestos. These coverings have an asbestos content of about 50%. This material is usually white and chalky and was typically manufactured in 3-ft long half round sections. The sections were joined around the pipe using plaster soaked canvas or metal bands. Asbestos pipe coverings are easily crumbled and are considered friable.

Boilers and Hot Water Tanks

Asbestos block insulation was used as thermal insulation on boilers, hot water heaters and heat exchangers. These blocks are usually chalky white, 2 inches thick, and 1-3 ft long. The blocks are held in place by metal wires or lath and are often wrapped in a plaster-saturated canvas. The insulation is friable and readily deteriorates in a high humidity environment or when exposed to water.

Cement Pipes and Sheets

Asbestos cement was used to form pipes and sheets. Asbestos-cement pipes have been widely used for water and sewer lines. It was also used for electrical conduits, drainage pipes, and ventilation pipes. Asbestos-cement sheets have been used primarily for roofing and siding. It is also used in cooling towers, laboratory tables and hoods, and electrical switching gear panels. Asbestos-cement products are dense and rigid with gray

coloration. The asbestos in these products is tightly bound and does not release fibers to the air under normal use.

Building Materials

Asbestos is added to a variety of building materials to act as a binder and increase strength. It can often be found in concrete, concrete tile products, and plaster and may contain up to 50% asbestos by weight. These products are used in siding and roofing shingles, wall board, corrugated and flat sheets for roofing, cladding, partitions, and as pipes. Asbestos has also been added to asphalt, vinyl, and other materials to make products like roofing felts, exterior siding, floor tiles, joint compounds, and adhesives. Fibers in these products are usually firmly bound and are released if the material is mechanically damaged, for example by drilling, cutting, or sanding. Roofing shingles and siding may also show slow deterioration due to weathering.

Friction Products

Asbestos is used in brake and clutch linings on automobiles. In the past, asbestos linings accounted for up to 99% of the market. Although the asbestos is tightly bound, dust in a brake drum from worn linings contains high levels of asbestos. Non-asbestos brake linings have been developed and are replacing asbestos linings. Extreme care should be used when working on brake linings to ensure that the asbestos dust is properly contained.

Plastic Products

Asbestos was added to many plastic products for increased strength. For example, asbestos was added to vinyl and asphalt floor coverings, roof coatings, and some molded plastic products such as cooking pot handles. These products are usually tough and non-flexible. The asbestos is tightly bound and is not released under typical conditions of use. However, any sawing, drilling, or sanding may result in the release of fibers.

Paper and Textile Products

Asbestos fibers were also manufactured into many paper and textile products. Paper products containing asbestos include commercial insulating papers, gaskets, roofing materials, heat protecting mats and pads, filters, and tiles for walls and ceilings. Asbestos yarn is used to manufacturer fire resistant curtains, protective clothing, electrical insulation, thermal insulation, and packing seals. These materials may release fibers when cut or torn.

8.0 HEALTH HAZARDS

The increase in the use of asbestos resulted in a dramatic rise in asbestos related diseases among workers. At first, asbestos was not regarded as a health hazard because it has no taste or odor, often cannot be seen, and causes no immediate health effects. Health problems however, developed over time in exposed workers. It was not until the 1950s that asbestos received widespread attention as a potential health hazard. The diseases associated with asbestos did not appear for 20-40 years after the initial exposure, making it very difficult to confirm asbestos as the cause. However, overwhelming evidence now exists that exposure to airborne asbestos fibers is linked to several serious diseases.

Exposure to asbestos can cause disabling respiratory diseases and several types of cancer. The main routes of exposure are inhalation and ingestion. Asbestos fibers cannot penetrate the skin. Asbestos has been shown to cause asbestosis, lung cancer, mesothelioma, and cancer of the stomach and colon. The majority of people who died from asbestos exposure were exposed to very high concentrations of asbestos fibers at work and had little or no protection. These employees worked with asbestos regularly and for long periods of time. Examples include workers who held jobs in industries such as shipbuilding, mining, milling, and fabricating. Many of these workers were also smokers.

The most dangerous exposure to asbestos is from inhaling airborne fibers. The body's defenses can trap and expel many of the particles. However, as the level of asbestos fibers increase many fibers bypass these defenses and become embedded in the lungs. The fibers are not broken down by the body and can remain in body tissue indefinitely.

The Respiratory System

Since the primary health effects due to asbestos exposure are on the lungs, it is important to know how the respiratory system works. Air passes through the mouth and nose into the windpipe which splits into two smaller airways called the bronchi. The bronchi divide into smaller and smaller tubes which terminate into air sacs called alveoli. It is in these air sacs that oxygen is absorbed into small blood vessels and carbon dioxide passes out of the blood.

