insulation or application of acoustic materials;

3. By acoustical enclosure of the noise producer;
4. By isolation of the noise producer so that the noise will affect fewer employees;

5. By substitution of less noisy operations (i.e., welding in lieu of riveting); or

6. By administrative controls which limit exposure (i.e., control of work schedules).

12. RESPONSIBILITIES

a. Site managers are responsible for:

1. Ensuring the establishment of a comprehensive Hearing Conservation Program, when required;

2. Ensuring all appropriate individuals are identified and participate in the Program;

3. Appointing a qualified person to oversee the program (generally, an industrial hygienist, ASR, or OUSHR with appropriate training is considered qualified); and

4. Ensuring that adequate funds are available to provide for noise monitoring, engineering controls, and procurement of examination services and hearing protection devices for all employees placed in the Hearing Conservation Program.

b. Supervisors are responsible for:

1. Informing the ASR of job conditions that are suspected of exposing employees to noise hazards;

2. Ensuring that all employees whose jobs require the wearing of hearing protection devices receive instruction in the selection, use, and maintenance of such equipment;

3. Ensuring employees are provided with and properly use required hearing protection devices; and

4. Taking appropriate action to implement and enforce the Hearing Conservation Program requirements discussed in this chapter.

c. Employees are responsible for:

1. Notifying their supervisor or ASR of conditions that could result in exposure to hazardous noise levels;

2. Obtaining and wearing appropriate hearing protection devices whenever required and in accordance with instructions and training received;

3. Participating in training sessions provided by the ASR;

4. Maintaining the hearing protective devices in a clean and sanitary condition; and

5. Notifying their supervisor when replacement devices are needed.

d. ASRs or other qualified persons appointed to oversee the Hearing Conservation Program are responsible for:

1. Conducting a complete survey of all work areas, processes, and operations to identify hazardous noise areas. Conducting follow-up monitoring as required;

2. Identifying and maintaining a roster on personnel placed in the Program;

3. Determining if hearing protective devices are required based upon the nature and/or extent of noise hazards;

4. Advising supervisors and users on proper selection of hearing protective devices;

NOTE: In field locations, if the ASR requires assistance in determining the need for and the selection of hearing protective devices, the appropriate RSM or OUSHR should be contacted for guidance.

5. Providing training to supervisors and employees in the Hearing Conservation Program, as required; and

6. Conducting random inspections to ensure that hearing protective devices are being properly used, maintained and stored.

e. OUSHRs and RSMs are responsible for providing guidance to ASRs, managers, and employees on compliance with the Hearing Conservation Program.

TABLE 15-1

PERMISSIBLE NOISE EXPOSURES[1]

Duration per day, hours	Sound Level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
1/4 or less	115

[1]When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 \ldots C_n T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the time value. C_n indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

TABLE 15-2
NOISE EXPOSURE COMPUTATION

Employee Noise Exposure

A-wt. Sound level L(decibels)	Reference
80	32
81	27.9
82	24.3
83	21.1
84	16.4
85	16
86	13.9
87	12.1
88	10.6
89	9.2
90	8
91	7.0
92	6.1
93	5.3
94	4.6
95	4
96	3.5
97	3.0
98	2.6
99	2.3
100	2
101	1.7
102	1.5
103	1.3
104	1.1
105	1
106	0.87
107	0.76
108	0.66
109	0.57
110	0.5
111	0.44
112	0.38
113	0.33
114	0.29
115	0.25
116	0.22
117	0.19
118	0.16
119	0.14
120	0.125
121	0.11
122	0.095
123	0.082
124	0.072
125	0.063
126	0.054
127	0.047
128	0.041
129	0.036
130	0.031

In the above table the reference duration, T1 is computed by

$$T = \frac{8}{2^{(L-90)/5}}$$

where L is the measured A-weighted sound level.

In order to convert the reading of a dosimeter into TWA, see Taable 15-2a. This table applies to dosimeters that are set by the manufacturer to calculate dose or percent exposure according to the relationships in Table 15-2. So, for example, a dose of 91 percent over an eighthour day results in a TWA of 89.3dB, and , a dose of 50 percent corresponds to a TWA of 85 dB.

TABLE 15-2a CONVERSION FROM "PERCENT NOISE EXPOSURE" OR "DOSE" TO "8-HOUR TIME-WEIGHTED AVERAGE SOUND LEVEL" (TWA)

Dose or percent noise exposure	TWA
10	73.4
15	76.3
20	78.4
25	80.0
30	81.3
35	82.4
40	83.4
45	84.2
50	85.0
55	85.7
60	86.3
65	86.9
70	87.4
75	87.9
80	88.4
81	88.5
82	88.6
83	88.7
84	88.7
85	88.8
86	88.9
87	89.0
88	89.1
89	89.2
90	89.2
91	89.3
92	89.4
93	89.5
94	89.6
95	89.6
96	89.7
97	89.8
98	89.9
99	89.9
100	90.0
101	90.1
102	90.1
103	90.2
104	90.3
105	90.4
106	90.4
107	90.5
108	90.6
109	90.6
110	90.7
111	90.8
112	90.8
113	90.9
114	90.9
115	91.0
116	91.1
117	91.1
118	91.2
119	91.3
120	91.3
125	91.6
130	91.9
135	92.2
140	92.4
145	92.7
150	92.9
155	93.2
160	93.4
165	93.6
170	93.8
175	94.0
180	94.2
185	94.4
190	94.6
195	94.8
200	95.0
210	95.4
220	95.7
230	96.0
240	96.3
250	96.6

TABLE 15-2a Cont.

Dose or percent noise exposure	TWA
260	96.9
270	97.2
280	97.4
290	97.7
300	97.9
310	98.2
320	98.4
330	98.6
340	98.8
350	99.0
360	99.2
370	99.4
380	99.6
390	99.8
400	100.0
410	100.2
420	100.4
430	100.5
440	100.7
450	100.8
460	101.0
470	101.2
480	101.3
490	101.5
500	101.6
510	101.8
520	101.9
530	102.0
540	102.2
550	102.3
560	102.4
570	102.6
580	102.7
590	102.8
600	102.9
610	103.0
620	103.2
630	103.3
640	103.4
650	103.5
660	103.6
670	103.7
680	103.8
690	103.9
700	104.0
710	104.1
720	104.2
730	104.3
740	104.4
750	104.5
760	104.6
770	104.8
780	104.9
790	104.9
800	105.0
810	105.1
820	105.2
830	105.3
840	105.4
850	105.4
860	105.5
870	105.6
880	105.7
890	105.8
900	105.8
910	105.9
920	106.0
930	106.1
940	106.2
950	106.2
960	106.3
970	106.4
980	106.5
990	106.5

TABLE 15-3

POSITIVE AND NEGATIVE FEATURES OF HEARING PROTECTIVE DEVICES

TYPE	POSITIVE	NEGATIVE	DURATION
Insert			
Single Flange Triple Flange	After adaptation, can be used for long periods. Relatively inexpensive.	Individual fitting by medical personnel required. Frequent irritation	Long term (3-4 hours)
Headband Ear Caps			
Sound-Ban	Quickly fitted without touching ear canal. Easily carried.	Uncomfortable after one hour.	Short term. Frequently off/on.
Disposable			
Silaflex Ear Deci-Damp	Comfortable. Individual fitting not required. Relatively inexpensive.	Molded by hand. Easily soiled. Difficult to clean.	Infrequent use. Transitory noise exposure.
Circumaural Muffs			
Type I & II	May be worn over plugs. Most efficient universal device.	Expensive. Heavy. Difficult to carry. Hair or eyeglasses may reduce effectiveness.	Long or short term.

One single type of hearing protective device will not meet the needs of all personnel in a Hearing Conservation Program. The appropriate type of hearing protective device should be selected based upon a consideration of the factors listed above in addition to the degree of attenuation required in a particular situation. The most convenient method of estimating the degree of attenuation is the Noise Reduction Rating (NRR) developed by the Environmental Protection Agency (EPA). The NRR is usually shown on the hearing protector package. The NRR is then compared to an individual work's noise environment in order to assess the adequacy of the attenuation of

a given hearing protector.

CHAPTER 16

CONFINED SPACE ENTRY PROGRAM

01. DISCUSSION

a. The DOC policy is that a Confined Space Entry Program which complies with this chapter and 29 CFR 1910.146 must be implemented at a site before entry into a confined space is attempted. No person shall enter any closed compartment or poorly ventilated space unless a confined space entry program has been developed and complied with and the danger of poisoning, suffocation, or ignition of flammable gases have been eliminated or reduced to the lowest practical level and the qualified person has issued a certificate allowing entry. All employees associated with confined space entry must be trained to recognize the hazards associated with this work. Supervisors must ensure that the requirements of the Confined Space Entry Program in this chapter have been followed.

b. A confined space is an enclosed space, which because of its small size and confined nature, can readily create or aggravate an exposure to a hazardous condition. A confined space is large enough and so configured that employee can bodily enter and perform work; has limited or restricted openings for entry and exit; has one or more of the following: contains or has potential to contain a hazardous atmosphere, contains material with the potential for engulfment of the entrant, has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross section or contains other recognized serious safety or health hazards; and is not intended for continuous employee occupancy.

c. In enclosed space is a space enclosed on the sides and overhead by walls or bulkheads. An enclosed space may or may not also be classified as a confined space.

d. Most of the fatalities in confined spaces occur because the atmosphere within the confined space is either oxygen-deficient or toxic. Testing, evaluating, and monitoring the atmosphere within the confined space is critical. Improper work practices and procedures for emergencies and rescue operations contribute to the number of fatalities associated with confined space work.

e. Workers in many occupations may be required to enter confined spaces. Typical confined spaces include but are not limited to sewer lines, tanks (septic tanks, holding tanks, storage tanks), silos, vats, ducts, underground utility vaults, reaction vessels, boilers, pits, compartments of ships, ventilation and exhaust ducts, tunnels, and pipelines. Employees of DOC may be required to enter these types of spaces in the normal course of their work.

02. RESPONSIBILITIES

a. **Site managers/supervisors** are responsible for:

1. Establishing a written Confined Space Entry Program for their specific operations where entry into a confined space is anticipated.

2. Ensuring that the requirements of the Confined Space Entry Program are followed prior to entry into any confined space.

3. Training all employees who may be involved in confined space entry in the hazards associated with their duties and responsibilities before entry into a confined space.

4. Appointing a qualified person to oversee the program and to ascertain that the requirements of the program have been met prior to entry into a confined space.

5. Determining the need to enter Class A confined spaces.

b. **Entrant** is responsible for:

1. Complying with the requirements of the Confined Space Entry Program.

2. Wearing required personal protective equipment while within confined space.

3. Maintaining contact with an attendant while inside the confined space.

4. Responding appropriately to a personal monitor alert.

c. The **qualified person** is responsible for:

1. Testing and evaluating all confined spaces prior to authorizing entry. Recertifying the space after work interruptions.

2. Issuing the permit for work within the confined space.

3. Coordinating all work within confined spaces at a site.

4. Ensuring all test equipment is maintained and calibrated.

5. Evaluating the confined space and surrounding area. Developing engineering methods to control hazards associated with the operations.

6. Notifying the rescue team supporting a confined space emergency response prior to commencing work in a confined space, to insure availability and capability.

d. The **attendant** is responsible for:

1. Monitoring entry and departure of authorized persons into the confined space.

2. Monitoring conditions (atmosphere, employees, progress of work) within the confined space while employees are inside the space.

3. Initiating the alert for emergency and rescue operations or commencing rescue from outside the space.

4. Remaining outside the confined space at all times.

5. Controlling the work site by posting and/or barricading.

03. CONFINED SPACE ENTRY PROGRAM REQUIREMENTS

a. Recognition and Testing.

1. Evaluation.

(a) Prior to commencing work in a space, an evaluation shall be made as to whether the space meets the definition of a confined space. (Refer to Section I(b) of this chapter or the glossary).

(b) The characteristics of the space should be evaluated for ventilation potential, entry and exit points, equipment inside the space whether operating or not, and the need to isolate the space from other energy sources prior to entry.

2. Testing.

2. If the space meets the definition of a confined space, testing of the atmosphere within the space must be conducted prior to allowing any employees to enter the space.

(b) Initial testing of the atmosphere within the confined space shall be conducted from outside of the space.

(c) Testing shall be conducted for oxygen content, flammability hazard through testing for the percent of the L.E.L (lower explosive limit) present, and carbon monoxide. In addition, if it is suspected that other contaminants may be present, tests shall be conducted for those suspected contaminants. Some frequently encountered contaminants include but are not limited to aromatic hydrocarbons, Freon, hydrocyanic acid, hydrogen sulfide, nitrogen dioxide, carbon dioxide, sulfur dioxide, and ammonia.

b. Evaluation and Monitoring.

