



Department of the Air Force
HQ AEDC (AFMC)
Arnold AFB, TN 37389

Safety, Health, and Environmental Standard

Title: ASBESTOS

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Releasability: There are no releasability restrictions on this publication.

The provisions and requirements of this standard are mandatory for use by all personnel engaged in work tasks necessary to fulfill the AEDC mission. Please contact your safety, industrial health and/or environmental representative for clarification or questions regarding this standard.

Approved:

Contractor /ATA Director
Safety, Health and Environmental

Air Force Functional Chief

Record of Review/Revision

(Current revisions are highlighted in yellow and marked with a vertical line in the right margin.)

Date/POC	Description
04/10/14 B Sizemore MB. Bragg	Three year review: Administrative changes - Changed "SHG" and "Environmental" to "SHE," and "Operating Contractor" to "Base Operating Contractor" throughout. This required renumbering of Section 4.9 and the remaining sections through 4.12 which had been separated into separate sections: Safety and Health Group; Environmental. Incorporated role of AEDC/TSD-SG in 4.1.1, 4.9.10, and 4.11.2. Added definition for "HEPA vacuum cleaner;" expanded definitions of "wet methods" and "wetting agent." Provided example of "small scale" job in 4.1.1. Clarified role of Base Operating Contractor SHE in 4.1.1.2 and 4.1.1.3. Clarified requirements for "accredited asbestos inspector" in 4.1.3.4. Expanded sections 4.1.4 and 4.2 to address upcoming labeling and signage requirements which become effective in 2105 and 2016. Clarified use of "frequently" in 4.1.4. Expanded 4.6.1.3 to include requirement for lining dumpsters (roll-offs), trucks, trailers, enclosed trucks and other vehicles used for asbestos disposal and ensuring proper labeling and sealing to prevent water intrusion when used to store or transport asbestos materials to the AEDC landfill. Clarified disposal requirements in 4.6.3. Added HEPA-filtered to 4.8.12. Expanded 4.8.17.1 to include review of manufacturers' instructions prior to use of HEPA vacuums. Clarified need for supervisors to notify SHE upon discovery of damaged asbestos-containing materials. Deleted "randomly" in 4.9.1. Changed notification requirement for employee air monitoring results from fifteen to five working days in 4.9.7.
03/11/2013	Added NFAC supplement; no other change.
02/12/11 B Sizemore// MB Bragg/	Two-year review; added Tennessee Asbestos Accreditation requirements; added requirement to label ACM abandoned in-place and note on drawings; added requirement to use GC-1622 Asbestos Landfill Form; changed notification timeline of monitoring results from 5 to 15 days to match OSHA 1910.1001
03/12/09 M B Bragg	Annual review, minor insignificant grammatical corrections and clarifications; no change to existing processes.
02/20/08	Annual review; no change required.
03/03/07	Annual review; no change required.
02/21/06 R Amacher	Reviewed: Date change, Definitions - Minor wording corrections, 4.1.1.2 added: or in an email that provides the equivalent information, 4.1.1.3 added: from past sampling, 4.9.1 added: Asbestos materials shall not be used unless non-asbestos substitutes are not commercially available, 4.9.3 added: or sends a detailed email with the same information as the GC-1624 to the Safety and Health Group. 4.13.2 Added: and approval has been granted from contractor industrial hygiene. Annex A Class I – added: and maintained certification by attending an annual 8 hour refresher course. Also added: greater than 25 linear feet or 10 square feet, Annex A- 21. Added: following asbestos removal, collapse the bag by removing air, with the vacuum from the bag. Annex A Class IV – 2. added: Carefully inspect the work area to ensure all asbestos has been removed from all surfaces, cracks, etc.
1 August 2003	Reformatted to COI changes
November 2003 MB Bragg	Reformatted to new COI changes and to address changes due to contract change



Safety, Health, and Environmental Standard

ASBESTOS

1.0 INTRODUCTION/SCOPE/APPLICABILITY

- 1.1 Introduction – This standard provides requirements and responsibilities for procurement, use, handling, and disposal of asbestos and materials containing asbestos for the **Base** Operating Contractors and the Air Force at Arnold Air Force Base.
- 1.2 Introduction – This standard is intended to implement State, Federal, and Air Force asbestos regulations.
- 1.3 Applicability – This standard is applicable to all personnel involved in or procurement, use, handling, and disposal of asbestos and materials containing asbestos at Arnold AFB. AEDC locations outside Tennessee shall comply with appropriate regulations for their locale.

2.0 BASIC HAZARDS/HUMAN FACTORS

The primary health hazard of asbestos results from the inhalation of asbestos fibers. Exposure to asbestos fibers can result in lung diseases such as asbestosis, lung cancer, and mesothelioma.

3.0 DEFINITIONS

Asbestos-Containing Material (ACM) – Any material that contains greater than one percent (1%) asbestos by weight is considered to be asbestos containing. (OSHA definition)

Asbestos Operations Manager (AOM) – Manages the facility asbestos operation plan, use of the in-house asbestos work force, and the periodic surveillance and re-inspection of facilities.

Asbestos Program Officer (APO) – A member of the AEDC/TSDSG staff who oversees the facility asbestos management plan and acts as the focal point of contact between the Air Force, contractors, and the Tennessee Department of Environment and Conservation (TDEC) concerning asbestos related issues.

Asbestos Survey – A basewide survey to identify the locations of asbestos on the base. Surveys were conducted during FYs 88, 89, 93 and 94. The survey is updated on a continual basis. Also includes surveys to identify asbestos for maintenance activities and to verify asbestos locations during facility renovations or demolitions.

Base Operating Contractor – A base contractor directly accountable to the Air Force for the AEDC mission.

Competent Individual – A person trained in all aspects of asbestos abatement, the contents of OSHA 1926.1101, the identification of asbestos, asbestos removal procedures, and other practices for reducing the hazard. Such training must be obtained in a comprehensive course.

