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CHAPTER 11.5 GENERAL ASBESTOS WORK REQUIREMENTS

11.5.1. What this chapter covers

11.5.1.1 This chapter covers the following general requirements for any asbestos work at JSC, to include:

- a. Medical surveillance requirements.
- b. Training requirements.
- c. Respiratory protection requirements.
- d. Personal protective clothing and equipment.
- e. Decontamination.
- f. Secure electrical, fire, and HVAC systems.
- g. Electrical power hazards.
- h. Slips, trips, and falls.
- i. Confined spaces.
- j. Ladders and scaffolds.
- k. Heat stress.
- l. Prohibited activities.

11.5.2. Medical surveillance requirements

11.5.2.1 Asbestos workers shall follow these requirements for medical surveillance:

- a. You can find medical surveillance requirements in three OSHA regulations. Refer to the listed regulations for details and specifications of these requirements. Note that all three regulations require a physician's written opinion. These three regulations are:
 - (1) 29 CFR 1926.1101, "Construction Industry Standard for Asbestos," requires employees who perform Class I, II, and III asbestos work for 30 or more days per year, or those who are exposed to airborne concentrations of asbestos at or above the PEL, to be enrolled in a medical surveillance program.
 - (2) 29 CFR 1910.1001, "General Industry Standard for Asbestos," requires all employees who are exposed to airborne concentrations of asbestos at or above the PEL to be enrolled in a medical surveillance program.
 - (3) 29 CFR 1910.134, "Respiratory Protection Standard," specifies that any employee required to wear respiratory protection equipment while performing his or her job shall receive a medical evaluation.
- b. Medical examinations are required before asbestos work or exposure (pre-placement), annually, and upon termination of employment and are also required to determine an

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employee's ability to perform work while wearing a respirator. The frequency of medical evaluations for asbestos workers and respirator wearers at JSC is listed in Chapter 3.6.

- c. The medical support contractor provides medical surveillance of JSC civil service employees. On-site resident support contractor employees receive medical surveillance as specified in their contract. Fixed-price contractors shall provide the required medical surveillance from medical resources other than JSC.
- d. Medical surveillance is not required for building occupants since no ambient levels of asbestos fibers have been identified within JSC facilities that would expose building occupants to even a significant fraction of the JSC action level.

11.5.3. Training requirements

11.5.3.1 When an entire area is turned over to a contractor, who was hired for Class I or Class II asbestos abatement of a building, a floor, or a room; the contractor's asbestos workers are not required to take JSC site-specific training. However, the workers shall be current in their Class I or Class II asbestos training, as described below. Competent Persons for off-site contractors shall meet the requirements of Chapter 11.7.

11.5.3.2 The following subparagraphs list the JSC minimum training requirements for Class I, II, III, and IV asbestos work. The OSHA Construction Industry Standard for Asbestos, 29 CFR 1926.1101(k) (9), provides the basis for this training. Complete the training for your appropriate class of asbestos work before or at the time of your initial assignment and take refresher training at least annually thereafter. Training requirements are as follows:

- a. All Class I work and any Class II work that uses critical barriers or negative pressure enclosures. Initial training equivalent to the 4-day EPA Model Accreditation Plan asbestos abatement worker training specified in 40 CFR 763, Subpart E, Appendix C. If you have a current certificate or license issued under 25 TAC 295.42 for an Asbestos Abatement Worker, you meet this requirement. Currency in this training expires exactly 12 months after the date of the initial or last refresher training, and you may not perform Class I or Class II work activities until you have again received the required 8-hour refresher training. If you let more than 24 months lapse since the date of your last training, you shall retake the initial training. You shall have a current medical examination and respirator fit test.
- b. All other Class II work. Only for work involving ACM roofing materials, flooring materials, siding materials, ceiling tiles, or transite; training shall meet these requirements:
 - (1) Initial 8-hour training equivalent to the requirements specified in 29 CFR 1926.1101(k) (9) (iv).
 - (2) Currency in this training expires exactly 12 months after the date of the initial or last refresher training. You may not perform Class II work activities until you have again received refresher training. If you let more than 24 months lapse since the date of your last training, you shall retake the initial training.
 - (3) Current medical examination and respirator fit test.