The lungs are surrounded by a thin membrane which looks like saran wrap. These membranes are very moist and slide easily across each other, but are difficult to pull apart. The linings are composed of cells known as mesothelia cells. Interaction of asbestos with these cells can result in a cancer called mesothelioma. If the linings are damaged, inhalation cannot occur properly.

The body has several mechanisms to filter the air we breathe. Large particles are trapped by the hairs in the nose. Smaller particles impact on the mucous coated walls of airway and are caught. The airway has hair-like linings (ciliated cells) which constantly beat upward. Dust particles caught in the mucous are swept upwards into the back of the mouth and swallowed. Cigarette smoking temporarily paralyzes these hair-like

projections preventing them from discharging the dust particles. This is one reason cigarette smokers who work with asbestos are at increased risk.

Particles reaching the tiny air sacs are engulfed by large cells called macrophages. However, because asbestos is a mineral fiber they are often unsuccessful. When this occurs the macrophages deposit a coating on the fiber and may form scar tissue around it.

Asbestosis

Asbestosis is a non-cancerous chronic respiratory disease caused by an accumulation of asbestos fibers in the lungs. The fibers cut the air sacs and cause scar tissue to form. Even after exposure to asbestos has stopped, scar tissue will continue to form around existing scar tissue and fibers in the lungs. The scarring reduces the capacity of the lung to take in air resulting in shortness of breath, coughing, and fatigue. As the disease worsens, shortness of breath occurs even at rest. In severe cases death may be caused by respiratory or cardiac failure.

Asbestosis is typically found in workers who have been exposed to large doses of asbestos over a long time. The greater the asbestos exposure the more likely asbestosis will develop. It may take 15-30 years for the disease to develop. Because the presence of asbestosis indicates that workers have been exposed to a large dose of asbestos, they are at greater risk for lung cancer.

Lung Cancer

Exposure to asbestos has been linked to an increased risk of lung cancer. Symptoms include a cough, chest pain, and blood-streaked sputum. The pain is usually felt as a persistent ache unrelated to the cough. Lung cancer has a latency period of 15-20 years. Exposure to asbestos and cigarette smoking combine to create a significantly higher risk of developing lung cancer than would be expected from each substance alone. A smoker exposed to asbestos may have 50-100 times the risk of developing lung cancer compared to a non-exposed non-smoker.

Mesothelioma

Mesothelioma is an extremely rare cancer of the thin membrane lining the chest and abdomen. Most incidences of mesothelioma have been traced directly to a history of asbestos exposure. Symptoms include shortness of breath, pain in the walls of the chest, or abdominal pain. Mesothelioma spreads very rapidly and is always fatal. It has a latency period of approximately 40 years. Mesothelioma is more likely to be found among workers who were first exposed to asbestos at an early age, such as in school.

Other Diseases

There are no known immediate effects associated with exposure to asbestos. There is no evidence that asbestos fibers can penetrate the skin. However, some workers have

experienced irritation and a rash from exposure. There is some evidence suggesting that swallowing asbestos fibers may cause cancers of the digestive tract and may be carried to other parts of the body after being absorbed into the bloodstream.

Risks Associated with Low-Level Exposure

Asbestos is a known hazard based on studies of asbestos workers and laboratory animals exposed to high doses. However, the risks associated with low level non-occupational exposure (e.g., an occupant of a building containing ACM) are not well established. Risks from low level exposure are based on extrapolation from workers exposed to high levels of asbestos and may not be reliable.

Based on a review of the literature EPA concludes that there is no safe or threshold level of exposure. Since asbestos fibers accumulate in the lungs, the risk of disease increases as exposure increases. Theoretically any exposure could result in an asbestos related disease. Although the risk at very low exposures may be negligible, measures to reduce exposure and the accumulation of fibers should be followed.

9.0 SAFE WORK PRACTICES- REDUCING EXPOSURE

Operations and Maintenance (O&M) Program

An Operation and Maintenance Program is designed to manage asbestos in place to safeguard the health of building occupants. This is accomplished by training, cleaning, work practices, and inspections to maintain ACM in good condition. Removal is often not the best course of action to reduce asbestos exposure. The O&M program is designed to prevent asbestos fiber release and control fiber releases if they occur. A well-run O&M program may be all that is necessary to control the release of fibers. Emphasizing the importance and effectiveness of a good O&M program is critical to putting the potential hazards of asbestos exposure in proper perspective. That effort centers on communicating the following five facts to employees:

1. Although asbestos is hazardous, the risk of asbestos-related disease depends upon exposure to airborne fibers. An individual must breathe asbestos fibers in order to develop an asbestos-related disease. How many fibers an individual must breathe are uncertain. However, at very low exposure levels, the risk may be negligible or zero.