Excursion Level – Any 30-minute period within the normal 8-hour workday, during which the asbestos employee is potentially exposed to the maximum risk.

Facility Asbestos Management Plan – The management plan that provides the documentation for all asbestos management efforts and the mechanisms for overseeing the entire facility asbestos management program.

Facility Asbestos Operation Plan – This plan describes how Arnold AFB carries out its asbestos-related projects. It assigns responsibilities, establishes inspection and repair teams, and gives repair procedures and personnel protection instructions. This AEDC Safety, Health, and Environmental Standard (E7) is part of this plan.

Friable Asbestos – Materials containing more than one percent (1%) asbestos by weight that can be crumbled, pulverized, or reduced to powder by hand pressure when dry (EPA definition).

HEPA Vacuum Cleaner- a special industrial vacuum cleaner designed for and equipped with a High Efficiency Particulate Air filter. This is the only type vacuum cleaner allowed for use for asbestos, lead or other hazardous material cleanups.

Local Exhaust Ventilation – Control of airborne contaminants at their point of generation to prevent their release within the workplace.

Outside Contractor/Subcontractor – An organization employed by a contractor or the Air Force to do construction, maintenance, repair or other work at AEDC. There is no employment relationship, control or supervision of the subcontractor's employees by AEDC contractors. Also referred to as the construction contractor. In some instances,

outside service contractors may also be contracted to serve on an on-call basis and are referred to as on-call service contractors.

Permissible Exposure Limit (PEL) – Refers to an 8-hour time-weighted air concentration of asbestos fibers to which workers may not be exposed without respiratory protection. The current OSHA PEL is 0.1 fiber per cubic centimeter of air.

Properly Trained Asbestos Worker – A worker of any craft or trade who has received training in asbestos abatement methods as described in OSHA 1926.1101, and who has received an annual asbestos medical examination and respirator training. An asbestos worker must be medically fit to wear respiratory protection; AEDC asbestos workers are respirator fit-tested by **Base** Operating Contractor Safety, Health, and **Environmental** annually. An asbestos worker must not have any facial hair that prevents a proper seal between the face and the respirator. Training also includes the use of high-efficiency particulate air filtered (HEPA) vacuum cleaners. Training may consist of four levels depending on the type of work that the employee may conduct. Training may consist of Class 1, 2, 3 or 4 level training. Class 1 training consists of an initial 32-hour or 40-hour worker or supervisor course and annual 8-hour refresher training. Class 2 training may also consist of an initial 32/40-hour course for general Class 2 abatement or 4 to 8-hour specialty training for particular Class 2 applications. Annual refresher training for Class 2 may range from a 2-hour to 8-hour training course. Class 3 work requires a 16-hour initial course with a 4-hour annual refresher course. Class 4 work requires 2-hour annual training. For additional information, see Annex A of this standard.

Wet Methods/Adequately Wet – Soaking or wetting to saturation to control the generation of airborne fibers. Water mixed with a wetting agent should be used. **Soaking or wetting to saturation to control the generation of airborne fibers is also known as adequately wetting.**

Wetting Agent – A commercially available material which, when added to water, allows water to be more easily absorbed into asbestos. It makes water “wetter.” This is typically a surfactant such as “non-suds” liquid soap. **When a wetting agent is added to water it is commonly referred to as amended water.**

4.0 Requirements/Responsibilities

4.1. General

4.1.1 Operations that involve a potential release of airborne asbestos fibers shall require written procedures or job safety analysis (JSA), which shall be reviewed by **Base** Operating Contractor Safety, Health and **Environmental** (SHE). This includes emergency maintenance and repair operations that can be reasonably anticipated, such as pipe and valve repair. Only properly trained asbestos workers shall perform any work involving asbestos.

Procedures for jobs of a small scale and routine nature **such as the removal of one glove bag of asbestos or a small cleanup of debris (one disposal bag full), repair of a small area of damaged insulation or removal of a gasket may** be written in a generic manner and used as general guidance for other similar jobs.

4.1.1.1 Asbestos work procedures outline necessary precautions that shall be taken during all phases of the asbestos work. The procedure shall be prepared by the supervisor of the job or, in the case of an outside contractor, by the outside contractor. The written procedure or job safety analysis (JSA) shall outline the appropriate measures to be taken to control exposure to airborne asbestos fibers in accordance with OSHA, EPA, and TDEC rules and regulations. **SHE** shall provide assistance as necessary in the development of **Base** Operating Contractor procedures; outside contractor plans must be approved by **SHE** and **AEDC/TSD-SG**. See Annex A, Rules and Regulations, and Annex B, Equipment Checklist for general procedure information.

4.1.1.2 The Tennessee Department of Environment and Conservation must be notified of removal or demolition of asbestos-containing materials. SHE shall be contacted by the requesting organization at least 30 days before such work so State authorities can be notified. The requesting organization shall provide information to **SHE** using Form GC-1508, Intent to Remove Asbestos, or via email that provides the same information. **From this information, SHE must generate and send a notice letter to the State after coordination and signature by the AF/TSD/SG.**

4.1.1.3 **SHE** shall also be contacted by the requesting organization before any job involving asbestos is begun so that air sampling may be conducted and other aspects of the job evaluated as required by OSHA and EPA. The requesting organization shall report the location of any abatement (i.e., removal, repair, cleanup) giving

the quantity to be removed and any sample numbers indicated on the asbestos to be removed and identified from past sampling to allow verification of asbestos identification and to allow update of survey information found in the SHE records.

4.1.2 The following shall be prohibited unless approved by SHE:

- Incorporation of asbestos materials in new designs (see Para. 4.6.3).
- Procurement of asbestos materials (see Para. 4.6.3).
- Establishing or maintaining stocks of asbestos materials.
- Any use of friable asbestos.