1. Once testing has been conducted, the results should be compared against the established limits for the various contaminants tested. An adequate number of tests should be taken to determine the level of atmospheric substances relative to the respective Permissive Exposure Limits (PEL). Because some PEL are also ceiling values, samples must be taken to determine peak concentrations during various phases of the entire operation.

2. Based on the results for oxygen content, flammability, and toxicity, and the characteristics of the space, the space shall be classified as a Class A, B, or C confined space.

(a) A Class A confined space is one in which any of the hazards identified present a situation which is immediately dangerous to life and health (IDLH). Any space with an oxygen deficient atmosphere is a Class A space.

2. A Class B confined space is one in which the potential for injury and illness exists but is not immediately dangerous to life and health.

(c) A Class C confined space is one in which the hazard potential for injury or illness would not require any special modification of the work procedure.

3. The classification shall be made based on the most hazardous conditions expected while entering, working in, and exiting the confined space.

4. Continuous monitoring of the space while the work is being performed is required for a Class A and B confined space and may be necessary for a Class C space. The need for additional monitoring of a Class C space shall be determined by the qualified person. Monitoring in Class C is mandatory when work procedures effect the atmosphere. Personal monitors provide continuous monitoring.

c. Establishment of Work Procedures and Practices.

1. Entry into a confined space requires careful preparation. Table I provides a check list of items to consider when entering, working in, and exiting confined spaces. If necessary, the area surrounding the confined space operation should be posted and barricaded to prevent unnecessary traffic and warn other personnel of the operation. Refer to 29 CFR 1926.251. Consideration of all items in the check list and completion of the "permit" is required prior to entry into a confined space.

(a) Entry into a Class A confined space is not recommended. The highest level supervisor/site manager at facility must be involved in the decision process prior to authorizing work under these critical conditions. Classification is based on one of the following conditions: the space cannot be ventilated sufficiently to produce an oxygen content above 16 percent and/or reduce the toxic and flammable conditions below the IDLH limits. Respiratory protection is required when entering a Class A confined space.

(b) Entry into a Class B or Class C space is allowed provided the proper precautions have been taken prior to entry into the space.

2. Entry into a confined space shall not be allowed until an authorization and approval in writing has been issued. This authorization shall be called a "permit".

(a) The permit shall be signed and dated by the qualified person, specify the location and type of work to be performed, and certify that the existing hazards have been evaluated and protective measures implemented to insure the safety of each person entering the confined space. A sample permit is shown in Appendix I and may serve as a guide. This document or a similar document that contains the same information must be completed prior to entry into a confined space.

(b) The permit must specify that the following areas and actions have been reviewed and confirmed.

(1) Location and description of the work to be done.

(2) Hazards that may be encountered.

(3) Isolation checklist has been completed:

A. Blanking and/or disconnecting.

B. Electrical and/or mechanical lockout.

(4) Special clothing and equipment obtained:

A. Personal protective equipment and clothing.

B. Safety harness and/or lifelines.

C. Tools approved for use in accordance with the Hazardous Location Classification (NEC-1078) obtained.

D. Approved electrical equipment obtained.

(5) Atmospheric testing has been conducted for:

A. Oxygen level.

B. Flammability and/or explosive levels.

C. Toxic substances levels.

(6) Atmospheric monitoring while work is being performed:

A. On continuous basis.

B. As determined by the qualified person.

(7) Personnel training completed with complete understanding of the hazards and the work to be accomplished within the space.

(8) Attendant person(s) named.

(9). Emergency procedures established and location of first aid equipment identified.

(10) Determination of confined space classification as Class A, B, or C.

(11) Name of person entering space with time in and out.

(c) The permit shall be valid for one work shift only. If the work to be accomplished takes longer than one work shift, then the conditions must be re-evaluated, the permit updated if necessary, and then reissued.

(d) The permit shall be posted in a conspicuous place close to the entrance to the confined space while the work is ongoing.

(e) Upon completion of work, the permit is filed for three years.

3. Work procedures for the work to be performed within the confined space shall be established prior to entering the space.

(a) The number of employees needed to perform the work and the equipment and tools needed shall be determined.

b. Protective equipment needed shall be identified and obtained. Respiratory protection is required for a Class A space.

(c) The need to ventilate the space shall be determined and the space purged with sufficient fresh air to reduce the levels of contaminants to an acceptable limit. Any activities which may alter the oxygen content in the space shall be determined and provisions made to ensure that the activities in the space do not create an IDLH atmosphere while employees are working within the space.

(d) Any equipment in the space, whether operating or not, shall be isolated, locked and tagged out, so that it cannot be reactivated while people are within the confined space.

(e) Communications between the people inside the confined space and the support people outside the space shall be established.

(f) One person shall be designated as the **attendant**.

(1) The **attendant** shall control the entry and exit of employees within the confined space.

(2) The **attendant** will continuously observe conditions within the confined space and coordinate the communications between the people within the confined space and outside the space.

(3) The **attendant** shall summon the rescue team when upon observation of conditions inside the confined space, a rescue is necessary.

(4) At no time shall the **attendant** attempt to rescue people by entering the confined space.

(g) Rescue procedures shall be established, and respiratory protection for rescue personnel must be readily available within the immediate area of the confined space. Rescue of employees from the confined space must not be attempted unless the rescue personnel are properly equipped with respiratory protection in the form of self-contained breathing apparatus or supplied air mask. Rescuers should be prepared for atmospheres on level above the one indicated on the permit.

d. Rescue Procedures.

1. Each site having confined spaces shall determine whether to rely on an in-house rescue

team or to establish an arrangement with an outside rescue team which will respond to a request for emergency services. The outside rescue team may be obtained through the use of "911" emergency services where available or through the local fire department.

(a) The **attendant** shall monitor operations inside the confined space and summon the rescue team when required. At no time shall a rescue requiring entry into the confined space be attempted by the **attendant** or other non-qualified person at the site. Multiple fatalities have occurred in confined spaces because a rescue was attempted by non qualified and trained personnel. Remember, a "dead hero" is not a hero.

(b) If an in-house rescue team is used, provisions shall be made to ensure that:

(1) The personnel assigned to the rescue team are provided with the personal protective equipment, including respiratory protection (self-contained breathing apparatus or air supplied mask), necessary for making rescues from the confined spaces at the site, and are trained in the use of the respiratory protection. Rescue team protection must exceed worker protection.

(2) The in-house rescue team is readily available to be summoned whenever work is scheduled inside a confined space.

(3) The in-house rescue team is trained to perform rescue operations and has received the same training as those employees who have been authorized to enter the confined space to perform the work.

(4) The in-house rescue team must practice making rescues from confined spaces at least once per year. The practice rescue must simulate rescue conditions and use dummies, mannequins or personnel in a simulated rescue operation. The simulated rescue conditions shall approximate as closely as possible the conditions that would exist at the site in a confined space, including the size of openings and configuration of a confined space.

(5) At least one member of the in-house rescue team, and preferably two members, must be trained and maintain current certification by the American Red Cross in basic first-aid and cardiopulmonary resuscitation (CPR) skills.

(6) The number of members of the rescue team that enter the confined space to rescue the injured employees will depend on the number of employees to be rescued. If only one person needs rescue, only one member of the rescue team shall enter the confined space. Any additional members of the rescue team will remain outside the confined space and assist the rescue operation, and will enter the confined space only if additional help is summoned by the first rescue team member.

(c) If an outside rescue team is used, the site manager must ensure that the designated rescuers are aware of the hazards that might be encountered during

a rescue operation at the site. Confined space entry can only occur if the local team can provide emergency support.

e. Medical Surveillance.

1. A medical surveillance program shall be established for all employees who, Within the scope of their work assignments and duties, enter into and work within Class A or B confined spaces.

2. The medical surveillance program shall consist of a pre-placement medical examination and a periodic (yearly) medical examination for all employees who enter and work within confined spaces. The medical examination shall include:

   (a) A general evaluation of the employee's health and the detection of any diseases or abnormalities that would make it difficult for the employee to work within confined spaces.

   (b) An evaluation of the employee's ability to use and wear negative and positive pressure respirators while performing work.

   (c) A hearing exam, a vision test and an evaluation of the employee's ability to hear and see warning lights and signals, such as flashing lights, buzzers, and sirens.

3. Prior to conducting the medical examination, the attending physician shall receive a description of the type of confined space the employee may be required to enter, the type of substances that may be encountered, and the type of protective equipment, including respirators, that may be required to be worn.

4. Following completion of the medical examination, the attending physician shall provide a written report to the site manager. The report shall specify the general condition of the employee's health and whether the employee may continue to work within confined spaces without an increased risk to the employee's health.

5. All details of the physician's reports to the site manager must be kept confidential.

f. Training.

1. Training must cover the duties of the three categories of workers involved in confined space work: entrants, attendants, and individuals in charge of entry or responsible for authorizing permits. Refer to Rescue Protection for rescue team training requirements.

   (a) Entrants training must cover hazard recognition, communications procedures, protective equipment and self rescue.

   (b) Attendant training must include the procedures used to keep account of entrants, hazard recognition, communications techniques, and rescue methods.

   (c) Qualified persons are required to be trained in calibrating and using monitoring equipment, determining appropriate engineering methods to remediate the hazards, determining the severity of the hazards, developing an entry plan, training entrants and attendants.

(d) Individuals may be trained in several worker categories. On the job site an individual will perform only one function except the qualified person can be an entrant or an attendant.

2. Training should be documented on employee safety and health record or documents used for safety training.

g. Recordkeeping. Records must be retained for the following time periods:

1. Atmospheric tests - 5 years.

2. Training - 3 years.

3. Permits - 3 years.

4. Medical examinations - 25 years.

5. Monitoring data - 25 years, if at or above the Action Level.

04. INSTRUMENTS

a. Supervisors shall ensure testing and monitoring equipment used in confined spaces is approved for use in Class 1, Division 1 locations.

b. Only direct reading equipment with current calibration will be used.

c. Equipment should meet certifications by Underwriters Laboratories (UL), factory mutual (FM), or a similar nationally recognized test laboratory.

d. Group classification is provided in National Fire Protection Association (NFPA) 497M, Manual for Classification of Gases, Vapors, and Dust for Electrical Equipment in Hazardous Locations. Guidance is also provided in National Materials Advisory Board (NMAB) 353-5, Classification of Gases, Liquids and Volatile Solids Relative to Explosion-proof Electrical Equipment.

e. Equipment should be kept calibrated. The user shall field check equipment according to the manufacturer's instructions immediately before testing the confined space atmosphere.

f. Monitoring instruments which cannot be calibrated or which fail the field check will be removed from service. Equipment will be returned to service after repairs are completed and the calibration and field check are successfully accomplished.

g. Instruments used for evaluating confined spaces are:

1. Oxygen sensors.

2. Explosive meters.

3. Toxic chemical detectors.

4. Multipurpose personal monitors.

05. HOTWORK

a. The supervisor will ensure the proper fire-fighting equipment is available and ready to use whenever hot riveting, welding, cutting, brazing, or heating operations occur within a confined space. The supervisor will ensure that local emergency medical services is informed of confined space project and hot work operation.

b. Inspect, test, operate and maintain welding and cutting equipment such as hoses, connections, torches, and manifolds according to industry practices and OSHA standards.

c. Gas cylinders and manifolds used in welding and cutting operations and electric arc units or machines must remain outside of the confined space at all times.

d. Turn off gas supplies at the cylinders or manifold outside the space when equipment is unattended or unused for substantial periods of time, such as breaks or lunch periods. Turn off gas supplies and remove torches and hoses from the space at shift changes (30 minutes or more) or overnight. Torches should be disconnected from the hoses when not in use.

06. PURGING/VENTILATION

a. When initial testing indicates that ventilation is required to remove dedicated contaminant and/or provide adequate oxygen levels, the supervisor will ensure ventilation is provided during entry and occupancy of the space.

b. Operations to be conducted inside the confined space have the potential to cause an Immediately Dangerous to Life or Health (IDLH) atmosphere without industrial ventilation, the supervisor will ensure ventilation (general dilutions or local exhaust is used to maintain the atmosphere within the space).

c. Ventilation equipment should have approved Ground Fault Interrupter (GFI) protection and, if equipment is to be in a Class A or B environment, it should be protected by explosion-proof fixtures in accordance with the National Fire Prevention Administration (NFPA).

07. LOCKOUT/ISOLATION

a. The lockout/tagout procedures should be in the planning phase of all confined space operations.

b. Procedures should be followed in accordance with OSHA regulations.

c. All personnel performing in the confined space operation project should be informed and trained in the lockout/tagout program.

08. CONTRACTOR INVOLVED IN CONFINED SPACE ENTRY

a. Prior to awarding a contract, contract review should evaluate the confined space entry program for compliance with OSHA regulations or state safety and health standards.

b. Contractors should post the area and provide barricades if necessary. Their project should not damage DOC property or injure DOC personnel.

