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|  | COMPANY HEALTH AND SAFETY PROGRAM | |
| | Document No. 8.12 | Date: August 15, 2006 |
| | Asbestos Abatement Standard Operating Procedure | Revision: 0 |

1.0 PURPOSE

The Asbestos Abatement Standard Operating Procedure (SOP) was instituted for personnel exposed to Asbestos Containing Building Materials (ACBM). The SOP assists personnel in conducting asbestos related activities ranging from handling ACBM, abatement, decontamination, air monitoring, and final cleanup.

2.0 SCOPE

HES does not as a regular part of its business perform ACBM abatement activities. This SOP applies to personnel involved with asbestos abatement activities for or on behalf of HES.

3.0 POLICY

It is the policy of HES to provide the necessary protection to personnel and follow the applicable requirements in accordance with 29 CFR 1926.1101 and EPA Guidance Manual for Controlling Asbestos-Containing Materials in Buildings (Purple Book).

4.0 RESPIRATORY AND PROTECTIVE CLOTHING REQUIREMENTS

Respirators will be provided to HES personnel as needed. Refer to the Respiratory Protection Program, Document No. 7.2 of the HES Company Health and Safety Program. Respirators and protective clothing must be used during the following types of work:

- Class I asbestos work.
- Class II asbestos work when ACM is not removed in a substantially intact state.
- Class II and III asbestos work that is not performed using wet methods, except for removal of ACM from sloped roofs when a negative-pressure assessment has been conducted and ACM is removed in an intact state.
- Class II and III asbestos work for which a negative exposure assessment has not been conducted.
- Class III asbestos work when TSI or surfacing ACM or PACM is being disturbed.

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- Class IV asbestos work performed within regulated areas where employees who are exposed above the TWA (0.1 fiber/cm³) or 30 minute excursion limit (1.0 fiber/cm³).
- Emergencies.

The appropriate respirator will be selected by a qualified HES representative using TABLE 1 from 29 CFR 1926.1101. HES will provide and require the use of protective clothing (e.g. TYVEK style coveralls or similar whole-body clothing, head coverings, gloves, and foot covering, at a minimum for personnel involved in any of the following situations:

1. An exposure at or above airborne concentrations of asbestos that exceed the TWA and/or excursion limit;
2. When a negative exposure assessment is not produced;
3. Or, for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet of TSI or surfacing ACM and PACM.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled accordingly. Clothing/work suits must be examined prior to donning for rips or tears. When rips or tears are detected while an employee is working the work suit will be immediately replaced and disposed of accordingly.

5.0 EXPOSURE ASSESSMENT AND MONITORING PROCEDURE

Qualified HES or subcontractor Industrial Hygiene Technicians have and will continue to conduct exposure monitoring in accordance with proper sampling procedure to accurately determine the airborne concentrations of asbestos fibers to which personnel may be exposed to in varying types of asbestos abatement activities.

Representative 8-hour TWA employee exposure will be determined on the basis of one or more samples representing full shift exposure for employees in each work area. Representative 30 minute short term employee exposures will be determined on the basis of one or more samples representing 30 minute exposure associated with operations that are most likely to produce exposures above the excursion limit for employees in each work area.

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An initial exposure assessment may be conducted immediately before or at the initiation of the operation to ascertain exposures during that operation. The assessment will be completed in time to comply with requirements directed by exposure data or the lack of a “negative exposure assessment,” and to provide information necessary to assure that all controls planned are appropriate for the operation.

Objective data from a negative pressure assessment will demonstrate that the product or material containing asbestos minerals or the activity involving such product or material conforms to the following criteria:

1. Cannot release airborne fibers in concentrations exceeding the TWA and excursion limit under those work conditions having the greatest potential for releasing asbestos; or
2. When prior monitoring from asbestos projects for the PEL and the excursion limit within 12 months of a current project and the data was obtained during work operations conducted under workplace conditions “closely resembling” the processes, type of controls, work practices, and environmental conditions used by similarly trained and experienced personnel; or
3. The results of the initial exposure monitoring of the current project from breathing zone air samples being representative of the 8-hour TWA and 30-minute exposures of each employee involved in the project which are most likely during the performance of the project to result in exposures over the PELs.