4.1.3 All replacement insulation shall be non-asbestos material.

4.1.3.1 For identification, the word NONASBESTOS shall be stenciled at the edges of replaced sections using a highly visible paint. Arrows shall indicate the direction of replacement, and a three-inch stripe shall indicate the boundaries. Stencils for Base Operating Contractor use may be obtained from the Operations and Maintenance Paint Shop; labels obtained from supply stock with the wording ASBESTOS-FREE may also be used.



4.1.3.2 The word NONASBESTOS shall also be placed at intervals not exceeding 25 feet.

4.1.3.3 Letter size for use on pipe insulation shall conform to the following:

<u>Outside Diameter of Pipe Covering</u> (inches)	<u>Minimum Height of Letters</u> (inches)
Less than 3/4	1/4
3/4 to 1 1/4	1/2
1 1/2 to 2	3/4
2 1/2 to 6	1 1/4
Over 6	2

4.1.3.4 Unidentified, or unlabeled materials such as pipe insulation, gaskets, valve packing, floor tile, mastics, wallboard, sheet rock mud or spackling compounds, etc. shall be assumed to be asbestos until proven otherwise. Labeling as in Paragraphs 4.1.3.1 - 4.1.3.3 above, historical work records, and laboratory analyses shall be used to identify asbestos materials. Sampling and identification shall only be done by properly trained asbestos inspectors. The decision to treat as asbestos or non-asbestos shall be based on sample results as collected by accredited SHE asbestos inspectors and shall be based on guidelines set out by EPA and OSHA. Contact SHE for identification of the materials and guidance in their proper handling. An accredited asbestos inspector, worker, designer, or supervisor are individuals that have completed the initial or annual refresher courses; submitted papers and fees to the State and received a pictured accreditation card from the State. This is an annual requirement and must be current when work is performed.

4.1.4 Any newly identified asbestos-containing materials, shall be labeled as follows:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

Any existing stocks of labels with the old wording will be accepted. Any new orders shall use the wording above. If the existing stocks are not depleted by the June 1, 2015 deadline, then these cannot be used and labels with the new wording shall be used.

NOTE: Existing labels are acceptable until current stock is depleted. Any newly purchased signs will use the above wording. Labels already in place on asbestos-containing materials need not be removed. Replace such labels when damaged.

- 4.1.5 Asbestos-containing materials abandoned in place during renovation work shall be clearly labeled and properly identified on drawings. When possible, asbestos materials should not be abandoned in place.

4.2 Restricted Areas

Entry to the areas where asbestos-containing dust may be generated and controlled shall be restricted with ropes, barriers, and/or polyethylene enclosures posted with 20- by 14-inch signs bearing the following warning:

DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY
WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA.

NOTE: Existing signs are acceptable until current stock is depleted. Any newly purchased signs will use the above wording.

4.3 Personal Protection

The protective measures outlined in OSHA Standard 1926.1101 shall be used for maintenance and repair operations that may generate airborne asbestos. Contact SHE for guidance. Machining or fabrications of asbestos-containing materials, or work on vehicles shall be conducted in accordance with the OSHA General Industry Standard for Asbestos 29 CFR1910.1001.

4.4 Housekeeping and Material Control

- 4.4.1 Areas where asbestos-containing materials may accumulate on surfaces shall be cleaned frequently to prevent accumulation. Frequently is often enough to ensure that asbestos does not accumulate on surfaces so that it may be seen by the naked eye or at levels that will result in re-entrainment of the asbestos. Surfaces, floors, machines, and other items contaminated with asbestos dust shall be wet-cleaned with rags, mops, or sponges or a vacuum cleaner equipped with a HEPA filter. Rags, mops, or sponges used for asbestos cleanup shall be disposed of as asbestos waste. Areas where asbestos-containing materials will be removed or damaged shall be isolated. Floors shall be covered with two layers of 6-mil polyethylene or three layers of 4-mil polyethylene and walls shall be covered with two layers of 4-mil polyethylene. Ceilings shall be covered as appropriate.
- 4.4.2 Areas where asbestos-containing materials are located shall be inspected frequently to determine if new damage to such material has occurred resulting in the exposure of friable asbestos. Damaged asbestos shall be repaired using approved methods such as bridging encapsulant, insulation cloth, aluminum jackets, etc. Duct tape may be used as a temporary sealing method as long as tape integrity can be maintained. Visible friable asbestos shall be cleaned up or contained as soon as possible. If areas are too damaged or contaminated to repair or clean up with available resources, warning signs and barriers shall be placed around the areas to isolate the friable asbestos and appropriate action shall be taken to prevent additional damage, contamination, and exposure to workers. Local ventilation shall be shut off when necessary. Upon securing the area, contact SHE. Repair of damaged insulation shall be conducted by Class 1, 2 or 3 trained workers. The cleanup of contaminated areas shall be done by employees trained in asbestos abatement using the proper equipment or by the Base Asbestos On-Call Service Contractor. If a small area of debris is involved, cleanup may be done by any Class 1, 2, 3 or 4 level trained workers.
- 4.4.3 If the use of asbestos materials is approved, material-containing asbestos shall remain in its original packaging. This material shall be issued only in packaged form. After needed portions of asbestos materials are cut from bulk supplies (using proper asbestos control methods), unused portions shall be tightly sealed in double layers of 6-mil plastic for storage, returned to the package while in the warehouse, or transferred to other organizational units. Improperly sealed asbestos materials shall not be accepted for storage at the warehouse or by other organizational units. The use of friable asbestos shall be prohibited.
- 4.4.4 Any package containing asbestos material shall be labeled as indicated in Section 4.1.4 above.

4.5 High Efficiency Particulate Air (HEPA) Filtered Vacuum Cleaners

To facilitate the care and use of HEPA filtered vacuums, Form GC-82, Safety Information (Tag) shall be affixed to each vacuum indicating the date of the last HEPA filter change, date of each use, and the number of hours used. The last replacement date of internal bags or filters also shall be indicated.

4.6 Waste Disposal

4.6.1 Asbestos-contaminated material, scrap, and waste asbestos shall be sealed in an asbestos disposal bag and placed in another disposal bag (combined thickness of plastic must be at least 12 mil). The outer bag must be labeled as indicated in Section 4.1.4 above.