2. The average airborne asbestos level in buildings is very low. Therefore, the health risk to most building occupants will be very low. An EPA study in 1987 found asbestos air levels in buildings to be essentially the same as levels outside. Based on that data, most building occupants (i.e., those unlikely to disturb ACM) appear to face only a very slight risk, if any, of developing an asbestos-related disease.

3. Removal is often not the best course of action to reduce asbestos exposure. In fact, improper removal can create a dangerous situation where none previously existed. Asbestos removals tend to elevate the airborne level of asbestos fibers in a building. Unless all safeguards are properly applied, a removal operation can actually increase rather than decrease the risk of asbestos related disease.

4. EPA only requires asbestos removal during building demolition or renovation activities. This is done to prevent significant public exposure to airborne fibers.

5. EPA recommends a proactive, in-place management program whenever ACM is discovered. In place management does not mean "do nothing." It means having a program that reduces the release of asbestos fibers, and ensures that proper controls and cleanup procedures are implemented if fibers are released. If in doubt about the possibility of disturbing ACM during maintenance activities, adequate precautions should be taken to minimize fiber release.

Basic O&M procedures to minimize and/or contain asbestos fibers may include wet methods, HEPA vacuuming, area isolation, PPE, and avoidance of certain activities, such as sawing, sanding, and drilling ACM. The need for these practices varies with the situation. For example, removing light fixtures located near ACM may disturb the material and might involve the use of special cleaning, area isolation, and respiratory protection. Periodic emptying of a trash can near asbestos containing plaster may not disturb the material, so special work practices would be unnecessary.

ACM may readily release fibers into the air when certain mechanical operations are performed directly on it. For example, fiber release can occur when workers are drilling, cutting, sanding, breaking, or sawing vinyl asbestos floor tile. Maintenance or repair operations involving those actions should be eliminated or carefully controlled to prevent or minimize asbestos fiber release. Certain activities that occur near ACM can also cause damage which may result in asbestos fiber release. For example, maintenance and custodial staff may damage ACM accidentally with broom handles, ladders, and fork-lifts while performing other tasks. Activities performed near ACM should always be done in a way that minimizes fiber release.

The O&M program should include a system to control all work that could disturb ACM. The person requesting the work should submit a Job Request Form to the Asbestos Manager before any maintenance work is begun that could disturb ACM.

Informing Building Occupants and Workers

Owners should inform occupants and workers about the location of ACM and stress the need to avoid disturbing the material. Occupants should be notified because they are less likely to disturb the material and cause fiber release.

In maintenance areas (such as boiler rooms and equipment rooms) signs should be placed directly next to boilers, pipes, and other equipment to remind maintenance workers not to

disturb the ACM. As an alternative, color coding can be used to identify ACM if all potentially exposed workers understand the coding system.

The information given to building occupants should contain the following points:

1. The location, condition of the ACM, and the appropriate response.

2. Asbestos only presents a health hazard when fibers become airborne and are inhaled. The mere presence of ACM does not present a health hazard.

3. Do not disturb the ACM.

4. Report any evidence of disturbance or damage of ACM to supervision.

5. Report any dust or debris that might come from the ACM or any changes in the condition of ACM to supervision.

6. Cleaning and maintenance personnel are taking special precautions to properly clean up any asbestos dust and to guard against disturbing ACM.

7. All ACM is inspected periodically and additional measures will be taken if needed to protect the health of building occupants.

General Safety Procedures

Everyone has probably been exposed to asbestos because it is so widely used. However, the health risks associated with asbestos are directly related to the amount and frequency of exposure. Decreasing exposure to asbestos will decrease the health risks associated with it. This can be done by following safe work practices and taking proper precautions.

The health risks associated with exposure to asbestos occur when it is disturbed and releases fibers into the air. To reduce exposure, it is important to know where asbestos is located and to minimize activities that will release fibers into the air. The potential for a particular form of asbestos to release fibers will depend on several factors including the degree of friability, wear, age, and location.

Exposure to asbestos fibers can be hazardous. The following general precautions will reduce exposure and lower the risk of asbestos related health problems:

1. Drilling, sawing, or using nails on asbestos materials can release asbestos fibers and should be avoided.

2. Floor tiles, ceiling tiles or adhesives that contain asbestos should never be sanded.

3. Use care not to damage asbestos when moving furniture, ladders, or any other object.

4. Know where asbestos is located in your work area. Use common sense when working around products that contain asbestos. Avoid touching or disturbing asbestos materials on walls, ceilings, pipes, ducts, or boilers.