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c. Class III work. Training shall meet these requirements:

- (1) Initial 16-hour Operations and Maintenance training equivalent to the requirements specified in 29 CFR 1926.1101(k) (9) (v) and 40 CFR 793.92(a) (2).
- (2) Currency in this training expires 12 months after the date of the initial or last refresher training. If you can demonstrate that you are scheduled for refresher training, you may continue to perform Class III asbestos-related work on site at JSC until receiving the scheduled refresher training, but not longer than 14 months after the date of your last training.
- (3) If you let more than 24 months lapse since the date of your last training, you shall retake the initial training.
- (4) Current medical examination and respirator fit test.
- (5) When emergency response involves a cleanup of a major fiber release episode, the responders shall have training meeting the requirements of Class I asbestos work (see above).

d. JSC Site-Specific Asbestos Training for Class I, II and III Work. All onsite workers performing any Class I, II or III asbestos work are required to take the JSC Site-Specific course to acquaint them with JSC conditions, JSC procedures, and job-specific performance requirements described in Chapter 11.15 and Chapter 11.16. Occupational Health offers this course only by request. An exception exists for off-site contractors; see subparagraph h. below.

e. Restricted Class III asbestos operations and maintenance work. All employees (contractor or civil service) at JSC who work in ceiling plenums or mechanical rooms, beneath computer floors, and anywhere that ACM could potentially be disturbed shall complete the JSC 8-hour Asbestos Site-Specific and Class III (Restricted) Worker Training course offered by Occupational Health. This course, along with medical surveillance or evaluation and a current respirator fit test, is required before conducting restricted Class III activities at JSC. Refresher training requires completion of the JSC 2-hour Asbestos Site-Specific and Class III (Restricted) Worker Refresher course offered by Occupational Health. Additional discussion about this JSC training is provided below:

- (1) JSC Class III Asbestos O&M (Restricted): The work is considered restricted because it is limited to the specific areas and specific conditions at JSC where activities have the potential to disturb asbestos-containing SAI or to disturb dirt or dust containing SAI debris. The asbestos work is restricted because it does not include removal or abatement of any ACM. This encompasses work in ceiling plenums or mechanical rooms, beneath computer floors, and anywhere that ACM could potentially be disturbed. For example, entry into ceiling plenums to “pull cables” or install electrical utility lines in buildings with SAI falls under this classification.
- (2) The JSC Class III Asbestos O&M (Restricted) initial and refresher courses neither address nor train workers to perform the other types of Class III asbestos-related work, such as glovebag removal or spot abatement of ACM. If you perform actual removal of ACM for operations and maintenance activities, you shall meet the appropriate training requirements for asbestos Class I, II, or III work as described in the paragraphs above.

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- (3) Currency in the JSC Class III Asbestos O&M (Restricted) training expires 12 months after the date of the initial or last refresher training. If you can demonstrate that you are scheduled for refresher training from Occupational Health, you may continue to perform restricted Class III asbestos-related operations and maintenance work on site at JSC until receiving the scheduled refresher training, but not longer than 14 months after the date of your last training. If you let more than 24 months lapse since the date of your last training, you shall retake the initial training.
- f. Class IV work (except emergency response). Training equivalent to the requirements specified in 29 CFR 1926.1101(k) (9) (vi) and 40 CFR 793.92(a) (2). This 2-hour awareness training class includes specific topics and work practices.
 - g. Resilient Floor Covering Institute (RFCI). Training in the methods specified by the RFCI for the removal of resilient floor coverings and adhesives that contain asbestos. These floor coverings may be: (i) sheet flooring that contains asbestos or has an asbestos felt backing, (ii) vinyl or asphalt floor tiles, or (iii) adhesives and mastics. Employees who remove floor coverings and adhesives using RFCI methods at JSC shall also have Class II (32-hour) or Class III (16-hour) asbestos training as required by the activity. Training in RFCI methods shall last a minimum of 8-hours. The specific RFCI methods may be found in the RFCI document "[Recommended Work Practices for Removal of Resilient Floor Coverings](http://www.rfci.com/index.php)" at <http://www.rfci.com/index.php>.
 - h. JSC Site Specific Training for Off-Site Contractors Conducting Class I, Class II, and Class III Asbestos Work. Off-site contractors who conduct small scale Class I/ II work or Class III work using the pre-approved project designs described in Chapter 11.15 and Chapter 11.16, shall have competent persons take the 2-hour Occupational Health training course to acquaint them with JSC conditions, JSC procedures, and job-specific performance requirements described in Chapter 11.15 and Chapter 11.16. Occupational Health will offer this course only by request from the contractor. The competent persons must provide proof of currency in 40-hour initial or 8-hour refresher Contractor/Supervisor training either before the course start date or at the time of the course.
 - i. Training for Custodial Workers. Employees involved in housekeeping and custodial activities at JSC in areas with ACM (e.g., acoustical, or decorative treatments and flooring materials) shall receive annual awareness training. They will also receive training in the use of High-Efficiency Particulate Air (HEPA) vacuum cleaners and methods to avoid the generation of asbestos fibers from flooring materials as referenced in 29 CFR 1910.1001(k) and 29 CFR 1926.1101(l).
 - j. Training for any employees likely to be exposed above the PELs for asbestos shall meet the minimum training requirements specified in both 29 CFR 1910.1001(j) (7) and 29 CFR 1926.1101(k) (vii) and (viii).
 - k. Training for employees required to wear respiratory protection for any level of work involving asbestos materials shall meet the requirements of 29 CFR 1910.134.
 - l. Fixed-price contractors subject to these training requirements shall provide documented proof of required training for their workers and supervisors before proceeding with work identified within Part 11.
 - m. Building occupants shall receive asbestos awareness training through the annual JSC requirement for Hazard Communication Training.