4.6.1.1 Water used in wet-method control and cleaning shall be captured, placed in impermeable containers, labeled as above, and treated as asbestos waste. Large quantities of water contaminated with asbestos shall be filtered through a 1-micron water filter and discharged into a sanitary sewer. Large quantities of asbestos waste (except containers of liquid waste, which must be filtered) may be put directly into the asbestos landfill provided containers are sealed and labeled as above. After asbestos-containing material has been properly containerized and labeled by the removing organization, a responsible person from that organization shall submit a work request via the Work and Asset Management system (WAM) to arrange for pickup by Base Operating Contractor Roads and Grounds (R&G). This effort shall be coordinated with SHE.

NOTE: R&G shall not pick up asbestos materials unless the asbestos materials have been properly containerized, adequately wetted, and labeled. Form GC-1622, AEDC Asbestos Landfill Operators and Shippers Log, shall be completed in triplicate by the requester for each load of asbestos provided to R&G at the time of asbestos pickup.

4.6.1.2 R&G shall only pick up asbestos waste generated by the Base Operating Contractor. Asbestos removed by any outside contractor shall be handled and directly disposed of in the AEDC Asbestos Landfill by outside contractor personnel. Outside contract monitors shall submit a WAM work request to arrange for landfill support and proper burial in the landfill and shall coordinate this effort with SHE. Only properly containerized, labeled, and adequately wetted asbestos shall be transported to or disposed of in the asbestos landfill. This requirement shall be made a part of the contract specifications. Outside contract monitors shall take the necessary measures to plan and coordinate the disposal effort with SHE, and R&G, and the outside contractor removing the asbestos to ensure timely burial in the asbestos landfill.

4.6.1.3 AEDC personnel who remove asbestos shall be responsible for proper containerization and labeling of asbestos containers. AEDC personnel who remove asbestos shall be responsible for asbestos until R&G has picked up the material. Small quantities of bagged asbestos may be placed in a rigid, secure container until pickup is arranged.

The rigid container shall be properly labeled as required in Paragraph 4.6.1. Large quantities of bagged or plasticized asbestos may be left within the asbestos removal area or other restricted area provided roping and labeling have been accomplished as required in Paragraph 4.6.1; floors are lined with polyethylene, and the area is protected from the weather.

In the event that water or other materials leak out of the storage vehicle, dumpster (roll-off box), trailer, enclosed truck or other such vehicle or storage location unto the vehicle, ground or floor underneath, the materials including water shall be treated as asbestos and cleaned immediately including contaminated soil or gravel and disposed of in properly labeled containers and taken to the AEDC Asbestos Landfill for disposal. To avoid such a leak and reduce the amount of cleanup to the vehicle, etc. it is recommended as a best practice of the asbestos removal industry to cover the walls and ceilings where applicable of dumpsters (roll-offs), trucks, trailers, enclosed trucks and other vehicles with two layers of 4 mil polyethylene sheeting. The floors are lined with two layers of 6 mil or three layers of 4 mil polyethylene sheeting to reach a total of 12 mils. The lower layers of polyethylene sheeting are sealed to the walls with a third layer of 4 or 6 mil polyethylene sheeting placed in such a manner so that it may be replaced without damage to the other floor or wall layers. If leaking materials contaminate the floor, the upper floor layer may be replaced as necessary between loads of materials to prevent contamination of the truck, etc. and prevent complete re-lining of the dumpster, truck or trailer. This will reduce the risk of contamination of the vehicle or area thus reducing the amount of cleaning to the area in the event of a leak from a disposal bag or other container or bundle of asbestos containing materials.

- 4.6.2 The AEDC Asbestos Landfill shall be the ONLY SITE approved for asbestos disposal at AEDC. Disposal of asbestos in any area other than this landfill is prohibited. All materials taken to the AEDC Landfill shall be documented on form GC-1622, AEDC Asbestos Landfill Operators and Shippers Log.
- 4.6.3 Materials that are considered hazardous waste as defined by the EPA shall not be disposed of in any AEDC landfill including the Asbestos Landfill. If asbestos materials are contaminated with a hazardous material making it a hazardous waste, then the asbestos and hazardous materials shall be disposed of as a mixed hazardous waste as determined by SHE. This type of material shall not be disposed of in the Asbestos Landfill. Hazardous waste shall be properly drummed, labeled, and disposed of as hazardous waste in accordance with AEDC Safety, Health, and Environmental Standard E18, Chemical and Petroleum Products Waste Management. Under no circumstances shall any free liquids be placed into either landfill at AEDC. This includes materials that are dripping wet and mud that is pumpable. This means mud that has too much water in it allowing it to flow. This pumpable mud or similar material will allow the liquid to leach out of the material once it is placed in the landfill and therefore not allowed.

4.7 Disasters and Other Incidents Damaging Asbestos Materials

- 4.7.1 In the event of disasters or emergencies involving insulated equipment or buildings, such as fires, explosions, and high winds, emergency response and cleanup personnel shall take special precautions to prevent exposure to airborne asbestos generated by these events.
- 4.7.2 Following any disaster, efforts shall be made to identify asbestos-containing materials in the disaster area and take appropriate action to prevent exposure and ensure proper disposal of asbestos-containing material.
- 4.7.3 Whenever asbestos materials are damaged through a disaster or other event, SHE shall be notified.