5. All asbestos containing materials should be checked periodically for damage or deterioration. Report any damage, change in condition, or loose asbestos containing material to a supervisor.

6. All removal or repair work involving asbestos must be done by specially trained personnel. OSHA and EPA regulations are very specific about work practices and equipment required to work safely with asbestos. These requirements may include proper respirators, special enclosures, training, exposure monitoring, long term record keeping, and medical surveillance.

7. Asbestos should always be handled wet to help prevent fibers from being released. If asbestos is soaked with water or a mixture of water and liquid detergent before it is handled, the fibers are too heavy to remain suspended in the air.

8. In the presence of asbestos dust above the PEL, the use of a respirator approved for asbestos work is required. A dust mask is not acceptable because asbestos fibers will pass through it. The use of respirators must be approved by the Safety Office.

9. Dusting, sweeping, or vacuuming dry asbestos with a standard vacuum cleaner will put the fibers back into the air. A vacuum cleaner with a special high efficiency filter (HEPA) must be used to vacuum asbestos dust.

10. If a HEPA vacuum is not used cleanups must be done with a wet cloth or mop. The only exception to this would be if the moisture presents an additional hazard such as around electricity.

11. Asbestos waste, including all clean up materials, must be sealed in a double 6-mil plastic asbestos bag and properly labeled before being disposed in an EPA approved landfill.

Remember, the mere presence of asbestos itself does not create a health hazard unless the material is disturbed and releases fibers to the atmosphere. Protect yourself and others by being aware of where asbestos is located, the dangers involved, and using common sense when working around ACM.

Safety Procedures for Housekeepers

Housekeepers and maintenance workers may come into close proximity to ACM during the performance of their job duties. During routine activities exposure to custodians is very low and does not pose a significant risk for the development of asbestos related disease. A recent study determined that custodians who performed routine activities in

buildings that contained friable ACM were not exposed to airborne asbestos above the PEL.

If gradual deterioration or damage to ACM has occurred, asbestos-containing dust or debris could be present. Special cleaning practices should be used to collect residual asbestos dust. Routinely cleaning floors using wet methods is an example of one such practice. Custodial and maintenance workers should also identify and report areas that are in need of special cleaning or repair. Cleaning must be done properly because the use of improper techniques may result in widespread contamination, and increase air-borne asbestos fiber levels in the building. In addition, improper cleaning may cause damage to the ACM, thus releasing more airborne asbestos fibers.

Workers involved in cleaning up small quantities of asbestos dust must receive training in asbestos awareness. The following practices should be used:

1. Always use wet cleaning or wet-wiping practices to pick up asbestos fibers. Dry sweeping or dusting can result in asbestos fibers being re-suspended and should never be used.

2. Wet cloths, rags, or mops used to pick up asbestos fibers, should be properly disposed of as asbestos waste while still wet.

3. The use of special vacuum cleaners known as HEPA vacuums may be preferable to wet cleaning in certain situations. Never use a regular vacuum cleaner to clean up asbestos dust. Workers should wear proper PPE when changing HEPA filters. Waste must be disposed of as asbestos waste.

4. If ACM has been released onto a carpet it may be impossible to adequately clean the carpeted area. Consult with supervision prior to cleaning. Steam cleaning and HEPA vacuuming can be used. Proper respiratory protection may be necessary. This type of cleaning should be done after hours.

Asbestos Floor Tiles

The following procedures should be used when caring for asbestos containing floor tiles.

1. Sanding of asbestos containing floor tiles is prohibited.

2. Stripping of finishes shall be conducted using wet methods and low abrasion pads at speeds lower than 300 rpm. Do not perform dry stripping or overstrip the floor.

3. When high speed buffing is done, ensure that there is adequate sealer and finish on the floor. Always keep the machine moving.

4. Do not remove or attempt to repair loose floor tiles. Improperly removed asbestos containing floor tiles could result in the release of high levels of asbestos.