CHECK LIST OF CONSIDERATIONS FOR ENTRY, WORKING IN AND EXITING CONFINED SPACES

ITEM	CLASS A	CLASS B	CLASS C
1. Permit	X	X	X
2. Atmospheric Testing	X	X	X
3. Monitoring	X	0	0
4. Medical Surveillance	X	X	0
5. Training of Personnel	X	X	X
6. Labeling and Posting	X	X	X
7. Preparation			
Isolate/lockout/tag	X	X	0
Purge and ventilate	X	X	0
Cleaning Processes	0	0	0
Requirements for special equipment/tools	X	X	0
8. Procedures			
Initial plan	X	X	X
Standby	X	X	0
Communications/observation	X	X	X
Rescue	X	X	X
Work	X	X	X
9. Safety Equipment and Clothing			
Head protection	0	0	0
Hearing protection	0	0	0
Hand protection	0	0	0
Foot protection	0	0	0
Body protection	0	0	0
Respiratory protection	0	0	
Safety Belts	X	X	X
Life lines, harness	X	0	
10. Rescue Equipment	X	X	X
11. Recordkeeping/Exposure	X	X	

X - indicates requirement
0 - indicates determination by the qualified person

CONFINED SPACE ENTRY PERMIT

INITIAL CERTIFICATION	TEST RESULTS

ACTIVITY ADDRESS:

TYPE OF OPERATION TO BE CONDUCTED:

DESCRIBE CONFINED SPACE:

INITIAL DATE OF TEST:
HOUR _____ DATE _____

INITIAL EXPIRATION:
HOUR _____ DATE _____

TESTS CONDUCTED AS REQUIRED	PEL	INITIAL TEST	RETEST 1	RETEST 2
OXYGEN				
COMBUSTIBLE GAS				
TOXIC TYPE:				
TOXIC TYPE:				
TOXIC TYPE:				
TOXIC TYPE:				

VENTILATION REQUIRED: YES NO
TYPE:

ENTRANTS: TIME:

IN _____ OUT _____
IN _____ OUT _____
IN _____ OUT _____

HOTWORK

LOCATIONS	NAME	SIGNATURE* (UPON COMPLETION)

NOTE: THIS INSPECTION INDICATES THE CONDITIONS WHICH EXISTED AT THE TIME TESTS WERE CONDUCTED.

QUALIFIED PERSON SIGNATURE: _____

RECERTIFICATION

1ST RETEST/UPDATE

TIME: _____ DATE: _____ EXPIRES: _____

QUALIFIED PERSON SIGNATURE: _____

2ND RETEST/UPDATE

TIME: _____ DATE: _____ EXPIRES: _____

QUALIFIED PERSON SIGNATURE: _____

TIME COMPLETED: _____

* FINAL CHECKUP: WORK AREA AND ALL ADJACENT AREAS TO WHICH SPARKS & HEAT MIGHT SPREAD WERE INSPECTED 30 MIN. AFTER THE WORK WAS COMPLETED AND WERE FOUND TO BE FIRE SAFE. THE EQUIP. AND STRUCTURES WORKED ON WERE COOL TO THE TOUCH.

I CERTIFY THAT I AM FAMILIAR WITH AND WILL COMPLY WITH ALL SAFETY PRECAUTIONS PERTINENT TO THIS TYPE OF WORK.

HOTWORK OPERATOR SIGNATURE _____
HOTWORK SUPERVISOR _____

PERMIT TERMINATION

THIS CERTIFIES THAT ALL ENTRANTS HAVE VACATED THIS SPACE. THIS PERMIT IS VOID

ATTENDANT SIGNATURE _____

TIME: _____ **DATE:** _____

CHAPTER 17

INFECTIOUS WASTE

01. POLICY AND DISCUSSION:

The purpose of this chapter is to provide information to Department of Commerce employees who work with potentially infectious agents. The chapter includes specific precautions and procedures designed to eliminate or control the hazards.

Increasing attention is being directed toward safety as more workers are exposed to potentially infectious wastes. Exposure to these agents may pose special disease risks to workers in research laboratories, health care settings, and animal handling facilities. Disease may include Hepatitis B (HBV), Tuberculosis (TB), and Acquired Immunodeficiency Syndrome (AIDS). The route of these infections can vary, from inhalation of an aerosol, to ingestion, to injection with a contaminated needle. The focus must be on prevention of these infections through the practice of containment and other requirements of this document.

The requirements of this chapter apply to all Department of Commerce activities that involve work with biohazardous agents. Operating units must adopt similar or more stringent regulations.

02. ELEMENTS OF CONTAINMENT:

The purpose of containment is to eliminate/minimize personnel exposure to biohazardous agents and the escape of these agents into the environment.

Protection of personnel and the immediate environment is considered primary containment, and is achieved by good working techniques and the proper use of equipment.

Secondary containment is protection of environment outside biohazardous sites and is provided by a combination of operational practices and facility design. Three elements of containment are:

a. **Laboratory Practice and Technique.** Strict adherence to standard practice and techniques is required to prevent contact with biohazardous agents. Typical incidents include spills or sprays; incidents involving needles, syringes, contaminated glass or other sharp objects; aspiration through pipettes; and bites or scratches of animals. Minimizing/eliminating the potential for these and other laboratory accidents when handling biohazardous agents can be achieved by:

   1. Limiting laboratory access when experiments involving biologicals/infectious agents are in progress;

   2. Posting a warning sign (see Figure #1) on the access door incorporating the international biohazard symbol when infectious agents are in use and require special provisions for entry.

      (a) The sign shall name the agent, the name and telephone number of the responsible supervisor, and any requirements for entering the lab (protective

equipment, immunizations).

(b) The sign is appropriate for use on freezers, refrigerators, and other approved storage medium housing biohazardous material.

3. Procedures shall be performed carefully to minimize the creation of aerosols. Enclosure of equipment and isolation of aerosol producing processes will serve to control the spread of aerosols.

4. Work surfaces shall be decontaminated once a day and after any spill, viable or potentially infectious biohazard.

5. Mechanical pipetting devises shall be used. Mouth pipetting is prohibited.

6. Consideration shall be given to the use of plastic items, blunt ends needles, rounded scissors, etc., for lab use with biohazardous agents to minimize "sharps".

7. Use of needles and syringes should be limited to situations in which there is no alternative. Needle-locking hypodermic syringes should be used whenever possible. Use of syringes for making dilutions is to be discouraged.

8. Use of alcohol-soaked gauze pad around the needle when removing the syringe and needle from a rubber-stoppered bottle will minimize aerosol production. Needles should be disposed of immediately after use and never left where they can cause injury to others.

9. Keep needle and syringe units intact (never recap, break or bend needles) and dispose of in a puncture resistant, leak proof container kept as close as practical to the use area.

NOTE: Especially designed containers for needles, scalpels, and other sharps contaminated with biohazardous materials are available and may be obtained with assistance from your Operating Unit Safety Representative, Regional Safety Manager, or Area Safety Representative. Use of the specially designed containers is required.

10. Needles, scalpels and other "sharps" used with non-biohazardous or non-infectious materials shall be disposed of in approved sharps containers.

11. For disposal purposes, only those needles, syringes, and sharps exposed to infectious material shall be processed as biohazardous waste. Items used in laboratory analysis and not exposed to infectious material shall be disposed of in accordance with State or Federal regulations for the disposal of such material.

12. Before centrifuging, check tubes for damage. Never over-fill centrifuge with tubes.

13. Hand to face contact must be minimized. Eating, drinking, chewing gum or tobacco and applying cosmetics shall be prohibited in rooms where biohazardous materials are used.

14. Wash hands thoroughly after handling biohazardous materials and before leaving the laboratory or other biohazardous materials environment. Soap shall be of the

dispensed liquid gel variety to eliminate the spread of infectious agents possible with bar soap.

15. Spills shall be taken care of promptly and properly.

16. Biohazardous materials shall be stored only in specially designated areas such as properly labeled refrigerators, freezers or incubators. There shall be limited access to these areas and log books shall be maintained for each.

17. Cabinets or refrigerators storing biohazardous materials shall not be used for the storage of food. Food shall only be stored outside of the work area.

18. Decontaminate all non-disposable contaminated materials before washing, reusing, repairing, or removing, typically by chemical disinfection (See Attachment A) or steam sterilization (autoclaving). Autoclaving is time and temperature dependent, and appropriate indicators must be used to ensure sterilization has taken place.

19. Biohazardous agents transported outside the designated environment shall be transported in an impermeable, unbreakable, leak proof, labeled container.

b. **Safety Equipment (Primary Barriers).** Biological Safety Cabinets (BSCS) are the principal devices of containment. Three classes of cabinets (I, II ,III) are available, with Class III offering the highest level of protection. When used with the work practices previously described, these cabinets offer significant levels of protection to personnel and the environment by isolating the hazard and containing the spills, splashes and aerosols.

In situations where cabinet work is not possible, personal protective equipment may be the primary barrier between biohazardous agents and personnel. Their use is required whenever hazards that are capable of causing injury through inhalation, absorption or contact. These devices are often used in conjunction other primary barriers. Double gloving should be considered, as appropriate. Face shields shall be worn during procedures that have the potential for generating splashes.

c. **Facility Design (Secondary Barrier).** Facility design is crucial in protecting personnel who work in and outside the lab, as well as those within the community. Facility designs, in ascending order by level of containment, are described below.

Design 1. The basic site provides general space where work is done with viable materials not associated with disease in healthy adults and/or work is done with infectious or potentially infectious materials when hazard levels are low and good lab techniques prevail; work is usually done on the open bench, but certain procedures are restricted to biological safety cabinets.

Design 2. The containment site includes special engineering controls that allow workers to handle infectious materials without presenting hazards to personnel, the environment, or the community; site is separated from public areas by a controlled access zone; a specialized ventilation system is present; vacuum line filters/disinfectant traps are used between the line and the operation to prevent contamination of the vacuum system.

Design 3. The maximum containment site, it has containment and engineering features that allow work with extremely hazardous, infectious materials capable of causing serious disease; often a separate building; secondary barriers are required, such as airlocks,

shower and change room, separate ventilation system, exhaust air decontamination system, and waste treatment system.

03. BIOSAFETY LEVELS

Biosafety Level 1 covers work done with defined agents not known to cause disease in healthy human adults. A representative of agents assigned to this level is **bacteria.**

Biosafety Level 2 contains work with indigenous, moderate-risk materials associated with human disease of varying severity. Primary hazards to personnel may include skin or mucous membrane exposure, ingestion and accidental inoculation. High aerosol-potential procedures must be confined to a Biohazardous Safety Cabinet. **Food poisoning and HBV and HIV virus** are assigned to this containment level.

Biosafety Level 3 techniques, equipment and facilities apply to clinical, teaching, diagnostic, research or production facilities where work is with exotic agents. Potential for infection by aerosols, ingestion or autoinoculation is real and may result in serious or lethal disease. **Tuberculosis** falls within this level.

Biosafety Level 4 covers work with exotic and dangerous agents with high risk of exposure and infection resulting in life-threatening disease. All manipulations present a high exposure risk.

04. MEDICAL UNIT ACTIVITIES

Rubber gloves shall be worn by all medical unit staff members who come in direct contact with patients, dressings, bandages or clothing containing a patients blood or serum.

Syringes and needles used in the administration of allergy injections shall be disposed of in a puncture-proof/leak-proof container. The container shall be located in the immediate area where the injections are administered.

Contaminated materials shall be disposed of either by autoclaving or by incineration, as appropriate.

05. MEDICAL SURVEILLANCE

Medical evaluation and surveillance shall be provided for groups of employees whose work requires them to perform tasks with a potential for skin or mucous membrane contact with blood, blood products, body fluids or human tissue. Surveillance consists of biennial physical examination and an annual blood screening for HBV antibodies.

In addition HBV immunization shall be offered to all workers exposed to blood/tissue who test negative for HBV antibodies. Screening and immunization costs shall be borne by the operating unit to which the employee is assigned.

Supervisors of groups described above but not currently in the medical surveillance program should be advised to contact their operating Unit Safety Representative, their Area Safety Representative or their Regional Safety Manager to discuss inclusion into the program.

06. PATIENT CARE

The Center for Disease Control (CDC) has published a report entitled "Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, and other Bloodborne Pathogens in Health-Care Settings". A copy of CDC's report is attached and shall be implemented by all Department of Commerce Health Units and Fire Protection Services in the course of patient care.

07. PACKAGING/SHIPPING

a. Packaging, labeling and shipping shall be in accordance with applicable Federal, state or local regulations and shall be coordinated with the site safety representative.

b. At a minimum, bandages, swabs and other disposable potentially biohazardous materials shall be placed inside a double plastic bag, each of at least .6 mil of thickness.

c. Each plastic bag shall be closed using a heavy duty tape (duct tape) and fastened so that the bag and its cargo is secure.