4.8 Base Operating Contractor Organizational Unit Shall

- 4.8.1 Ensure that asbestos materials are not incorporated into new designs without written approval of SHE. Asbestos materials shall not be used unless non-asbestos substitutes are not commercially available.
- 4.8.2 Route procurement requests for asbestos materials and requests for services for asbestos removal through SHE for written approval before routing to Base Operating Contractor Supply.
- 4.8.3 Consult SHE for identification of asbestos-containing materials. Report sample numbers from the base survey found on insulation before removal to allow for update of the asbestos survey information found in the SHE records and to assist in the verification of asbestos identifications. These numbers must be reported to SHE. Complete Form GC-1625, Asbestos Abatement Tracking Form, or send a detailed email with the same information as the GC-1625 to SHE.
- 4.8.4 Route all project designs, work requests, and work plans involving asbestos through SHE for review.
- 4.8.5 Prepare a written procedure outlining necessary precautions before starting any job that involves asbestos. (A procedure for any predicted emergency repair work shall be developed and available for use by repair personnel.) Contact SHE before start of job. (SHE provides assistance in the development of written procedures or JSA/JSR and should be contacted in time to allow the development of procedures without the delay of the required work.)
- NOTE:** Example specifications for use on jobs involving outside contractors may be obtained from SHE or Engineering.
- 4.8.6 Ensure work done by outside contractors is consistent with this standard and is in compliance with State and Federal regulations. A Base Operating Contractor or Air Force representative shall monitor the work to ensure compliance with the approved work plan.
- NOTE:** Air Force and Base Operating Contractor Project Monitors/Managers shall ensure that outside contractors submit work plans to SHE for approval before asbestos removal.
- 4.8.7 Inform employees who work with asbestos of its hazards, control methods, and the applicable parts of this standard. SHE may assist. (See Annexes A and B for additional information.)
- 4.8.8 Accept only properly packaged and sealed materials containing asbestos from the warehouse.

- 4.8.9 Cut asbestos material required for a job from bulk supplies (when necessary) using proper asbestos control methods and return unused portions to the warehouse, storage area, or other organizational unit in tightly sealed, double-layered plastic and labeled as indicated in Section 4.5.
- 4.8.10 Ensure drawings and sketches that specify the use of asbestos material contain the following information:
- CAUTION: Contains ASBESTOS
Special Processing Instruction Required
- 4.8.11 As renovation of areas occurs, update building drawings, etc., to reflect the current status of asbestos-containing materials in renovated areas. Send a copy of this information to **SHE** to allow update of the Asbestos Database Management Plan.
- 4.8.12 Provide respiratory protection and **HEPA-filtered** local exhaust ventilation. Use wet methods and other methods required by OSHA and EPA regulations during asbestos jobs. Ensure that employees involved in asbestos work receive respirator fit tests annually.
- 4.8.13 Restrict access to asbestos work areas and post sign at all approaches in accordance with the warning found in Section 4.2. Restriction of areas may include the enclosing of the work area with polyethylene walls. If this is necessary, floors are covered with two layers of 6-mil polyethylene and walls are covered with two layers of 4-mil polyethylene to contain asbestos contamination. Ceilings are also covered with polyethylene when necessary.
- 4.8.14 Immediately seal damaged insulation suspected to be asbestos. (Taping is acceptable until permanent repairs can be made as long as the integrity of the tape is maintained.)
- 4.8.15 Utilize disposable coveralls, booties, and head covers during work involving asbestos. Treat contaminated coveralls, etc., as asbestos.
- 4.8.16 Treat asbestos-contaminated materials as outlined in Section 4.6.
- 4.8.17 Ensure that employees working with asbestos receive **any required** asbestos physicals, asbestos worker training, respirator training, and fit testing before conducting any asbestos work.
- 4.8.17.1 Ensure that workers using HEPA vacuums are properly trained in the care and use of such equipment. **This should be accomplished by reviewing manufacturers' operation and cleaning instructions by workers prior to use of the HEPA vacuums.**
- 4.8.17.2 Closely monitor all asbestos jobs conducted by AEDC or outside contractor personnel as appropriate. Monitor outside contractors before, during and following asbestos removal to ensure that all work plans; safety, health and environmental concerns; and conditions of the contract are strictly followed.
- 4.8.17.3 Conduct continual surveillance or re-inspections of work areas to identify changed asbestos conditions and submit appropriate work requests or projects to abate asbestos damage. **Notify SHE immediately upon discovery of damaged materials.**
- 4.8.17.4 Contact **SHE** for guidance and assistance in the determining the locations of asbestos-containing materials and the proper method of abatement.
- 4.9 Base Operating Contractor Safety, Health, and Environmental Shall**
- 4.9.1 Inspect asbestos landfill to ensure compliance with TDEC landfill regulations.
- 4.9.2 Monitor asbestos work to ensure that concentrations of asbestos fibers are at acceptable levels and that OSHA regulations are being followed.
- 4.9.3 Approve the use of asbestos materials when it is established that substitutes cannot be found and that their use is necessary.
- 4.9.4 Review written procedures, JSAs, and work plans for asbestos work.
- 4.9.5 Provide general guidance to organizational units involved in asbestos work.
- 4.9.6 Conduct air sampling to determine employee exposure to asbestos.

- 4.9.7 Send written notification through appropriate management channels to employees who have been monitored for exposure to asbestos fibers. This notification shall occur not later than **five working** days following the receipt of the results.
- 4.9.8 Provide training of asbestos workers as required in OSHA 1926.1101. Training shall include the use of respirators, HEPA vacuums, and other related information concerning asbestos removal policies and procedures conducted at AEDC. (See Section 5.0.)
- 4.9.9 Ensure that air pollution standards are met and notify the Tennessee Air Pollution Control Board Technical Secretary as required by State environmental regulations.
- 4.9.10 Assign **with the coordination of AEDC/TSD-SG**, Risk Assessment Codes (RACs) to damaged ACM as appropriate per Safety, Health and Environmental Standard A5, Hazard Reporting Program.

4.10 Base Operating Contractor Dispensary Shall

- 4.10.1 Provide pre-assignment, periodic and termination physical examinations for employees whose work may involve exposure to asbestos above the action level.
- 4.10.2 Provide employees **who previously worked on asbestos abatement projects at AEDC and** who are no longer working on asbestos abatement projects with an **asbestos** physical examination every five years.