Periodic monitoring for Class I and II operations will be conducted daily, unless a negative pressure assessment for the project has been made. When exposures are expected to exceed a PEL, periodic monitoring of the work at intervals sufficient to document the validity of the exposure prediction shall be accomplished.

If the periodic monitoring reveals that employee exposures are below the permissible exposure limit and excursion limit, monitoring may be discontinued for the employee’s whose exposures are represented by the monitoring.

The monitoring results will be reported to the affected personnel as soon as possible following receipt of the monitoring results. Results may be posted at a designated location at the project if necessary.

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In addition to the breathing zone samples, monitoring may be conducted to demonstrate the integrity of the enclosure, the cleanliness of the clean room and shower area, and the effectiveness of the HEPA filter. If the clean room is determined to be contaminated, the room must be relocated to an uncontaminated area.

6.0 REMOVAL AND ENCAPSULATION PROCEDURES

Prior to removal of any ACM, it is first treated with a wetting agent, or amended water, to reduce the risk of fiber release during removal. The removal technique employed will differ based on the material and surface to which it has been affixed.

Friable Materials:

The gross removal area will be precleaned with wet cleaning methods and HEPA vacuums. All HVAC and electrical systems will be shut down, if possible. Critical barriers of 6 mil plastic will be installed over all openings to the work area. All furnishings in the work area that cannot be moved out of the work area will also be covered with 6 mil plastic. Containment barriers that employ the full range of worker protections are constructed prior to any removal. These barriers include (2) layers of 6 mil plastic installed on the walls and floors. Negative air machines will be installed to clean the air once every fifteen (15) minutes or less. The discharge duct will be exhausted to the exterior of the building unless otherwise approved by the regulating authority. Once the containment is completed, a three-stage decontamination chamber will be installed adjacent to the work area. The decontamination chamber will consist of a clean room, shower and dirty room. The decontamination chamber will be constructed with the same materials as the work area. The rooms will be separated by triple 'Z' flaps. The shower will be leakproof. The shower will have at least one shower head with hot and cold or warm water. Adequate quantities of soap and towels will also be provided. Shower will be filtered down to 5.0 microns in size before being discharged into the sanitary sewer. Workers will remove their respirator filters prior to exiting the shower.

Once removal commences, the material will be wetted continuously with amended water. The material will be cleaned up once a manageable amount has been removed. The material will be kept wet until it is placed into the bags or drums. Once a number of bags have been filled and sealed, the bags will be double bagged, labeled, and loaded out of the work area and placed into the dumpster for disposal.

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Once the removal is complete, the plastic sheeting and all equipment will be cleaned of visible debris by wet cleaning methods and/or HEPA vacuuming. We may also remove one layer of walls and/or floors and dispose of them instead of cleaning them. The plastic will be disposed of in the same manner as the asbestos material itself. The area will then be checked to ensure that no material has migrated behind any of the temporary barriers.

After the cleaning is completed, the area will be encapsulated with a color-tinted sealing material.

After the sealant has completely dried, the area will be cleaned again. All plastic except the critical barriers will be removed. The area will then be cleaned with wet cleaning methods and/or HEPA vacuuming.

Upon completion of the second cleaning, the third party air monitor will perform a visual inspection and clearance samples to determine if the area is sufficiently clean to tear down the remaining plastic. HES or subcontracted technicians will perform the required OSHA personnel air monitoring.

The use of a glovebag is commonly applied to projects where the amount of ACM removal is below EPA requirements or when no other means of containment are feasible. These glovebags are sealed to the pipe with tape. Pre-installed armholes are utilized to remove the insulation from the pipe. A sealed side port is also constructed on the glovebag to provide a means of continual wetting of the ACM as well as evacuation of the bag through the use of a HEPA-filtered vacuum. Glovebag procedures are conducted with the worker wearing a suit and respirator.