08. EMERGENCY PROCEDURES

a. Spills. Each site supervisor in which biohazardous materials are used or stored shall develop a material-specific plan for handling spills. Stock solutions of appropriate disinfectant shall be maintained at each area housing biohazardous material. In case of an accident outside a Biological Safety Container resulting from breakage or spillage, affected employees shall:

1. Remove any contaminated clothing and change into emergency clothing maintained in the lab;

2. Leave the room closing the door;

3. Warn others of the hazard; and

4. Notify their supervisor and the site safety representative.

If the agent is infectious or potentially infectious, the appropriate Emergency Control Center (site, County or State) must be notified in a timely manner. Work in the laboratory shall be suspended and decontamination performed prior to reoccupancy or continuation of work. Clean-up or decontamination plans shall be developed by the supervisor of the laboratory and a copy provided to the Safety Representative.

b. Accidental Exposure. An employee who is accidentally exposed to an infectious agent shall immediately report the incident to their immediate supervisor. In the event that a substance enters the mouth, eyes, lungs or penetrates or comes in contact with the skin, the supervisor shall direct disinfecting procedures and see that the employee reports for medical treatment immediately. The Medical Officer or designee will take appropriate action to provide medical evaluation, surveillance and treatment as needed.

09. INFECTIOUS WASTE CONTROL AND DISPOSAL

a. Waste biohazardous items and contaminated disposable material (culture dishes, gloves,

aprons and devices used to transfer, inoculate or mix, etc.) shall be handled and disposed of with special precautions. Biohazardous wastes with multiple hazards (radioactivity, toxicity, etc.) shall be segregated by the generator for individual evaluation.

b. All biohazardous waste shall be contained from the point of origin to the point where it is no longer hazardous (disposal by incineration).

c. The integrity of packaging is critical to ensure containment of waste during collection, storage and transportation. **All** sharps for disposal must be placed in approved sharps containers. **All** other nonradioactive, non-chemical biohazardous waste shall be in leak proof plastic bags of at least .6 mil thickness.

d. Storage temperature and duration of storage are important considerations in the handling of biohazardous waste. It may be necessary for the generator of the waste to temporarily and securely store the waste until disposal arrangements have been made.

10. SUPERVISORY RESPONSIBILITIES

a. It is the responsibility of each employee working with biohazardous agents to read and acknowledge understanding of this chapter. Refresher training, which includes the contents of this Chapter shall be conducted at least annually thereafter.

b. The supervisor of any project that will result in the generation, use, handling, or storage of biohazardous agents is responsible for the following:

1. Completing the Biohazard Registration and forwarding it to their Safety Official, prior to initiating a project. Projects already in progress shall be registered without delay. Receipt of completed registration forms will allow the Safety Office to review the project for potential biohazard, and aid in obtaining medical surveillance, etc.;

2. Establishing a detailed, material-specific Standard Operating Procedure for all tasks or areas having the potential for exposure to biohazards, including spill, personnel exposure, decontamination and waste handling procedures and protective equipment required;

3. Providing initial orientation and continuing education of all personnel on the biohazardous agents, proper work practices, and operation and maintenance of containment devises and personal protective equipment;

4. Ensuring that affected employees are notified of the offer to participate in the medical; surveillance, screening and/or vaccination program; and

5. Minimizing biohazardous waste generation and ensuring proper segregation/ packaging of waste for disposal.

APPENDIX A

COMMON CHEMICAL DECONTAMINANTS

Type	Proprietary Examples
Quaternary Ammonium Compounds	Micro-Quat, End-Bac, CDQ
Phenolic Compounds	Micro-Bac, Matar, Hil-Phene
Chlorine Compounds	Chlorox, Purex, Chloramine T
Formaldehyde	Sterac
Glutaraldehyde	Cidex
Alcohol, Ethyl	
Alcohol, Isopropyl	

Effective chemical disinfection is dependent on type of microorganism, degree of contamination, amount contaminated material present, contact time, temperature, pH, and type, concentration and quantity of decontaminant. Definitive data regarding the effectiveness of a particular decontaminant should be individually determined for test organisms and conditions, although a 30-minute minimum time is generally effective.

All chemical decontaminants are considered toxic, and may cause eye and skin irritation. Read the product label and take precautions appropriate to the hazard.

Items decontaminated with chlorine bleach should be neutralized with a 0.3 percent solution of sodium thiosulfate if they are to be steam sterilized (autoclaved) to prevent release of chlorine gas.

APPENDIX B
MORBIDITY AND MORTALITY WEEKLY REPORT

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WEEKLY REPORT

PERSPECTIVES IN DISEASE PREVENTION AND HEALTH PROMOTION

Update: Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, or Other Bloodborne Pathogens in Health-Care Settings

Introduction

The purpose of this report is to clarify and supplement the CDC publication entitled "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (*1*).

In 1983, CDC published a document entitled "Guideline for Isolation Precautions in Hospitals" (*2*) that contained a section entitled "Blood and Body Fluid Precautions." The recommendations in this section called for blood and body fluid precautions when a patient was known or suspected to be infected with bloodborne pathogens. In August 1987, CDC published a document entitled "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (*1*). In contrast to the 1983 document, the 1987 document recommended that blood and body fluid precautions be consistently used for all patients regardless of their bloodboorne infection status. This extension of blood and body fluid precautions to **all** patients is referred to as, "Universal Blood and Body Fluid Precautions" or "Universal Precautions." Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other bloodborne pathogens.

The August 1987 publication should be consulted for general information and specific recommendations not addressed in this update.
Copies of this report and of the MMWR supplement entitled Recommendations for Prevention of HIV Transmission in Health Care Settings published in August 1987 are available through the National AIDS Information Clearinghouse, P.O. Box 6003,
Rockville, MD 20850.

Update: HIV - Continued Universal precautions intended to prevent parenteral, mucous membrane, and nonintact skin exposures of health care Workers to bloodborne pathogens. In addition, immunization with HBV vaccine is recommended as important adjunct for health-care workers who are exposed to blood (*3,4*).

Since the recommendations for universal precautions were published in August 1987, CDC and the Food and Drug Administration (FDA) have received requests for clarification of the following issues: 1) body fluids to which universal precautions apply, 2) use of protective barriers, 3) use of gloves for phlebotomy, 4) selection of gloves for use while observing universal precautions, and 5) need for making changes in waste management programs as a result of adopting universal precautions.

Body Fluids to Which Universal Precautions Apply

Universal precautions apply to blood and to other body fluids containing visible blood. Occupational transmission of HIV and HBV to health-care workers by blood is documented (*4,5*). **Blood is the single most important source of HIV, HBV, and other bloodborne pathogens in the occupational setting. Infection control efforts for HIV, HBV, and other bloodborne pathogens must focus on preventing exposures to blood as well as on delivery of HBV immunization.**

Universal precautions also apply to semen and vaginal secretions. Although both of these fluids have been implicated in the sexual transmission of HIV and HBV, they have not been implicated in occupational transmission from patient to health-care worker. This observation is not unexpected, since exposure to semen in the usual health-care setting is limited, and the routine practice of wearing gloves for performing vaginal examinations protects health-care workers from exposure to potentially infectious vaginal secretions.

Universal precautions also apply to tissues and to the following fluids: cerebrospinal fluid (CSF), synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid. The risk of transmission of HIV and HBV from these fluids is unknown; epidemiologic studies in the health-care and community setting are currently inadequate to assess the potential risk to health-care workers from occupational exposures to them. However, HIV has been isolated from CSF, synovial, and amniotic fluid (*6-8*), and HBsAG has been detected in synovial fluid, amniotic fluid, and peritoneal fluid (*9-11*). One case of HIV transmission was reported after a percutaneous exposure bloody pleural fluid obtained by needle aspiration (*12*). Whereas aseptic procedures used to obtain these fluids for diagnostic or therapeutic purposes protect health-care workers from skin exposures, they cannot prevent penetrating injuries due to contaminated needles or other sharp instruments.

Body Fluids to Which Universal Precautions Do Not Apply

Universal precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomitus unless they contain visible blood. The risk of transmission of HIV and HBV from these fluids and materials is extremely low or nonexistent. HIV has been isolated and Hbsag has been demonstrated in some of these fluids; however, epidemiologic studies in the health-care and community setting have not implicated these fluids or materials in the transmission of HIV and HBV infections (*13,14*). Some of the above fluids and excretions represent a potential source for nosocomial and community-acquired infections with other pathogens, and recommendations for preventing the transmission of nonbloodborne pathogens have been published (*2*).

Update: HIV - Continued

Precautions for Other Body Fluids in Special Settings

Human breast milk has been implicated in perinatal transmission of HIV, and Hbsag has been found in the HBV (*10,13*). However, Hbsag has been found in the milk of mothers infected with HBV (10,13). However, occupational exposure to human breast milk has not been implicated in the transmission of HIV or HBV infections to health-care workers. Moreover, the health-care worker will not have the same type of intensive exposure to breast milk as the nursing neonate. Whereas universal precautions do not apply to human breast milk, gloves may be worn by health-care workers in situations where exposures to breast milk may be worn breast milk may be frequent, for example, in breast milk banking. in HBV-DNA at Saliva of some

Saliva of some persons infected with HBV has been shown to contain HBV-DNA at concentrations 1/1,000 to l/lO,OOO of that found in the infected person's serum (*15*) HBsAg-positive saliva has been shown to be infectious when injected into experimental animals and in human bite exposures (*16-18*). However, HBsAg-positive saliva has not been shown to be infectious when applied to oral mucous membranes in experimental primate studies (*18*) or through contamination of musical instruments or cardiopulmonary resuscitation dummies used by HBV carriers (*19,20*). Epidemiologic studies of nonsexual household contacts of HIV-infected patients, including several small series in which HIV transmission failed to occur after bites or after percutaneous inoculation or contamination of cuts and open wounds with saliva from HIV-infected patients, suggest that the potential for salivary transmission of HIV is remote (*5,13,14,21,22*). One case report from Germany has suggested the possibility of transmission of HIV in a household setting from an infected child to a sibling through a human bite (*23*). The bite did not break the skin or result in bleeding. Since the date of seroconversion to HIV was not known for either child in this case, evidence for the role of saliva in the transmission of virus is unclear (*23*). Another case report suggested the possibility of transmission of HIV from husband to wife by contact with saliva during kissing (*24*). However, follow-up studies did not confirm HIV infection in the wife (*21*).

Universal precautions do not apply to saliva. General infection control practices already in existence - including the use of gloves for digital examination of mucous membranes and endotracheal suctioning, and handwashing after exposure to saliva - should further minimize the minute risk, if any, for salivary transmission of HIV and HBV (*1,25*). Gloves need not be worn when feeding patients and when wiping saliva from skin.

Special precautions, however, are recommended for dentistry (*1*). Occupationally acquired infection with HBV in dental workers has been documented (*4*), and two possible cases of occupationally acquired HIV infection involving dentists have been reported (*5,26*). During dental procedures, contamination of saliva with blood is predictable, trauma to health-care workers' hands is common, and blood spattering may occur. Infection control precautions for dentistry minimize the potential for nonintact skin and mucous membrane contact of dental health-care workers to blood-contaminated saliva of patients. In addition, the use of gloves for oral examinations and treatment in the dental setting may also protect the patient's oral mucous membranes from exposures to blood, which may occur from breaks in the skin of dental workers' hands.

Use of Protective Barriers

Protective barriers reduce the risk of exposure of the health-care worker's skin or mucous membranes to potentially infective materials. For universal precautions, protective barriers

reduce the risk of exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions apply. Examples of protective barriers include gloves, gowns, masks, and protective eye wear. Gloves should reduce the incidence of contamination of hands, but they cannot prevent penetrating injuries due to needles or other sharp instruments. Masks and protective eye wear or face shields should reduce the incidence of contamination of mucous membranes of the mouth, nose, and eyes.

Universal precautions are intended to supplement rather than replace recommendations for routine infection control, such as handwashing and using gloves to prevent gross microbial contamination of hands (27). Because specifying the types of barriers needed for every possible clinical situation is impractical, some judgment must be exercised.

The risk of nosocomial transmission of HIV, HBV, and other bloodborne pathogens can be minimized if health-care workers use the following general guidelines:

1. Take care to prevent injuries when using needles, scalpels, and other sharp instruments or devices; when handling sharp instruments after procedures; when cleaning used instruments; and when disposing of used needles. Do not recap used needles by hand; do not remove used needles from disposable syringes by hand; and do not bend, break, or otherwise manipulate used needles by hand. Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture-resistant containers for disposal. *Locate the puncture-resistant containers as close to the use area as is practical.*

2. Use protective barriers to prevent exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions apply. The type of protective barrier(s) should be appropriate for the procedure being performed and the type of exposure anticipated.