4.11 Base Operating Contractor Supply Shall

- 4.11.1 Not procure, stock, or issue asbestos material without the approval of **SHE**.
- 4.11.2 Not accept shipments of asbestos material from outside AEDC or from any AEDC organizational unit unless the materials are properly packaged and sealed and approval has been granted by **SHE and AF/TSD/SG**.

4.12 Base Operating Contractor Roads and Grounds (R&G) Shall

- 4.12.1 Dispose of asbestos and asbestos-contaminated material in accordance with Section 4.6.
- 4.12.2 Maintain asbestos landfill records and site map to document locations of disposed asbestos.

5.0 BASE OPERATING CONTRACTOR TRAINING

- 5.1 **SHE** or persons who have been designated by **SHE** to provide the training shall conduct asbestos training for **Base Operating Contractor personnel**. Training may consist of four levels of training, depending upon the type of work that the employee may conduct. There are four levels of training, which are defined as Class 1, 2, 3 or 4. Class 1 training consists of a 32-hour or 40-hour worker or supervisor course and annual 8-hour refresher training. Class 1 initial training shall be conducted by an outside provider either on base or at an off-site location.
- 5.2 Refresher training shall be conducted once a year by a provider meeting special OSHA, EPA, and TDEC qualifications. Class 2 training may also consist of the 32/40-hour course for general Class 2 abatement or 8-hour specialty training for particular Class 2 applications. Annual refresher training for Class 2 may range from a 2-hour to 8-hour training course. Class 3 work requires a 16-hour course with a 4-hour annual refresher course. Some highly specialized work such as work with asbestos-insulated electrical wiring may only require a 4-hour initial class with a 2-hour annual refresher training. Class 4 work requires 2-hour annual training.
NOTE: Training may be provided by **SHE** or outside vendor as appropriate.
- 5.3 TDEC requires all persons conducting asbestos related activities in the State of Tennessee to be accredited/licensed. This requirement applies to the following disciplines: Asbestos Worker, Supervisor, Inspector, Project Monitor, Management Planner, and Project Designer.
 - 5.3.1 **SHE** shall coordinate the acquisition and maintenance of accreditations/licenses for all AEDC contractor employees.
 - 5.3.2 Outside contractors shall provide evidence of training and copies of TDEC accreditations/licenses through submittal packages prior to conducting asbestos related activities at AEDC. Accreditations must be current throughout the length of the contract.

6.0 REFERENCES

AEDC Asbestos Management and Operating Plan
AEDC Safety Standard B3, Control of Hazardous Areas
AEDC Safety, Health, and Environmental Standard A5, Hazard Reporting Program
AEDC Safety, Health, and Environmental Standard E18, Chemical and Petroleum Waste Management
AEDC Safety, Health, and Environmental Standard F4, Respiratory Protection
AFI 32-1052, Facility Asbestos Management
Federal Resource Conservation and Recovery Act, 1976 (PL 94-500)
OSHA 29 CFR 1910.1001, Toxic and Hazardous Substances, Asbestos
OSHA 29 CFR 1926.1101, Toxic and Hazardous Substances, Asbestos
Tennessee Air Pollution Control Regulations 1200-3-11
Tennessee Solid Waste Disposal Act

7.0 ANNEXES

Annex A Summary of OSHA Rules and Regulations with Application and Procedures for AEDC
Annex B Equipment Checklist

8.0 SUPPLEMENT

NFAC A321-0801-XSP E7 Asbestos

ANNEX A

SUMMARY OF OSHA RULES AND REGULATIONS WITH APPLICATION AND PROCEDURES FOR AEDC

(Also follow other instructions found in the main body of this SHE Standard.)

In 1995 OSHA completed a major revision to the OSHA asbestos standard for the construction industry. With this revision, the old asbestos standard 29 CFR 1926.58 was renumbered and rewritten. The new standard is now 29 CFR 1926.1101 Asbestos. The portions of the standard significant to the small operations performed by in-house employees are summarized below. The entire standard is available for review by going to <http://www.osha.gov>.

The permissible exposure level (PEL) is 0.1 fiber per cubic centimeter of air.

Asbestos work has been grouped into four classifications. Each class has its own requirements with requirements of some classes overlapping. Each classification is summarized below:

Class I:

This class includes all asbestos activities that involve the removal of thermal system insulation and surfacing asbestos-containing materials (ACM) and presumed asbestos containing materials (PACM). This includes removal of pipe insulation in quantities greater than one standard glove bag. For work involving Class I, a competent asbestos supervisor shall closely supervise asbestos work. All aspects of the work shall be supervised to ensure full compliance with the OSHA standard. The competent supervisor is a supervisor that has received 40 hours of asbestos training from an approved asbestos course and maintained certification by attending an annual 8-hour refresher course.

For any Class I work conducted for quantities greater than 25 linear or 10 square feet of thermal system insulation or surfacing material the following shall be performed: [Due to the strict requirements for this removal, work greater than 25 linear feet or 10 square feet shall be performed by the AEDC On-Call Service Contractor for asbestos].

1. Notify **Base** Operating Contractor Safety, Health and **Environmental (SHE)** so that proper notification may be made to the Tennessee Department of Environment and Conservation (TDEC) and so that air monitoring may be conducted.
2. Warning signs and ribbons that demarcate the regulated area shall be placed on the perimeter of the work area to prevent unauthorized entry into the asbestos work area.
3. Critical barriers or another approved isolation method shall be used to prevent migration of airborne asbestos from the regulated area.
4. HVAC systems shall be isolated in the regulated area by sealing with a double layer of 6 mil plastic or the equivalent. (This is not required outdoors, unless work is being conducted close to a fresh air intake).
5. Impermeable drop cloths shall be placed on surfaces beneath all removal activity.
6. All objects within the regulated area shall be covered with impermeable drop cloths or plastic sheeting which is secured by duct tape or an equivalent.
7. Work shall be conducted within a HEPA ventilated regulated enclosure maintaining negative pressure of -0.02 inches of water and 4 air changes per hour; or with a glove bag.
8. The enclosure shall be attached to a decontamination area that consists of an equipment room, shower area, and clean room in series. The shower shall be equipped with hot and cold running potable water. When glove bagging is conducted, the shower and decontamination area shall be placed at the edge of the regulated area where the general glove bagging is taking place.