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11.5.4. Respiratory protection requirements

11.5.4.1 The following requirements apply for respiratory protection:

- a. JSC policy requires the use of respirators when they are necessary to protect the health of the employee and reduce the risk of asbestos exposure during asbestos-related activities. Employees shall follow the basic OSHA requirements in 29 CFR 1910.134 and chapter 7.2.
- b. JSC provides respirators at no cost to civil service employees. Respiratory protection for on-site support contractor employees will be provided as specified in their contract. Fixed-price contractors subject to these requirements shall furnish their own equipment and provide documented proof of fit testing, medical surveillance, and training for their workers and supervisors before proceeding with work identified within Part 11.
- c. Employees who perform any Class I, II, or III asbestos work at JSC shall wear appropriate respiratory protection. Employees who perform Class IV asbestos work may be required to wear respiratory protection. Select respirators based on the requirements stated in either 29 CFR 1926.1101(h) or 29 CFR 1910.1001(g) and chapter 7.2.
- d. Select all respiratory protection devices from those approved by NIOSH. Workers performing asbestos activities are prohibited from wearing a filtering face-piece respirator. Employees who must wear a respirator shall not wear a beard or other facial hair that would interfere with the facial seal with the face piece. See Chapter 5.6 for contact lens use.
- e. Employees required to wear a half-mask respirator shall wear safety glasses with side shields or safety goggles.

11.5.5. Personal protective clothing and equipment

11.5.5.1 Asbestos workers shall follow these requirements to protect themselves:

- a. Provide personal protective clothing and equipment required for employees engaged in asbestos-related activities as specified in Part 11. Follow the PPE requirements in chapter 5.6. If you are exposed to hazardous noise, follow the hearing protection requirements in chapter 7.1. Additionally, you can find OSHA requirements on PPE in the following standards:
 - (1) 29 CFR 1910.132, "General Requirements for Personal Protective Equipment"
 - (2) 29 CFR 1910.133, "Eye and Face Protection"
 - (3) 29 CFR 1910.135, "Head Protection"
 - (4) 29 CFR 1910.136, "Foot Protection"
 - (5) 29 CFR 1910.138, "Hand Protection"
 - (6) 29 CFR 1910.95, "Occupational Noise Exposure"
- b. Wear protective clothing and equipment during asbestos-related work to protect from gross contamination of the body, hair, etc., and to provide protection from other physical hazards in the workplace. The proper use of protective clothing, coupled with the appropriate use of decontamination showers, as required, and HEPA-filtered vacuum cleaners, will minimize your chance of bringing asbestos out of the work area and into your general environment and home.

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- c. Use protective equipment, such as hard hats and eye protection, as required in chapter 5.6 or as determined by the designated Competent Person, the job supervisor, or the JSC Safety and Test Operations Division.
- d. Never use street clothes (or shoes), T-shirts, blue jeans, sweatbands, kneepads, or socks as protective clothing. If you use any of these items inside the work area, you shall remain there until the job is completed and either be decontaminated using HEPA-filtered vacuum cleaners or wet wiping, or alternatively have these items disposed of as asbestos-contaminated waste.
- e. Keep other protective clothing or items, such as hard hats and safety shoes or boots, if required, or other appropriate footwear, in the work area for the duration of the project. Upon project completion, you can clean these items, place them in a plastic bag, label them as asbestos contaminated, and take them to the next project. If these items cannot be decontaminated, dispose of them at the end of the project as asbestos-containing waste.
- f. Protective clothing for asbestos-related work shall consist of disposable coveralls and gloves. These coveralls are normally paper or a synthetic material (i.e., Tyvek) with built-in or attached hoods and booties. Do not cut the hood or booties from the coveralls. After each use, discard these items as asbestos-contaminated waste. Disposable coveralls, such as Tyvek, are extremely vulnerable to hot surfaces or open flames. They burn rapidly, and some plastic materials may melt and severely damage exposed skin.