3. Immediately and thoroughly wash hands and other skin surfaces that are contaminated with blood or other body fluids to which universal precautions apply.

Glove Use for Phlebotomy

Gloves should reduce the incidence of blood contamination of hands during phlebotomy (drawing blood samples), but they cannot prevent penetrating injuries caused by needles or other sharp instruments. The likelihood of hand contamination with blood containing HIV, HBV, or other bloodborne pathogens during phlebotomy depends on several factors: 1) the skill and technique of the health-care worker, 2) the frequency with which the health-care worker performs the procedure (other factors being equal, the cumulative risk of blood exposure is higher for a health-care worker who performs more procedures), 3) whether the procedure occurs in a routine or emergency situation (where blood contact may be more likely), and 4) the prevalence of infection with bloodborne pathogens in the patient population. The likelihood of infection after skin exposure to blood containing HIV or HBV will depend on the concentration of virus (viral concentration is much higher for hepatitis B than for HIV), the duration of contact, the presence of skin lesions on the hands of the

health-care worker, and - for HBV - the immune status of the health-care worker. Although not accurately quantified, the risk of HIV infection following intact skin contact with infective blood is certainly much less than the 0.5% risk following percutaneous

The August 1987 publication should be consulted for general information and specific recommendations not addressed in this update.

needle stick exposures (*5*). In universal precautions, **all** blood is assumed to be potentially infective for bloodborne pathogens, but in certain settings (e.g., volunteer blood-donation centers) the prevalence of infection with some bloodborne pathogens (e.g., HIV, HBV) is known to be very low. Some institutions have relaxed recommendations for using gloves for phlebotomy procedures by skilled phlebotomists in settings where the prevalence of bloodborne pathogens is known to be very low.

Institutions that judge that routine gloving for all phlebotomies is not necessary should periodically reevaluate their policy. Gloves should always be available to health-care workers who wish to use them for phlebotomy. In addition, the following general guidelines apply:

1. Use gloves for performing phlebotomy when the health-care worker has cuts, scratches, or other breaks in his/her skin.
2. Use gloves in situations where the health-care worker judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative patient.
3. Use gloves for performing finger and/or heel sticks on infants and children.4. Use gloves when persons are receiving training in phlebotomy.

Selection of Gloves

The Center for Devices and Radiological Health, FDA, has responsibility for regulating the medical glove industry. Medical gloves include those marketed as sterile surgical or nonsterile examination gloves made of vinyl or latex. General purpose utility ("rubber") gloves are also used in the health-care setting, but they are not regulated by FDA since they are not promoted for medical use. There are no reported differences in barrier effectiveness between intact latex and intact vinyl used to manufacture gloves. Thus, the type of gloves selected should be appropriate for the task being performed.

The following general guidelines are recommended:

1. Use sterile gloves for procedures involving contact with normally sterile areas of body.
2. Use examination gloves for procedures involving contact with mucous membranes, unless otherwise indicated, and for other patient care or diagnostic procedures that do not require the use of sterile gloves.
3. Change gloves between patient contacts.
4. Do not wash or disinfect surgical or examination gloves for reuse. Washing with surfactants may cause "wicking," i.e., the enhanced penetration of liquids through undetected holes in the glove. Disinfecting agents may cause deterioration.
5. Use general purpose utility gloves (e.g., rubber household gloves) for housekeeping chores involving potential blood contact and for instrument cleaning and decontamination procedures. Utility gloves may be decontaminated and reused but should be discarded if they are peeling, cracked, or discolored, or if they have punctures, tears, or other evidence of deterioration.

Waste Management

Universal precautions are not intended to change waste management programs previously recommended by CDC for health-care settings
(1). Policies for defining, collecting, storing, decontaminating, and disposing of infective waste are generally determined by institutions in accordance with state and local regulations. Information

Update: HIV - Continued
regarding waste management regulations in health-care settings may be obtained from state or local health departments or agencies responsible for waste management.

Reported by: Center for Devices and Radiological Health, Food and Drug Administration. Hospital Infections Program, AIDS Program, and Hepatitis Br, Div of Viral Diseases, Center for Infectious Diseases, National Institute for Occupational Safety and Health, CDC.

Editorial Note: Implementation of universal precautions does not eliminate the need for other category- or disease-specific isolation precautions, such as enteric precautions for infectious diarrhea or isolation for pulmonary tuberculosis (*1,2*). In addition to universal precautions, detailed precautions have been developed for the following procedures and/or settings in which prolonged or intensive exposures to blood occur: invasive procedures, dentistry, autopsies or morticians' services, dialysis, and the clinical laboratory. These detailed precautions are found in the August 21, 1987, "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (*1*). In addition, specific precautions have been developed for research laboratories (*28*).

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APPENDIX C
BIOHAZARDS REGISTRATION

Supervisor's Name _____

Location _____

Extension _____

Principal Investigator's Name _____

Location _____

Extension _____

Biohazardous Agent	Specify
Human blood, blood products,	_____
Human body fluids	_____
Human Tissue	_____
Human organs, body parts	_____
Animals, animal carcasses	_____
Virus	_____
Bacterium	_____
Fungi	_____
Rickettsia	_____
Other	_____

Amount ___generated ___used ___handled ___stored per month:

_____

_____

Storage Site _____

Estimated amount for disposal per month _____

Summary of Project _____

_____

_____

_____

_____

Containment Devices Available _____

_____

_____

_____

Investigator's assessment of biohazard

Low Risk _____ Moderate Risk _____ High Risk _____

Personnel involved in this project:

_____

_____

_____

_____

Other pertinent information _____

_____

_____

_____

Form completed by (Signature)_____

Send completed form to: _____

CHAPTER 18

ISOLATION OF ENERGY SOURCES DURING THE SERVICING AND REPAIR OF MACHINES, EQUIPMENT AND PRESSURIZED SYSTEMS

01. POLICY AND DISCUSSION

The purpose of this chapter is to establish requirements and procedures to isolate machines, equipment, and pressurized systems from energy source(s) during servicing or repair by attaching locks or tags to energy isolation device(s). These procedures, which are commonly known as "Lockout/Tagout", are designed to prevent serious injury or death from unexpected start-up, energization, or sudden release of energy while equipment, machines, or pressurized systems are undergoing servicing or repair. Sources of energy can be electrical, steam, hydraulic, pneumatic, gravity, stretched or compressed springs, chemical and others. Some machines may use several types of energy sources.

Statistical studies conducted by the Occupational Safety and Health Administration (OSHA) revealed a high incidence rate of injuries and fatalities among persons who perform servicing and repair on mechanical equipment and pressurized systems. In response to this study OSHA promulgated a new safety standard to prevent these incidents under 29 CFR 1910.147. This chapter incorporates the requirements contained in this OSHA standard.

It is the policy of the Department of Commerce that all machines, equipment, and pressurized systems are to be isolated from their energy sources and locked or tagged out before any servicing or repair work is performed which the unexpected start-up or release of energy could cause injury or death. Lockout, rather than Tagout, is the preferred means of isolating equipment, machines or pressurized systems from their energy source(s), and shall be used whenever possible. Only authorized employees, as described in the definitions in this chapter, and have received required training, are permitted to perform Lockout/Tagout procedures. New machines, equipment and pressurized systems which may need to be locked out shall be equipped with a lockout device when purchased. Whenever existing equipment, machines or pressurized systems undergo major repairs, renovation or modification a lockout device shall be installed. Padlocks and tags shall be used only for locking or tagging out energy isolation devices, and shall be standardized throughout the facility by color, shape and size. Padlocks and tags shall be capable of withstanding the environment they will be exposed to (such as high or low temperatures, chemical vapors, steam etc.) for the maximum time that exposure is expected. Padlocks shall be substantial enough to prevent removal without the use of excessive force, such as with bolt cutters or other metal cutting tools. No two locks in the facility shall be keyed the same, and one key shall be maintained by the Authorized Employee and the other by the supervisor in a readily accessible location. Padlocks and tags shall be removed only by the person(s) who attached them, or by others under emergency situations after receiving authorization from the appropriate supervisor, in accordance with the provisions in section 2.b.(7) of the "Procedures and Requirements of the DOC Lockout/Tagout Program" provided at the end of this chapter. Padlocks shall have a warning affixed to them indicating the lock was attached to prevent serious injury or death and shall not be removed, and also the following information affixed to them: name, department, and phone number of person who attached it. Tagout devices shall have a similar warning printed on them, and also shall provide the name, department, supervisor and phone number of the person who attached it, and the date it was attached. Tagout devices shall be attached to the energy isolation device by a non-reusable, self-locking and non-releasable fastening device which has a minimum pull strength of 50 pounds. A nylon cable tie will meet this requirement.

02. SCOPE

The requirements of this chapter apply to all DOC employees and contractor personnel at all DOC facilities. Lockout/Tagout procedures shall be applied whenever an employee is required to remove a guard or other safety device, or required to place any part of his or her body in a danger zone of any equipment, machinery or pressurized system. Examples of the types of servicing or repair which require Lockout/Tagout procedures to be utilized include replacing drive belts on air handlers, adjusting chain drives, replacing motors, changing the blade on a saw, replacing gaskets on a pressurized system (steam, hydraulic, hot water, pneumatic, etc.), lubricating bearings in the proximity of moving parts, and other such operations.

This chapter does not apply to:

a. Work on electrically powered equipment and machinery which is connected to its energy source by a cord and plug which does not exceed six feet, and which by unplugging will completely eliminate the possibility of unexpected energization or start-up of the equipment or machinery.

b. Exposure to electrical hazards from work on or near electrical conductors or equipment associated with the commercial electrical distribution system, such as building electrical systems, switching stations, underground vaults etc. Lockout/Tagout procedures for electrical work are covered in Subpart S of the OSHA General Industry Standards, 29 CFR 1910.

c. Minor tool changes, routine adjustments, and other minor servicing activities, as long as no guards or other safety devices are removed or bypassed, and there is no exposure to moving parts, electrical conductors, or other such hazards. Such examples are replacing the bit on a drill press, adjusting the tool rest on a grinder, installing a piece to be worked on in a lathe, replacing the cutter on a milling machine and other similar activities.

03. RESPONSIBILITIES

a. Department Heads shall:

1. Submit the names of all employees who service or repair to equipment, machines or pressurized systems which the unexpected start-up, energization, or release of energy could cause injury or death, to the Facilities Office or other appropriate department. Submit the names of all employees whose job requires them to operate or use equipment, machines or pressurized systems on which servicing or repairs is performed under lockout or tagout procedures, or whose job requires him or her to work in an area in which such servicing or repairs are performed. (Such persons are designated as "Authorized Employee" and "Affected Employee"; see definitions for further explanation.)

b. Facilities Office shall:

1. Maintain a roster of Authorized Employees and Affected Employees from names submitted by Department Heads. Maintain an inventory of special padlocks, tags and other devices to isolate energy sources. Issue these devices only to Authorized Employees. Padlocks shall be issued to each

individual, and only one key will be capable of opening each Authorized Employee's lock. The supervisor will be issued a duplicate key to be used only in the event of an emergency. Other devices to isolate energy sources include multi-lockout devices, chains, wedges, key blocks, wedges, and other devices to isolate, secure, or block energy sources.

2. Provide training to Authorized and Affected Employees to ensure they have a thorough understanding of the purpose and function of this program. Each Authorized Employee shall receive training in the recognition of hazardous energy sources present in the workplace, and the methods and means necessary for their effective isolation and control. Such training shall include the proper methods to apply Lockout/Tagout devices, and the use of other means of energy isolation and control, such as using chains or wedges to immobilize large fans, flywheels, pulleys and other such components which are subject to movement. Affected Employees shall be trained in the purpose and use of Lockout/Tagout procedures. Retraining shall be provided for all Authorized and Affected Employees whenever there is a change in their job assignments, a change in machines, equipment, or processes that present a new hazard, or when there is a change in Lockout/Tagout procedures. Additional retraining shall be provided whenever a "Review of Lockout/Tagout Requirements" (copy of this form provided at rear of this chapter) annual evaluation reveals inadequacies in the employee's knowledge or use of Lockout/Tagout procedures.

   Initial training shall be provided at the time of assignment to duties involving work on equipment, machines, or pressurized systems. Refresher training shall be provided every three years for all Authorized and Affected Employees.

   Training records shall include employee's names, the dates the training was provided, and a brief description of the topics covered. Copies of training records shall be maintained by the Facilities Office for five years.

3. Review completed "Review of Lockout/Tagout Requirements" forms (copy provided at end of this chapter) to ensure that all Authorized Employees have a thorough understanding of their responsibilities under this program and are capable of utilizing the Lockout/Tagout procedures properly. If such review identifies any Authorized Employee who does not meet these requirements he/she shall receive additional training. Such persons shall not be permitted to perform Lockout/Tagout procedures until a follow-up review is conducted and they demonstrate adequate competency.