All other types of ACM that are too large and/or pose a puncture/tear risk will be wrapped in 6 mil polyethylene or placed in 6 mil polyethylene disposal bags inside of steel or plastic drums. The bags will be labeled as asbestos waste and stored in an on-site Asbestos dumpster or transported directly to a solid waste site.

Work procedures for enclosure projects are as follows:

- a twenty five (25) foot perimeter will be established with the use of asbestos danger tape
- warning signs will be posted at all entrances to the site
- criticals will be installed over all openings to the work area in all indoor projects
- pre-clean the area to be enclosed with a HEPA vacuum/wet cleaning methods
- install the closure in a manner to not disturb the ACM

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- properly label and demarcate the enclosure to warn building personnel in the event the enclosure needs to be disturbed

Work procedures for enclosure projects are as follows:

- a twenty five (25) foot perimeter will be established with the use of asbestos danger tape
- warning signs will be posted at all entrances to the site
- criticals will be installed over all openings to the work area in all indoor projects
- preclean the area to be enclosed with a HEPA vacuum/wet cleaning methods
- install the closure in a manner to not disturb the ACM
- properly label and demarcate the enclosure to warn building personnel in the event the enclosure needs to be disturbed

Work procedures for encapsulation projects are as follows:

- a twenty five (25) foot perimeter will be established with the use of asbestos danger tape
- warning signs will be posted at all entrances to the site
- criticals will be installed over all openings to the work area in all indoor projects
- preclean the area to be encapsulated with a HEPA vacuum/wet cleaning methods
- all HVAC and electrical systems will be shut down, if possible
- critical barriers of 6 mil plastic will be installed over all openings to the work area
- all furnishings in the work area that cannot be moved out of the work area will also be covered with 6 mil plastic
- (2) layers of 6 mil plastic on the walls and floors
- negative air machines will be installed to clean the air once every fifteen (15) minutes or less
- the discharge duct will be exhausted to the exterior of the building unless otherwise approved by the regulating authority
- a three stage decontamination chamber will be installed adjacent to the work area. The decontamination chamber will consist of a clean room, shower and dirty room. The decontamination chamber will be constructed with the same materials as the work area. The rooms will be separated by triple 'Z' flaps. The shower will be leakproof. The shower will have at least one shower head with hot and cold or warm water. Adequate quantities of soap and towels will also be provided. Shower will be filtered down to 5.0 microns in size before being discharged into the sanitary sewer.
- workers will remove their respirator filters prior to exiting the shower
- no encapsulant will be applied to sprayed on ACM or cementitious ACM or is damaged
- the encapsulant will have flame retardant characteristics

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- a test will be performed prior to the start of the project to ensure the encapsulant works to the manufacturers' specifications
- repair will be made to any damage that occurs as a result of the encapsulation process
- properly label and demarcate the enclosure to warn building personnel in the event the encapsulated material needs to be disturbed

Work Procedures for Dismantling Projects are as follows:

- a twenty five (25) foot perimeter will be established with the use of asbestos danger tape
- warning signs will be posted at all entrances to the site
- criticals will be installed over all openings to the work area in all indoor projects
- preclean the area to be encapsulated with a HEPA vacuum/wet cleaning methods
- all HVAC and electrical systems will be shut down, if possible
- install a glovebag at the cut point of the material to be dismantled (not necessary if dismantling material inside of a regulated asbestos work area)
- remove the exposed ACM using wet methods
- securely wrap the material to be dismantled in 2 layers of 6 mil plastic
- label and dispose of according to local, State, and Federal regulations

Work Procedures for Demolition Projects are as follows:

- a twenty five (25) foot perimeter will be established with the use of asbestos danger tape
- warning signs will be posted at all entrances to the site
- criticals will be installed over all openings to the work area with 6 mil plastic
- preclean the area to be encapsulated with a HEPA vacuum/wet cleaning methods
- all HVAC and electrical systems will be shut down, if possible
- triple flaps will be installed at the entrance to the work area
- negative air machines will be installed to filter the air once every 15 minutes
- a change room, shower room, and a clean room will be constructed
- the asbestos material will be removed by wet methods
- all visible residue and debris will be cleaned using wet methods and HEPA vacuuming
- upon completion of the project, the third party consultant will perform a visual inspection and clearance sampling