11.5.6. Decontamination

11.5.6.1 Asbestos workers shall follow these requirements for decontamination after asbestos work:

- a. Complete the decontamination sequence after leaving an asbestos Regulated Area for any reason. Visible signs of asbestos will not be tolerated in areas serving building occupants.
- b. Ensure that the degree of decontamination is directly proportional to the potential of exposing someone outside the work area. For the majority of JSC jobs, where disposable clothing is worn and where an enclosure is not required, first use a HEPA-filtered vacuum on or wet wipe the protective clothing, then carefully remove the protective clothing and bag it as asbestos-containing waste. Bag contaminated materials for disposal as asbestos waste.
- c. When it is necessary to work within a large enclosure, in-process through a “hygiene unit” or “clean room” to change from street clothes into work clothes and out-process through the decontamination or hygiene units to remove contaminated work clothing, decontaminate, and change back into street clothes.

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11.5.7. Secure electrical, fire alarm, and HVAC systems

11.5.7.1 Asbestos workers shall take the following actions to secure critical systems before starting asbestos work:

- a. Secure or deactivate all electrical, fire alarm, and HVAC systems in the work area before a major abatement activity, especially when it is necessary to construct a large enclosure. Activities involving small-scale or incidental asbestos exposure will generally not require securing the electrical, fire alarm, or HVAC systems; however, you will need to evaluate this on a case-by-case basis. Regardless, you shall coordinate any outage of electrical or HVAC systems through work control using established procedures.
- b. De-energize the electrical systems serving the work area and control their operation before any wet operations begin. The amended water used to saturate ACM creates a humid environment and a potential hazard.
- c. Disable fire alarm sensors before and throughout the project and have the Fire Protection Coordination Office approve all fire alarm sensor outages. They can be triggered during abatement activities.
- d. Shut down, isolate, and control the HVAC in the work area before and during any asbestos-related activity. The HVAC system, if left operational in an asbestos work area, represents a potential route for spreading ACM fibers into other areas of the facility and, therefore, increases the risk of employee exposure.
- e. Cover and seal all vents and air ducts inside the work area with two layers of 6-mil plastic and tape.
- f. If the HVAC system supplying the work area supplies other areas in the building that are still operational, de-energizing the system may not be feasible develop an alternate method of isolating the work area portion of the HVAC.
- g. Control electrical and HVAC systems shut down or de-energized at the point of isolation with an orange JSC Form 19A, "WARNING – DO NOT OPERATE" tag, and a lock (the lock shall be a color other than red). Use this tag and the operation or energy control procedures found in Chapter 8.2 to ensure the systems are controlled.

11.5.8. Electrical power hazards

11.5.8.1 One of the most common hazards, and one that gives the least warning, is electrical power. Incorrect wiring, improper grounding, and lack of proper shielding in the wet environment of asbestos-related activities can significantly increase workers' risk. To lessen the risk of injury, asbestos workers shall follow the requirements in chapter 8.1 and take the following actions:

- a. De-energize as much of the work electrical system as possible.
- b. Use portable light systems.
- c. Use nonconductive scrapers, tools, and vacuum attachments.
- d. Use hot-line covers over energized cables and power lines when possible.
- e. Use caution to avoid damaging power cable insulation with scrapers, shovels, scaffolding, and wheeled equipment.

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- f. Avoid stringing electrical wiring across floors. Elevate wiring, if possible, to keep it away from litter on the floor, physical abuse, and damage from equipment use.
- g. Use stable, wooden or fiberglass ladders – not metal.
- h. Consider electrical equipment and lines to be energized unless tested and determined otherwise.
- i. Use three-wire type extension cords with portable electric tools and appliances and connect them to a GFCI.
- j. Equip all 120-volt, single-phase, 15- and 20-ampere receptacle outlets in the work area that are not part of the permanent wiring of the building or structure with an approved GFCI.
- k. Establish and implement an assured equipment grounding conductor program covering all cord sets and receptacles that are not part of the permanent wiring of the building or structure, and equipment connected by cord and plug, which is available for use or used by employees on asbestos-related activities covered by Part 11.