General Glove Bag Removal Procedures:

These procedures apply to Class I, Class II or III glove bag operations regardless of the quantities of asbestos to be removed.

1. Notify **SHE** so that air monitoring may be conducted and proper notification made to TDEC.
2. Glove bags shall be made of 6-mil thick plastic and shall be seamless at the bottom.
3. Glove bags used on elbows and other connections must be designed for that purpose and used without modifications.
4. Each glove bag shall be installed so that it completely covers the circumference of pipe or other structure where the work is to be done.

5. Glove bags shall be smoke-tested for leaks prior to use.
6. Glove bags shall not be used on surfaces whose temperature exceeds 150 degrees F.
7. Prior to disposal, glove bags shall be collapsed by removing air within them using a HEPA vacuum.
8. At least two persons shall perform Class I glove bag removal operations.
9. Place polyethylene under the work area.
10. Wear full body protection (e.g. coveralls, booties, head covers, and gloves) in addition to respiratory protection.
11. Turn off ventilation systems located in the area during asbestos removal.
12. Clean-up debris and seal ventilation openings in the area.
13. Establish critical barriers by sealing doors and windows or wall penetrations as necessary.
14. Do not allow asbestos insulation to drop to the floor or ground.
15. Ensure that the diameter of the pipe insulation does not exceed one-third of the bag's working length.
16. Ensure that the glove bag is sealed by conducting a smoke test. A smoke test is conducted by inserting a smoke tube used in ventilation system analysis through the bag. If smoke leaves the bag, then the seal is inadequate, before removal work continues an adequate seal shall be achieved. Retest the glove bag after each failure.
17. Wrap any damaged pipe insulation, adjacent to the work area or capable of creating asbestos fallout as a result of glove bagging, in at least true 6-mil thick plastic sheeting and seal tight with duct tape, or seal and repair with insulation mastic and canvas. In areas where insulation to be removed is in deteriorated condition and the temporary repair may create a potential fiber release, use HEPA local exhaust ventilation during its repair or removal.
18. Saturate all asbestos-containing materials within the glove bag with amended water prior to stripping. When using pump-up sprayers for wetting agents and encapsulants, place the spray wand through the side of the bag and seal holes prior to the start of asbestos removal.
19. Saturate the pipe with amended water after the insulation has been stripped and scrub with a brush to remove all visible asbestos material.
20. Seal any piping insulation ends created by the repair or removal with an encapsulant and an insulation mastic.
21. Use a HEPA vacuum to collapse the glove bag. Seal the vacuum hose into the glove bag prior to asbestos removal following asbestos removal, collapse the bag by removing air from the bag with the vacuum.
22. Double-bag the glove bag and all other asbestos-containing waste for disposal.

Pipes or valves too large for glove bagging shall be removed by use of a HEPA filtered and exhausted enclosure. In this case, the work shall be performed by the AEDC OCSC for asbestos through subcontract.

Class II:

Class II asbestos work includes activities involving the removal of asbestos containing material which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics. Basic procedures for the removal or handling of Class II asbestos are:

General conditions:

1. Notify **SHE** so that air monitoring and proper notification may be made to TDEC.
2. A competent asbestos supervisor must supervise all Class II work.
3. Place warning ribbons and signs to demarcate the asbestos work area.
4. Place critical barriers over all openings to the regulated area.
5. Verify that the barrier works properly and place impermeable drop cloths on all surfaces beneath removal activities.
6. Workers shall wear respirators, full body coveralls including head cover, booties and gloves.
7. Remove materials using wet methods and other methods suitable for Class II work.

8. Clean all debris from the area.
9. Bag and arrange for disposal in the asbestos landfill.
10. Conduct personal decontamination procedures.

In addition, the following methods may be used for certain materials as described below:

Vinyl or asphalt flooring (including linoleum flooring)

1. Follow 1-10 under general conditions.
2. Do not sand flooring or its backing.
3. Do not rip up resilient sheeting.
4. Do not dry sweep.
5. Do not use mechanical chipping unless performed in a negative-pressure enclosure.
6. Use vacuums equipped with HEPA filters to clean floors.
7. Use wet methods when removing resilient sheeting by cutting.
8. Use wet methods to scrape residual adhesives and/or backing.
9. Removal tiles intact, unless impossible.
10. If heating tiles and removing intact, wetting may be omitted.
11. Assume resilient flooring material including mastic and backing is asbestos containing.

Roofing materials:

1. Follow requirements set out in 1-10 of general conditions.
2. Remove intact.
3. Use wet methods.
4. Continuously mist cutting machines during use unless the competent person determines that misting causes a safety hazard.
5. Immediately HEPA vacuum all loose dust along the cut.
6. Bag or polyethylene wrap materials as soon as possible after cutting and remove from the top of the building by the end of the work shift.
7. Isolate roof level heating and ventilation air intake sources and shut down the ventilation. If the ventilation cannot be shut down, contact Industrial Hygiene for guidance and possible waiver.

Cementitious asbestos-containing materials such siding, shingles, transite panels, or pipes:

1. Follow 1-10 under general conditions.
2. Do not cut, abrade, or break siding, shingles, or transite panels unless doing so in mini-containment equipped with HEPA exhaust or unless using a method which uses HEPA exhausted tools. Cutting, drilling or sanding with electrically or pneumatically powered tools are prohibited.
3. Spray asbestos with water or amended water and carefully remove the material as intact as possible.
4. If pipes are small diameter, they may be removed by placing a wet cloth around the pipe and using a chain breaker to cut the pipe. If a chain break is not available, then break the pipe with hammer by hitting the pipe through the wet cloth.
5. Bag or wrap in 6 mil polyethylene following removal.
6. Label as asbestos.