5. Report loose floor tiles to supervision immediately. Avoid running the machine over loose tiles.

Asbestos Fiber Releases

Special procedures are needed to reduce the spread of asbestos fibers after a release of fibers has occurred, such as the partial collapse of an ACM ceiling or wall. Depending on the severity of the release, an asbestos contractor may be needed to conduct the cleanup operation. If fibers are released through an incident, personnel should take the following steps to reduce asbestos exposure to occupants until trained asbestos personnel arrive:

1. Prevent access to the contaminated area if possible.

2. Shut and lock doors.

3. Report the damaged ACM to supervision.

4. Remain in the area to direct asbestos personnel to the site.

5. Do not attempt to clean up a release.

On occasion potentially large releases of asbestos fibers will occur. When this happens, supervision should be notified immediately. Supervision will notify the Asbestos Manager and the Safety Manager. They will conduct a joint evaluation of the release and determine what actions should be taken. A minor release episode is defined as three square or linear feet or less of friable ACM. A licensed asbestos contractor will be called to clean up releases greater than three square or linear feet. If the release is minor specially trained in-house personnel may clean-up the release using the following procedures:

1. Secure the area and post signs to prevent unauthorized personnel from entering the area.

2. If fibers could enter the HVAC system the unit should be shut down and sealed.

3. Put on a half or full face respirator with HEPA cartridges.

4. Put on a tyvek suit and gloves.

5. Clean up loose asbestos with a HEPA vacuum, do not use a regular vacuum.

6. If a HEPA vacuum is not available, wet down the area with amended water (water in which a few drops of liquid laundry detergent have been added).

7. Place all trash into two 6-mil plastic labeled bags.

8. Wipe the area clean.

9. Properly dispose of waste.

10.0 SUMMARY

The following key points should be remembered:

1. Inhalation of asbestos fibers can cause asbestosis, lung cancer, and mesothelioma. These health effects were noted primarily in workers exposed routinely to very high levels of asbestos on their jobs.

2. The health effects from exposure to low-level amounts of asbestos fibers are not as well understood. Therefore, custodial/maintenance workers should exercise caution when working around ACM and try to minimize exposures.

3. Three naturally occurring asbestos minerals, chrysotile, amosite, and crocidolite, are commonly used in building products.

4. Asbestos became a popular commercial product because of its strength, heat resistance, corrosion resistance, and thermal insulation properties.

5. ACM is regulated by EPA, OSHA, the Consumer Product Safety Commission, and individual state and local agencies.

6. Friable ACM can be found in about 700,000 public and commercial buildings. Many areas where asbestos is found are not accessible to the general public.

7. Some common uses of asbestos included pipe/boiler insulation, spray-applied fireproofing, floor and ceiling tile, and cement pipe/sheeting.

8. Positive identification of asbestos requires laboratory analysis. Information on labels or visual examination is not sufficient.

9. Intact, undisturbed materials generally do not pose a health risk. Asbestos may become hazardous when damaged, disturbed, or deteriorated over time and release fibers into the air.

10. If you smoke and work around asbestos your risks for developing asbestos related disease dramatically increase.

11. Report all releases and damaged ACM to supervision. Do not attempt to clean up asbestos spills.

12. Contractors are required to follow strict OSHA and EPA regulations when removing asbestos. Construction debris may be present after the contractor has left. This material will be free of asbestos.

13. Always consult the Asbestos Management Plan to determine where ACM is located in your work area.

11.0 ASBESTOS CHRONOLOGY

1879	First commercial production of asbestos containing insulation materials.
1899	First published case of lung scarring caused by asbestos.
1927	Term "Asbestosis" first used to describe lung scarring caused by asbestos.
1920's	More than 25 published articles concerning asbestos and lung disease.
1930	Greater than 25% of asbestos textile workers showed signs of asbestosis. First published article demonstrating that the greater the dose of asbestos exposure, the greater the likelihood of disease (dose/response).
1935	First published report in United States of workers suffering from both asbestosis and lung cancer.
1930's	More than 150 articles on asbestos related disease published in medical literature.
1942	Report of lung cancer in association with pulmonary asbestosis.
1943	Recognizes that industry may exert pressure in order to keep information on "industrial cancer" well under cover.
1943	Reports on pleural-based cancer (mesothelioma) in asbestos exposed patients.
1946	Found asbestosis occurring in end users of asbestos products (pipecoverers who had worked with insulation products in shipyards).
1949	Noting incidence of lung cancer in asbestosis patients was 13 times greater than in general population.
1953	Report of pleural mesothelioma in insulation worker who also had asbestosis.
1955	Incidence of lung cancer among asbestos textile workers found to be nearly 14 times greater than in general population.
1950's	More than 125 articles on asbestos and disease in the medical literature.
1964	Published results of largest study to date of asbestos exposed workers demonstrating excess deaths due to asbestosis.
1968	Demonstrates lung cancer incidence among smoking asbestos-exposed workers to be 50 times greater than in non-exposed population.