11.5.9. Slips, trips, and falls

11.5.9.1 Asbestos-related projects, particularly abatement projects, are inherently dangerous for numerous reasons: the presence of multiple layers of plastic sheeting on the floor, the accumulation of debris, poor lighting, and the need to work from ladders and scaffolds. To deal with these problems, asbestos workers shall take steps to prevent slips and falls in the work areas:

- a. Install the first layer of floor sheeting as tight and flat as possible. Secure the second layer of plastic to the first with tape, spray adhesive, or other means. (This will reduce the chance of the two layers sliding over one another.)
- b. Keep electrical lines off the work floor by taping them high on the wall, behind the wall plastic if possible.
- c. Do not allow debris from abatement activities to pile up or lay about. Pick up and place the material in appropriate containers at the time of generation.
- d. Select a secure area out of the normal traffic pattern for the temporary storage of waste bags.
- e. For plastic floor sheeting on stairs, install a nonskid surface over the plastic on each tread. Do not cover stairs unless they require protection from water damage.
- f. Ensure that all workers in the work area wear a good-quality protective shoe or boot. Rubber boots that provide good traction are preferred. Rubber boots also provide some protection from electrical shock as well as being easy to clean. Workers should not wear Tyvek booties on the outside of their work shoes.
- g. Always follow established procedures for the installation and use of ladders and scaffolds.
- h. Always be on the lookout for tools, cable equipment, etc., left lying about the work area that may trip you as you move about. Most abatement work requires that you be constantly looking at the ceiling or pipes overhead.

11.5.10. Confined spaces

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Asbestos workers may encounter confined spaces in asbestos-related activities. A confined space is a space that, by design, has limited openings for entry and exit; that has unfavorable natural ventilation, which could contain asbestos fibers, other hazardous materials or is oxygen-deficient; and that is not intended for continuous employee occupancy. Confined spaces can include, but are not limited to, storage tanks, process vessels, pits, vats, degreasers, security vaults, boilers, underground utility tunnels or vaults, and pipelines. This JPR and the OSHA requirements in 29 CFR 1910.146 govern entry into confined spaces during asbestos-related activities. Anyone working in a confined space at JSC shall complete the JSC Confined Space Training Course at the JSC Safety Learning Center or the Houston Area Safety Council before working in a confined space at JSC. Any asbestos-related work in a confined space, including the underground utility tunnels, requires a confined space procedure and permit approved by Occupational Health and the Safety and Test Operations Division. Follow Chapter 6.9.

11.5.11. Ladders and scaffolds

Asbestos-related activities specified in Part 11 routinely use ladders and scaffolds. Both items represent potential safety hazards. Use ladders and scaffolds at JSC per the requirements in Chapter 8.7 and the OSHA requirements of 29 CFR 1910.25, 29 CFR 1910.26, 29 CFR 1926.450–454, and 29 CFR 1926.1053.

11.5.12. Heat stress

11.5.12.1 Asbestos workers shall take the following measures to control heat stress:

- a. Control employees' total heat exposure when conducting JSC asbestos-related activities so that workers are not exposed to combinations of metabolic and environmental heat, which produce unacceptable heat stress. Heat stress, for the purpose of Part 11, is the total effect of environmental and physical factors that makes up the total heat load imposed on the body. Unacceptable heat stress is defined as any combination of metabolic and environmental heat that produces any symptom or adverse effect.
- b. Several biological effects can occur from heat stress. They include, in increasing order of severity, heat rash, heat cramp, heat exhaustion, and heatstroke. Heatstroke is an acute medical emergency that requires immediate medical attention. If you are a work area supervisor, you shall be familiar with the signs and symptoms of these conditions and take appropriate action whenever any worker shows signs of heat stress.
- c. The major factors affecting heat exchange between a person and the environment are air temperature and humidity, skin temperature, air velocity, evaporation of sweat, and radiant temperature, as well as type, amount, and characteristics of clothing. Summer weather in Houston is both hot and humid.
- d. Protective clothing required for asbestos-related activities serves as a barrier against gross contamination of the body by asbestos materials and the potential spread of asbestos to uncontrolled environments. It also alters the rate and amount of heat exchange between the skin and the ambient air, thus increasing the stress of metabolic and environmental heat.
- e. The effects of heat stress can be increased if the individual is using alcohol, therapeutic drugs, or social drugs while being exposed to high heat stress in the work environment. Many drugs prescribed for therapeutic purposes also affect the body's mechanisms for adapting and

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adjusting to heat stress. If you require therapeutic medication, you may not work asbestos-related activities that may promote heat stress unless you are under the supervision of a physician who provides a written opinion that you will not be adversely affected by the heat stress of the proposed work activity.

- f. To the extent possible, use only employees acclimated to heat stress in asbestos-related activities requiring full protective clothing and work area enclosures.

11.5.13. Prohibited activities

11.5.13.1 While in an asbestos Regulated Area, workers shall never:

- a. Smoke
- b. Eat
- c. Drink
- d. Chew gum or tobacco or use snuff
- e. Apply cosmetics