4. Meet with representatives of contractors who will perform work at their facilities which requires the Lockout or Tagout of equipment, machines or pressurized equipment to review their procedures and provide them a copy of the DOC procedures.

5. Ensure that all new equipment, machines and pressurized systems procured or installed are equipped with energy isolating devices which are capable of being locked out.

6. Ensure that whenever major repairs, renovations or modifications of existing equipment, machines or pressurized systems are made, energy isolating device(s) which are capable of being locked out are installed.

7. Develop written procedures for specific types of, or groups of, equipment, machines and pressurized systems within their facilities to control potentially hazardous energy during servicing or repairs. Such procedures shall describe actions necessary to isolate all sources of energy to prevent unexpected start-up, energization or release of energy during servicing or repairs. Provide copies of procedures to supervisors. Maintain copies of procedures for review by outside authorities.

c. Supervisors shall:

1. Ensure that all employees under their supervision who utilize Lockout/ Tagout procedures have received the required training and possess a thorough understanding of the procedures and possess the knowledge and skills required for the proper use of energy controls.

2. Ensure that Lockout/Tagout procedures are utilized only by Authorized Employees, as defined in the definitions section of this chapter.

3. Ensure that Lockout rather than Tagout is always used to isolate energy sources whenever possible.

4. Ensure that Authorized Employees are provided with the proper energy isolation devices, including padlocks, multiple lockout devices, chains, wire ropes, wedges, flanges, tagout tags, and other such devices which are necessary to perform each particular job.

5. Maintain a duplicate key for each padlock assigned to their personnel in a readily accessible location. Such keys will be used only in the event of an emergency, such as when the other key is lost, the Authorized Employee who attached it left it on overnight by mistake, or other such unusual circumstances. The padlock may be removed by others only after the supervisor has evaluated the circumstances and has determined that it is safe to do so in accordance with the provisions provided in section 2.b.(7) of the "Procedures and Requirements of DOC Lockout/Tagout Program" included in this chapter.

6. Conduct an annual review with each of their Authorized Employees and complete the "Review of Lockout/Tagout Requirements" form provided at the end of this chapter. In conducting this review, supervisors are to determine whether the Authorized Employee has a thorough understanding of their responsibilities under this program, and is capable of properly utilizing the Lockout/Tagout procedures. If no operations requiring the utilization of Lockout/tagout procedures are scheduled, have each Authorized Employee simulate the application of the procedures on the type of equipment, machinery or pressurized system they would normally perform the procedures on, and record findings on the review form. Submit copies of the completed review forms to their Facilities Office, or other appropriate administrative office, for review and storage.

d. Employees shall:

1. Not perform any servicing, maintenance, repairs or other work on equipment, machines or pressurized systems where unexpected start-up or energization could cause personal injury or death unless they have been designated an Authorized Employee (as described in the definitions section) and have received the required training.

2. Comply with the Lockout/Tagout procedures and other applicable requirements of this chapter.

PROCEDURES AND REQUIREMENTS OF DOC LOCKOUT/TAGOUT PROGRAM

1. The following procedures are intended to be used to control potentially hazardous energy during the servicing or maintenance of machinery, equipment, steam, and hot water distribution systems, other pressurized systems, and other mechanical devices which have the potential to cause injury or death. Only employees who have been identified by their divisions as authorized employees and have received training are permitted to perform lockout/tagout procedures.

   NOTE: If the machine or equipment is powered only by an electrical cord which is plugged into an outlet, and unplugging the cord will eliminate exposure to the hazards of unexpected energization or start-up, the requirements in these procedures do not have to be followed as long as the plug is disconnected from the outlet and remains in the immediate view of (not to exceed six feet), and control of the person performing the work.

2. All of the following procedures must be followed in the sequence in which they appear:

   a. Preparation for lockout or tagout:

      (1) Conduct a survey to locate and identify all isolating devices to be certain which switch(s), valve(s), or other isolating devices apply to the equipment to be locked or tagged out. Ensure that all energy sources, including electrical, steam, mechanical, hydraulic, chemical, gravity, pneumatic, compressed springs, and others have been identified.

      (2) Notify all affected employees that a lockout or tagout procedure is going to be performed, and why. The authorized employee shall know the type and magnitude of energy that the machine or equipment uses and shall understand the hazards.

   b. Isolating energy-control devices:

      (1) If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).

      (2) Operate the switch, valve, or other energy-isolating device (s) so that the equipment is isolated from its energy source(s). Stored energy (such as in compressed springs; elevated machine members; rotating flywheels; pressurized steam; hot water; pneumatic; hydraulic; capacitors; chemical reaction vessels, etc.) must be dissipated or restrained by methods such as repositioning, blocking, opening valves, disconnecting pipes and misaligning and/or installing flanges; applying double block and bleed procedure; etc. Additional safety measures, such as removal of fuses or circuit breakers and opening of additional disconnecting or relief devices, shall be taken when necessary. Parts of machines or equipment which may move or rotate due to wind currents, positive or negative pressures which may develop inside duct work due to start-up of fans elsewhere in the system, or other reasons must be positively immobilized by using chains, blocks of wood, or other means to prevent movement during servicing. Examples of this are squirrel-cage type fans installed in duct fans on roofs, rams on hydraulic presses, shears, press brakes, steam, hot water, and other pressurized systems.

(3) Attach an individually assigned padlock(s) to the energy-isolating device(s) if it is capable of being locked with a padlock. If the energy-isolating device(s) is not capable of being locked out, a commercially available equipment tagout tag shall be attached to the energy-isolation device(s) at the same location(s) at which the padlock(s) would have been attached. If the tagout tag(s) cannot be attached directly to the energy isolation device(s), it shall be located as closely as is safely possible to the device(s), in a position that will be immediately obvious to anyone attempting to operate the device.

(4) Remove all personnel from the area, and after ensuring that all are clear, operate the push button, or other normal operating controls, to make certain that the equipment will not operate, and is positively isolated from all energy sources. If the equipment will not operate, return the controls to the neutral or off position after the test.

After the preceding steps, if more than one individual is required to lockout or tagout equipment, each shall place his/her own personal padlock or Equipment Tagout Tag on the energy-isolation device(s). If the energy-isolation device cannot accept multiple locks or tagout tags, a multiple lockout or tagout device (hasp) may be used. Primary responsibility for the group of employees whose locks or tagout tags are attached to the multiple lockout/tagout device shall be assigned to an authorized employee who shall monitor the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment. When more than one crew, trade, department, etc. is involved, overall job-associated lockout or tagout control responsibility shall be assigned to an authorized employee who shall be designated to coordinate affected work forces and ensure continuity and protection.

(5) Temporary removal of lockout or tagout devices to test or reposition machine components require the following actions in the sequence in which they appear:

(a) Clear the machine, equipment or system of tools, materials, and other such items.

(b) Clear the surrounding area of nonessential tools, materials, and check the machine, equipment or system being worked on to ensure that all components are operationally intact.

(c) Remove all employees from the area who are not required for testing.

(d) Verify that all affected employees are in a safe location.

(e) Remove the lockout or tagout devices.

(f) Energize and proceed with the testing or positioning.

(g) After the testing or positioning is complete, reapply energy control measures and lockout/tagout devices to continue the servicing or maintenance.

(6) Transfer of lockout/tagout devices during changes of personnel working on machines or equipment shall be done using the following procedures:

(a) The off-going authorized employee shall inform the incoming authorized employee of all locations where lockout and tagout devices are applied.

(b) The off-going authorized employee shall remove their lockout/tagout devices in the presence of the incoming authorized employee, and the incoming authorized employee shall apply his/her lockout or tagout devices at the same location(s) at the same time.

(7) Emergency removal of lockout/tagout devices shall be removed from energy isolating devices by the authorized employee who applied the device. When the employee who applied the lockout or tagout device is not available to remove it, that device may be removed by utilizing the following procedures:

(a) Make a reasonable effort to contact the authorized employee to verify that he/she is not at work.

(b) If the authorized employee who applied the lockout or tagout device is not at work or cannot be located, obtain the duplicate key to the padlock from the supervisor.

(c) Thoroughly check the machine, equipment or system, and the surrounding area to locate the authorized employee prior to removing lockout or tagout device. If the authorized employee cannot be found to remove the lockout or tagout device.

(d) Notify the authorized employee upon his/her return to work that his/her lockout or tagout device was removed before permitting them to return to work on the machine, equipment or system.

3. Restoring machines or equipment to normal operations following lockout or tagout shall be preformed by the authorized employee(s) using the following procedures:

1. The work area shall be checked to ensure that all tools, materials, and other nonessential items have been removed from the machine, equipment, or system being worked on and the surrounding area.

2. Thoroughly check the machine, equipment, or system to ensure that all are components operationally intact.

3. Remove all employees to a safe location.

4. Notify all affected employees that lockout/tagout devices are being removed.

5. Remove lockout/tagout devices and operate the machine, equipment or system, and check to ensure it is operating properly.

REVIEW OF LOCKOUT/TAGOUT REQUIREMENTS

EMPLOYEE REVIEWED	REVIEW DATE	DEPARTMENT	TELEPHONE
CONDUCTED BY		DEPARTMENT	TELEPHONE

LOCKOUT/TAGOUT PROCEDURE REVIEW

DESCRIPTION OF MACHINE OR EQUIPMENT USED IN THIS REVIEW

EQUIPMENT DESCRIPTION	SERIAL NO.	LOCATION

TYPE OF PROCEDURE USED: (If energy isolation device can be padlocked, the Lockout procedure must be used rather than Tagout)

☐ LOCKOUT
☐ TAGOUT

PROCEDURE CHECKLIST	SAT	UNSAT
Conduct survey to locate and identify all isolating devices.		
Notify affected persons that a Lockout or Tagout procedure is to be preformed.		
Shut down machine or equipment by normal stopping means (push the stop button, etc.).		
Place its energy isolation device (switch, valve, etc.) so that it is isolated from its energy source.		
Attach padlock to energy isolation device if it is capable of being locked with a padlock; otherwise attach a special equipment Tagout tag (NDW-NRL 5101/1203).		
Take other actions as necessary to prevent movement of parts, such as placing chains on fan blades, placing block under ram of hydraulic press, removing springs, etc.		
Remove all personnel from the area and then operate controls to ensure that adequate energy isolation has been achieved and the equipment will not operate.		
After maintenance or servicing is complete, and the equipment is ready for normal operations, remove all personnel, tools, etc., from area.		
Reinstall all guards and other safety devices which were removed.		
Remove all Lockout and Tagout devices and operate the equipment.		

LOCKOUT/TAGOUT RESPONSIBILITIES REVIEW	SAT	UNSAT
Maintenance, servicing, or repair on machines or equipment where the unexpected start-up or energization of the equipment could cause personal injury or death shall not be performed unless Lockout/Tagout procedures have been applied.		
Always use Lockout instead of Tagout wherever possible.		
Never remove another person's lock or tag without supervisor's authorization.		
Never borrow or lend locks or keys.		

Based on the above findings, I feel this employee:

☐ Utilized Lockout/Tagout procedures properly and is adequately familiar with his/her responsibilities under the DOC Lockout/Tagout Program.

☐ Needs additonal training in the following areas:

_____

_____

SIGNATURE	NAME (Printed or Typed)	DATE

The U.S. Department of Commerce Occupational Safety and Health Manual clearly states:
Chapter 1. Introduction

02. U.S. DEPARTMENT OF COMMERCE SAFETY AND HEALTH POLICY

It is DOC policy to provide safe and healthful work environments for all employees. These conditions shall be ensured through a comprehensive and effective program fully endorsed by the Secretary of Commerce and implemented throughout the Department. The program shall include the following:

a.) Compliance with applicable standards.

b.) At least annual inspections of all work places by qualified OSH inspectors.

c.) Prompt abatement of identified hazards. To the greatest extent possible, all hazards shall be eliminated or minimized through engineering or administrative controls. Where engineering or administrative controls are not achievable, appropriate personal protective equipment shall be provided at government expense. Where hazard resources are limited, priorities shall be assigned to correct the most serious problems first. Notices shall be posted to warn employees of unabated serious hazards and to provide interim protective measures.

d.) Procedures for all employees to report suspected hazards to their supervisors and/or safety and health officials without fear of reprisal. Allegations of reprisal for such participation shall be filed within existing reporting channels. Nothing, however, shall prohibit the employee from notifying the next higher level safety and health official if appropriate abatement has not occurred.

e.) Appropriate OSH training for safety and health officials, all supervisory personnel and employees. Applicable OSH requirements shall be integrated into training programs and technical publications.

f.) Procedures for the review, in advance of procurement or construction, of facility, system and subsystem design to ensure that OSH hazards are eliminated or controlled throughout the life cycle.

g.) A thorough accident investigation process and a comprehensive OSH management information system which provides all OSH data required by upper management.