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7.0 ASBESTOS HANDLING PROCEDURES

Regardless of the measured levels of asbestos exposure or the results of the initial exposure assessment, if conducted, the following work practices and engineering controls will not be used for work involving ACBM or PACM:

1. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.
2. Compressed air used to remove asbestos, or ACBM, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by compressed air.
3. Dry sweeping, shoveling, or other dry clean-up of dust and debris containing ACBM or PACM.
4. Personnel rotation as a means of reducing personnel exposure to asbestos.

Where vacuuming methods are selected, HEPA filtered vacuuming equipment will be used. The equipment will be used and emptied in a manner that minimizes the reentry of asbestos into the working atmosphere.

Waste material with sharp points or corners must be placed in hard air-tight containers rather than bags.

Whenever possible, large components should be sealed in plastic sheeting and removed intact.

Once the ACM has been treated with a wetting agent and removed, it is then disposed of into leak-tight containers. These are typically 6 mil polyethylene bags. The other option is to use 55-gallon drums. Both types of containers are labeled, as specified by NESHAPS, OSHA and DOT.

8.0 SITE DECONTAMINATION PROCEDURES

Surfaces within the work area should be kept free of visible dust and debris to the extent feasible. Whenever visible dust appears on surfaces, the surfaces within the enclosure must be cleaned by wiping with a wet sponge, brush, or cloth and then vacuumed with a HEPA vacuum.

All surfaces within an enclosure should be cleaned before the negative air exhaust ventilation system is deactivated and the enclosure is disassembled when used.

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Personnel performing Class I asbestos projects involving over 25 linear or 10 square feet of TSI or surfacing ACM or PACM will have a decontamination area consisting of an equipment room, shower area, and clean room in series in accordance with 29 CFR 1926.1101(j)(1).

Personnel performing Class I work involving less than 25 linear or 10 square feet of TSI or surfacing ACM and PACM, and for Class II and Class III asbestos projects where exposures exceed a PEL or where there is no negative exposure assessment provided before the project will be in accordance with 29 CFR 1926.1101(j)(2).

Personnel performing Class IV work within a regulated area comply with the hygiene practice required of personnel performing work that has a higher classification within that regulated area.

9.0 FINAL CLEANUP PROCEDURES

No visible emissions are to be discharged to the outside air during the collection, processing, packaging, transporting, mixing, wetting operations, or deposition of any asbestos-containing waste material.

Vacuum bags or disposable paper filters should not be cleaned, but should be sprayed with a fine water mist and placed into a labeled waste container.

Process waste and housekeeping waste should be wetted with water or a mixture of water and surfactant prior to packaging in disposable containers.

The post-abatement cleanup includes wet mopping or HEPA-vacuuming of all horizontal and vertical surfaces in the work area. If a second cleaning after a 24-hour waiting period is necessary, then it is conducted.

10.0 RECORDKEEPING

Records for objective data demonstrating that ACM or PACM products are not capable of releasing fibers of asbestos in concentrations above the PEL and/or excursion limit under the expected conditions will be relied upon in support of the exemption and will include the following information:

1. The product qualifying for exemption;
2. The source of the objective data;
3. The testing protocol, results of testing, and/or analysis of the material for the release of asbestos;

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4. A description of the operation exempted and how the data support the exemption; and
5. Other data relevant to the operations, materials, or processing.

Exposure measurement records taken to monitor personnel exposure to asbestos will include the following information:

1. The date of measurement;
2. The operation involving exposure to asbestos that is being monitored;
3. Sampling and analytical methods used and evidence of accuracy;
4. Number, duration, and results of samples collected;
5. Type of protective devices worn, if any; and
6. Name, social security number, and exposure of the personnel whose exposures are represented.

Personnel exposure assessment records will be maintained for a period of thirty (30) years.