Sheet Rock, Joint and Spackling Compounds

These materials shall be removed as Class I asbestos unless SHE grants written approval to perform the work as Class II. Contact SHE for guidance for abatement procedures of these materials. See 1-10 of general conditions above.

Gaskets and Packing Materials

1. If the gasket or packing material can be removed intact, remove and dispose of as asbestos. If the material is visibly deteriorated and unlikely to be removed intact, follow 1-10 under general conditions

and remove the gasket within a glove bag as described under Class I work. If the gasket is too large for glove bagging, then remove as indicated below.

2. Place 6 mil polyethylene under work area to catch any material that might be dropped during packing removal.
3. Wet saturate the gasket or packing material. Scrape the gasket and remove using a HEPA vacuum to catch any small pieces of asbestos as they are being removed. HEPA vacuum debris from surfaces and dispose of as asbestos.

Class III

Class III asbestos work means repair and maintenance operations where asbestos containing materials including thermal system insulation and surfacing material is likely to be disturbed. Glove bag operations of one glove bag or less are considered Class III work.

Class III asbestos work shall be conducted using engineering and work practice controls which minimize the exposure to employees performing the asbestos work and to bystander employees.

General conditions for Class III asbestos work:

Follow 1-10 under general conditions found in Class II work.

Class IV

Class IV asbestos work means maintenance and custodial activities during which employees contact, but do not disturb asbestos containing materials and activities to clean up dust, waste and debris resulting from Class I, II, and III activities, or activities required to eliminate asbestos hazards associated with aging, weathering, and mishaps. Procedures vary with degree of contamination, but generally follow the basic procedure described below.

1. Follow 1-10 under general conditions found in Class II above.
2. Vacuum loose asbestos with a HEPA vacuum cleaner and wet wipe all surfaces and dispose of cleaning rags, etc. as asbestos waste. Carefully inspect the work area to ensure all asbestos has been removed from all surfaces, cracks, etc.

Contact **SHE** for other information concerning Class IV work.

References: 29 CFR 1926.1101

ANNEX B
EQUIPMENT CHECKLIST

The following equipment/materials are required for glove bag asbestos removals. Take these materials to all glove bag removals (stock numbers may not be current):

- Respirators and Type H particulate cartridges (the type for which you have been fit-tested).
- Coveralls with booties and head covers:
Stock No. X Large 8415-01-115-8404, XX Large 8415POO0824.
- Cotton or Nitrile gloves (to be worn during setup and by person not working inside glove bag):
- Cotton gloves Large 8415LOO17092804.
- Glove bags - 8105PI5201.
- Asbestos disposal bags, 6 mil. 8105LMC00204. Bags must be clear with all labeling.
- Polyethylene sheeting, 6 mil. 933ONLO10629 (4 mil (933OL872040) may be substituted, but polyethylene must be tripled to achieve at least 12-mil thickness).
- Warning signs and barrier ropes.
- Duct tape 2" 5640-00-103-2254.
- Garden sprayer filled with amended water.
- Garden sprayer filled with encapsulation material.
- HEPA filtered vacuum cleaner.
- Razor knife, steel wire brush, etc.
- Paper towels.
- Ladder (as appropriate).

Other Asbestos Removal Supplies Found in Warehouse

- Surfactant, asbestos wetting agent, 6-gallon container 685OP40101.
- Asbestos free labels, 500 per roll 769OP35101.
- Asbestos danger labels, 3" x 5" 769OP35105.
- Warning tape, asbestos removal 3" wide, 1000'roll 75 1OP35106.
- Spray glue 8040POO1700.
- Bridging encapsulant 801OP2B.
- Penetrating encapsulant 801OP22P.
- Bag, disposable, for use in Nilfisk G582 vacuum 791OP815840.
- Nilfisk GS81 vacuum 79 1 OP814550.
- HEPA exhaust filter cartridge 791OP017276-01.

Items not found in the warehouse may be acquired through normal purchasing efforts. Items not on this list shall be approved by **Base** Operating Contractor Safety, Health and **Environmental** before use.

A321-0801-XSP E7 Asbestos Supplement

This supplement has been approved for the NFAC Site.

Review: This supplement will be reviewed and updated using the same cycle as the AEDC Safety Standard A2 "Asbestos".

References: AEDC Safety Standard E7 – Asbestos at the AEDC NFAC Site.

NASA Ames Procedural Requirement APR 1700.1 Chapter 30 Asbestos Management Plan.

Scope:

This supplement provides requirements and responsibilities for procurement, use, handling, and disposal of asbestos and materials containing asbestos for the NFAC operating contractor, customers, and vendors at NFAC.

This supplement is intended to implement State, Federal and NASA asbestos regulations.

This supplement applies to all personnel conducting operations, maintenance, testing and support at NFAC, NASA AMES.

NFAC Worksite Application:

NFAC will follow the NASA Ames Procedural Requirement APR 1700.1 Chapter 30 Asbestos Management Plan.

No one is to disturb the asbestos/spill material unless licensed to do so.

Any loose asbestos/spill material found on the facility will always be treated as hazardous waste and disposed of through the NASA Ames hazardous waste stream.

I. NFAC Site Management shall:

1. Ensure the entire staff has been trained on asbestos awareness and unless certified will not disturb any asbestos at NFAC.

II. NFAC Staff shall:

1. Ensure that a maintenance/operations/test activity does not disturb the asbestos.
2. Ensure if asbestos has to be disturbed it must be performed by currently licensed asbestos personnel.
3. Maintain their annual required asbestos awareness training through NASA Satern program.

III. NFAC Safety Engineer/Management Designee shall:

1. Provide information to customers, vendors and new hires on the asbestos throughout the facility.
2. Inform them not to disturb the asbestos and if they find any loose asbestos it is to be treated as hazardous waste and disposed of properly.
3. Notify AEDC Operations Center.