CHAPTER 3: OCCUPATIONAL SAFETY AND HEALTH STANDARDS

01. DISCUSSION

a.) Heads of Federal agencies are required to establish procedures for the development of agency OSH standards. Agencies are required to comply with the standards promulgated for the private sector by the Secretary of Labor, pursuant to Section 6 of the Act.

b.) The Department of Commerce has adopted the Occupational Safety and Health Administration (OSHA) standards for use throughout the Department. In addition, DOC has adopted several supplemental standards and other regulatory OSH standards. These are addressed in Section 02 below. More stringent alternate procedures to the OSHA standards may be adopted by operating units following approval procedures addressed in Section 03. of this chapter.

c.) This chapter provides guidance and direction in the development and application of standards within the DOC OSH program.

02. DOC OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Department of Commerce Occupational Safety and Health standards shall consist of the following:

a.) DOC operating procedures (corresponding to chapters in this manual). These procedures will be based on the following:

1.) OSHA standards, including emergency temporary standards issued under the provisions of the OSH Act. Instructions based on these standards may simply refer to a specific OSHA standard (e.g. 29 CFR 1910.95) or may paraphrase, transpose or otherwise adopt the standard without altering the basic criteria unless the alteration applies a more stringent criteria (e.g., lower exposure limits, increased monitoring frequency, etc.). The instruction may also refer to or adopt the latest version of an OSHA reference standard;

2.) Alternate DOC standards, authorized by the Department Safety and Health Program Manager subject to Department of Labor approval;

3.) Supplementary OSH standards covering conditions in unique work places for which no OSHA standards exist;

4.) Other regulatory OSH standards, issued under the statutory authority by Federal agencies such as the Departments of Transportation and Energy, the Nuclear Regulatory Commission (NRC), the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), the Federal Aviation Administration (FAA), and the Coast Guard (CG); or

5.) Special standards, rules, and regulations developed by DOC or operating units to govern on site safety and health to the unique operations, equipment, and systems.
If there is no applicable DOC operating procedure (such as a chapter in this manual or an

operating unit procedure), then check for: b. Published OSHA standards. If there is no published OSHA standard, then 3-2 c. Any nationally recognized source of OSH guidance such as the American Conference of Governmental Industrial Hygienists (ACGIH), the American National Standards Institute (ANSI), the National Fire Protection Association (NFPA), and the National Institute for Occupational Safety andHealth (NIOSH) criteria documents.

A partial listing of current standards that apply to DOC operations below:

- 29 CFR 1910 General Industry Standards,
- 29 CFR 1915 Shipyard Industry,
- 29 CFR 1917 Marine Terminal Operations,
- 29 CFR 1918 Longshoring Industry Standards,
- 29 CFR 1926 Construction Industry Standards,
- EPA Resource Conservation and Recovery Act,
- EPA Comprehensive Environmental Response, Compensation and Liability Act (CERCLA),
- Department of Energy and the Nuclear Regulatory Commission regulations concerning the licensing, use, storage and disposal of radioactive material, and,
- Department of Transportation regulations regarding the marking, and transportation of hazardous materials.

The Department of Commerce has not deemed it necessary to create similar standards and; therefore, is obligated to comply with the above regulations as they are written. When a conflict between Federal, State and/or local standards arises, the most stringent standard will apply.

29 CFR 1910 General Industry Standards:

1910.1200(a)(1)

The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

This section applies to General Industry (part 1910), Shipyards (part 1915), Marine Terminals (part 1917), Longshoring (part 1918), and Construction (part 1926).

.1910.134(a)

(a) *Permissible practice.*

(a)(1) In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering

control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to this section.

(a)(2) Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program which shall include the requirements outlined in paragraph (c) of this section.

1910.1001(d)

Exposure monitoring

1910.1001(d)(2)(i)

Each employer who has a workplace or work operation covered by this standard, except as provided for in paragraphs (d)(2)(ii) and (d)(2)(iii) of this section, shall perform initial monitoring of employees who are, or may reasonably be expected to be exposed to airborne concentrations at or above the TWA permissible exposure limit and/or excursion limit.

1910.1001(d)(7)

Employee notification of monitoring results.

1910.1001(d)(7)(i)

The employer must, within 15 working days after the receipt of the results of any monitoring performed under this sections, notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to affected employees.

1910.1001(d)(7)(ii)

The written notification required by paragraph (d)(7)(i) of this section shall contain the corrective action being taken by the employer to reduce employee exposure to or below the TWA and/or excursion limit, wherever monitoring results indicated that the TWA and/or excursion limit had been exceeded.

1910.1001(e)

Regulated Areas. --

1910.1001(e)(1)

Establishment. The employer shall establish regulated areas wherever airborne concentrations of asbestos and/or PACM are in excess of the TWA and/or excursion limit prescribed in paragraph (c) of this section.

1910.1001(e)(2)

Demarcation. Regulated areas shall be demarcated from the rest of the workplace in any manner that minimizes the number of persons who will be exposed to asbestos.

1910.1001(e)(3)

Access. Access to regulated areas shall be limited to authorized persons or to persons authorized by the Act or regulations issued pursuant thereto.

1910.1001(e)(4)

Provision of respirators. Each person entering a regulated area shall be supplied with and required to use a respirator, selected in accordance with paragraph (g)(2) of this section.

1910.1001(e)(5)

Prohibited activities. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated areas.

1910.1001(f)

Methods of compliance. --

1910.1001(f)(1)

Engineering controls and work practices.

1910.1001(f)(1)(i)

The employer shall institute engineering controls and work practices to reduce and maintain employee exposure to or below the TWA and/or excursion limit prescribed in paragraph (c) of this section, except to the extent that such controls are not feasible.

1910.1001(f)(1)(ii)

Wherever the feasible engineering controls and work practices that can be instituted are not sufficient to reduce employee exposure to or below the TWA and/or excursion limit prescribed in paragraph (c) of this section, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of paragraph (g) of this section.

1910.1001(j)(2)

Duties of employers and building and facility owners.

1910.1001(j)(2)(i)

Building and facility owners shall determine the presence, location, and quantity of ACM and/or PACM at the work site. Employers and building and facility owners shall exercise due diligence in complying with these requirements to inform employers and employees about the presence and location of ACM and PACM.

1910.1001(j)(2)(ii)

Building and facility owners shall maintain records of all information required to be provided pursuant to this section and/or otherwise known to the building owner concerning the presence, location and quantity of ACM and PACM in the building/facility. Such records shall be kept for the duration of ownership and shall be transferred to successive owners.

1910.1001(j)(2)(iii)

Building and facility owners shall inform employers of employees, and employers shall inform employees who will perform housekeeping activities in areas which contain ACM and/or PACM of the presence and location of ACM and/or PACM in such areas which may be contacted during such activities.

1910.1001(j)(3)

Warning signs.

1910.1001(j)(3)(i)

Posting. Warning signs shall be provided and displayed at each regulated area. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area.

1910.1001(j)(3)(ii)

Sign specifications.

1910.1001(j)(3)(ii)(A)

The warning signs required by paragraph (j)(3) of this section shall bear the following information:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE

HAZARD

AUTHORIZED PERSONNEL ONLY

1910.1001(j)(3)(ii)(B)

In addition, where the use of respirators and protective clothing is required in the regulated area under this section, the warning signs shall include the following:

RESPIRATORS AND PROTECTIVE
CLOTHING

ARE REQUIRED IN THIS AREA

1910.1001(j)(3)(iii)

[Reserved]

1910.1001(j)(3)(iv)

The employer shall ensure that employees working in and contiguous to regulated areas comprehend the warning signs required to be posted by paragraph (j)(3)(i) of this section. Means to ensure employee comprehension may include the use of foreign languages, pictographs and graphics.

1910.1001(j)(3)(v)

At the entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which contain ACM and/or PACM, the building owner shall post signs which identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed. The employer shall ensure, to the extent feasible, that employees who come in contact with these signs can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

1910.1001(j)(4)

Warning labels.

1910.1001(j)(4)(i)

Labeling. Warning labels shall be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers. When a building owner or employer identifies previously installed ACM and/or PACM, labels or signs shall be affixed or posted so that employees will be notified of what materials contain ACM and/or PACM. The employer shall attach such labels in areas where they will clearly be noticed by employees who are likely to be exposed, such as at the entrance to mechanical room/areas. Signs required by paragraph (j)(3) of this section may be posted in lieu of labels so long as they contain information required for labelling.

1910.1001(j)(4)(ii)

Label specifications. The labels shall comply with the requirements of 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard, and shall include the following information:

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

1910.1001(j)(5)

Material safety data sheets. Employers who are manufacturers or importers of asbestos or asbestos products shall comply with the requirements regarding development of material safety data sheets as specified in 29 CFR 1910.1200(g) of OSHA's Hazard Communication standard, except as provided by paragraph (j)(6) of this section.

1910.1001(j)(6)

The provisions for labels required by paragraph (j)(4) of this section or for material safety data sheets required by paragraph (j)(5) of this section do not apply where:

1910.1001(j)(6)(i)

Asbestos fibers have been modified by a bonding agent, coating, binder, or other material provided that the manufacturer can demonstrate that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of fibers of asbestos in excess of the TWA permissible exposure level and/or excursion limit will be released or

1910.1001(j)(6)(ii)

Asbestos is present in a product in concentrations less than 1.0%.

1910.1001(j)(7)

Employee information and training.

1910.1001(j)(7)(i)

The employer shall train each employee who is exposed to airborne concentrations of asbestos at or above the PEL and/or excursion limit in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.

1910.1001(j)(7)(ii)

Training shall be provided prior to or at the time of initial assignment and at least annually thereafter.

1910.1001(j)(7)(iii)

The training program shall be conducted in a manner which the employee is able to understand. The employer shall ensure that each employee is informed of the following:

1910.1001(j)(7)(iii)(C)

The quantity, location, manner of use, release, and storage of asbestos, and the specific nature of operations which could result in exposure to asbestos;

1910.1001(j)(7)(iii)(D)

The engineering controls and work practices associated with the employee's job assignment;

1910.1001(j)(7)(iii)(E)

The specific procedures implemented to protect employees from exposure to asbestos, such as appropriate work practices, emergency and clean-up procedures, and personal protective equipment to be used;

1910.1001(j)(7)(iii)(F)

The purpose, proper use, and limitations of respirators and protective clothing, if appropriate;

1910.1001(j)(7)(iii)(G)

The purpose and a description of the medical surveillance program required by paragraph (l) of this section;

1910.1001(j)(7)(iii)(H)

The content of this standard, including appendices.

1910.1001(j)(7)(iii)(J)

The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.

1910.1001(j)(7)(iv)

The employer shall also provide, at no cost to employees who perform housekeeping operations in an area which contains ACM or PACM, an asbestos awareness training course, which shall at a minimum

contain the following elements: health effects of asbestos, locations of ACM and PACM in the building/facility, recognition of ACM and PACM damage and deterioration, requirements in this standard relating to housekeeping, and proper response to fiber release episodes, to all employees who perform housekeeping work in areas where ACM and/or PACM is present. Each such employee shall be so trained at least once a year.

1910.1001(j)(7)(v)

Access to information and training materials.

1910.1001(j)(7)(v)(A)

The employer shall make a copy of this standard and its appendices readily available without cost to all affected employees.

29 CFR 1926 Construction Industry Standards:

"Purpose." This section contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. These releases may result in toxic, fire or explosion hazards.

1926.20(f)

Compliance duties owed to each employee.

1926.20(f)(1)

Personal protective equipment. Standards in this part requiring the employer to provide personal protective equipment (PPE), including respirators and other types of PPE, because of hazards to employees impose a separate compliance duty with respect to each employee covered by the requirement. The employer must provide PPE to each employee required to use the PPE, and each failure to provide PPE to an employee may be considered a separate violation.

1926.20(f)(2)

Training. Standards in this part requiring training on hazards and related matters, such as standards requiring that employees receive training or that the employer train employees, provide training to employees, or institute or implement a training program, impose a separate compliance duty with respect to each employee covered by the requirement. The employer must train each affected employee in the manner required by the standard, and each failure to train an employee may be considered a separate violation.

1926.28(a)

The employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions or where this part indicates the need for using such equipment to reduce the hazards to the employees.

EPA Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, $1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. CERCLA:

- established prohibitions and requirements concerning closed and abandoned hazardous waste sites;
- provided for liability of persons responsible for releases of hazardous waste at these sites; and
- established a trust fund to provide for cleanup when no responsible party could be identified.

The law authorizes two kinds of response actions:

- Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response.
- Long-term remedial response actions, that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on EPA's National Priorities List (NPL).

CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL.

CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986.

The Comprehensive Environmental Response, Compensation, and
Liability Act (CERCLA) requires notification to the National Response Center immediately following the release of a hazardous substance in an amount that exceeds its reportable quantity. 42 U.S.C. 5 9603. Asbestos is a CERCLA hazardous substance. 42 U.S.C. 5 9601(14): 40 C.F.R. 5 302.4.

We recommend that CERCLA Section 103(a) violations be alleged when prima facie evidence exists.'

11. ELEMENTS FOR A SECTION 103(a) CLAIM Pursuant to Section 103(a) of CERCLA, a person in charge of a facility is required to notify the National Response Center as soon as he or she has knowledge of a release of a hazardous substance from such facility in an amount equal to or greater than the reportable quantity for that substance. The failure to report the release subjects the non-reporting party to judicial or administrative proceedings and penalties of up to $25,000 per day of the violation. 42 U.S.C. 0 9609(a),(b) and (c). Penalties of up to 575,000 per day may be imposed in the case of a second violation.

DEPARTMENT OF COMMERCE
HERBERT C. HOOVER BUILDING
ASBESTOS MITIGATION RESPONSE

DRAFT

OBJECTIVE:

To provide a safe and healthy work environment for our tenant by minimizing the risk of exposure to airborne asbestos fibers.

TRIGGER EVENT:

On April 24, 2007 the Department of Commerce (DOC) provided the General Services Administration (GSA) Triangle Service Center (WPZ) with air sampling results from the 8th floor attic that reportedly exceeded the Occupational Safety and Health Administration's permissible exposure limit for airborne asbestos fibers. This information was forwarded to the GSA, NCR, Safety, Environment and Fire Protection Branch (WPYG). WPYG met with DOC on April 27, 2007 to discuss the test results from the 8th floor. On May 2, 2007, WPYG conducted a survey to assess the conditions on the 8th floor and commenced air sampling on May 3, 2007. WPYG will continue to execute air sampling throughout the building to assess the potential for cross contamination. Cross contamination to other parts of the building is a concern; however, our test data has not led us to this conclusion and we conclude the contamination is confined to the 8th floor. The 8th floor is not occupied space; however, it houses air handling units, steam valves, elevator machine rooms, and other vital mechanical systems. Access to the 8th floor has been restricted to authorized personnel wearing personal protection equipment (PPE) for asbestos exposure.

AIR SAMPLING METHODOLOGY:

The National Institute for Occupational Safety and Health (NIOSH) Method 7400, Phase Contrast Microscopy (PCM) was used by DOC to determine the exposure level of airborne fibers on the 8th floor. PCM does not positively identify asbestos fibers; other fibers may be included in the count. Positive identification of asbestos fibers from samples analyzed using PCM is obtained using the Transmission Electron Microscopy (TEM), NIOSH Method 7402.

- The Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limit (PEL) for airborne asbestos is 0.1 fibers per cubic centimeter (f/cc) as an 8 hour time-weighted average (TWA).

- The OSHA Excursion Level (EL) for exposure to airborne asbestos is 1.0 f/cc as a 30-minute TWA.

AIR SAMPLING TEST RESULTS

- **Sampling Commissioned by DOC:**
  DOC commissioned Peak Safety Systems Incorporated to perform air sampling on the 7th and 8th floors.

  - **Peak Tests:**

    - On February 23, 2007, 2 air samples were taken in the 8th floor attic using PCM NIOSH Method 7400 to determine the concentration of air borne fibers. The concentration of airborne fibers in both samples exceeded the OSHA PEL. TEM analysis was not performed to determine if the samples contained asbestos fibers.

    - On April 17, 2007, 7 air samples were taken in the 8th floor attic using PCM and PCM Excursion analysis to determine the concentration of airborne fibers. The concentration of airborne fibers in all 7 samples exceeded the OSHA PEL. TEM analysis was not performed to determine if the samples contained asbestos fibers.

    - On April 25, 2007, 8 PCM and 3 TEM air samples were taken in the 8th floor attic to determine the concentration of airborne asbestos fibers. The concentration of airborne fibers in the 8 PCM samples exceeded the OSHA PEL. The 3 samples analyzed using the TEM NIOSH Method 7402 contained a percentage of chrysotile asbestos.

    - On May 2, 2007 5 air samples were taken, location not specified, using TEM analysis to detect the presence of airborne asbestos fibers. The concentration of airborne fibers in all 5 samples were less than 0.009 f/cc, no asbestos was detected.

    - On May 7, 2007, 6 air samples were taken at the penetration between the 7th and 8th floors using TEM analysis to check for the presence of asbestos fibers. The concentration of airborne fibers was less than 0.003 f/cc for all 6 samples, no asbestos was detected.

    - On May 7, 2007, Bulk sampling were taken from the two air-handling units on the 8th floor, no asbestos was detected.

- **Sampling Commissioned by GSA:**
  WPYG commissioned Global Consultants to perform air sampling on the 8th floor and Tidewater Incorporated to perform air sampling on the 1st through 7th floors and basement levels.

- **Global Tests**: TEM analysis for an 8 hour exposure interval was used to determine the concentration of airborne fibers and to identify the presence of asbestos in the samples. The OSHA PEL for airborne fibers is 0.1 f/cc for an 8 hour time weighted average.

  - On May 03, 2007, 14 air samples were collected on the 8th floor attic. The air samples were analyzed by TEM using the NIOSH Method 7402. The results of the 14 air samples ranged from less than 0.002 to 0.010 f/cc of air. The U.S. EPA recommended fiber level for office environments is less than 0.01 f/cc. Amosite and chrysotile asbestos fibers were detected in 4 of the samples.

  - On May 04, 2007, 8 air samples were taken at the exhaust fans in Courtyards 1 and 6 and at the air intake to the White House Visitor Center and analyzed using TEM analysis. The TEM readings on all 8 samples were less than 0.01 f/cc. No asbestos fibers were detected on any of the 8 samples.

- **Tidewater Tests**: PCM analysis for an 8 hour exposure interval is being used to determine the concentration of airborne fibers throughout the occupied spaces.

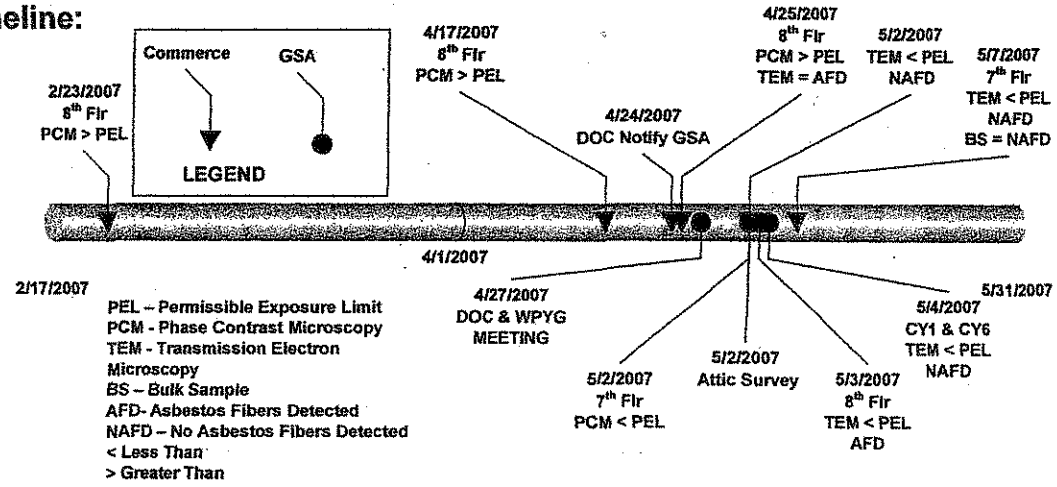
  - From May 2 through May 9, 2007 a total of sixty-five (65) air samples were collected from the 3rd through the 7th floors, and analyzed using the NIOSH Method 7400. The results of all 65 samples were less than 0.01 fibers per cubic centimeter of air (<0.01 f/cc), which is well below the EPA recommended fiber level for office environments. TEM analysis was not required per GSA Fiber-In-Air Protocol.

  - Air sampling of the 1st and 2nd floors and the basement levels are in progress.

➢ **Fiber-In-Air Analysis:**

The results of all 22 samples analyzed by TEM indicated airborne fiber levels less than 0.01 f/cc of air which is below the EPA recommended fiber level for office environments. However, photographic documentation showing damaged ACM's and the presence of amosite and chrysotile asbestos fibers on a number of samples indicates that damaged ACM's are contributing to the concentration of airborne fibers in the breathing zone of personnel who may access the space. Since both spray-on fireproofing and pipe insulation appear to be damaged, it is not possible to determine which type of ACM is contributing to the airborne fiber levels in the attic area. Also note that certain operation and maintenance activities in the attic area could potentially result in elevated fiber concentration.

➢ Timeline:

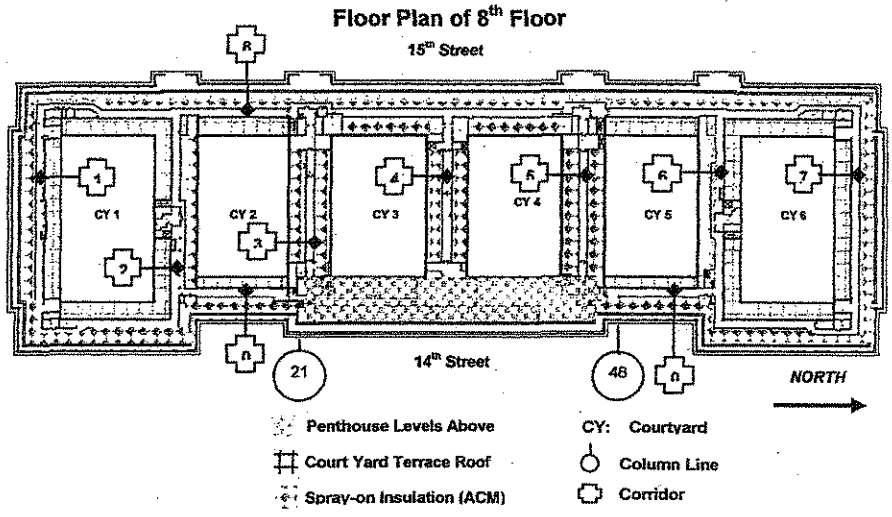


HAZARD ASSESSMENT:

GSA NCR commissioned Global Consultants (Industrial Hygienist Firm) to perform a hazard assessment of the 8th floor to identify damaged asbestos containing material in the corridors, attic eaves areas, routine maintenance areas, and the Penthouse levels. Global identified damaged spray-on fireproofing and pipe insulation in the attic eaves areas, and damaged pipe insulation in the corridor and penthouse levels. Penetrations were observed in the walls separating the attic eaves areas from the access corridors. These penetrations are conduits for the migration of asbestos fibers throughout the 8th floor and the penthouse levels. Sealing these openings with air tight impermeable barriers will prevent the migration of asbestos fibers. The types of penetrations in the corridor walls include door shaped openings, valve access openings, irregular shaped openings, and ventilation openings. Other types of asbestos containing materials identified include mudded pipe fittings, and cloth vibration dampers.

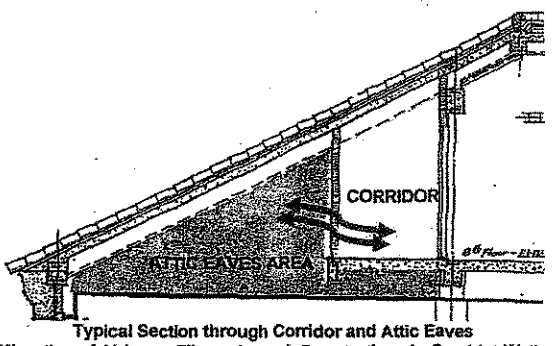

Opening in Corridor Walls

The Hazard Assessment concludes that the asbestos contamination encompasses the entire 8th floor and the adjoining Penthouse. The footprint of the 8th floor is identical to that of the lower floors. The Penthouse traverses the east corridor between column lines 21 and 48 and has two levels, the 8-1/2 and 9th floors.



- **Access Corridor:** The 8th floor consists of 9 corridors identified as 0 through 8 which provide access to routine maintenance areas: including elevator machine rooms (11), electrical closets, steam line shutoff valves, and an air handling unit at the intersection of corridors 8 and 4. The asbestos containing material in the corridors include damaged pipe insulation and asbestos residue from cross contamination.

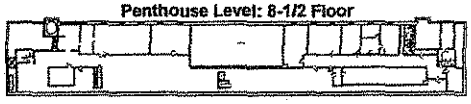
- **Attic Eaves Space**: The attic eaves areas encompass the perimeter corridors (0, 1, 8, and 7) forming a continuous loop that terminates at the Penthouse. Corridors 3, 4, and 5 have attic eaves on both sides. Corridors 2 and 6 have attic eaves on only one side. The asbestos containing materials in the attic eaves include spray-on fire proofing, damaged pipe insulation, and construction debris. The attic eaves areas serve as a chase for the steam distribution lines. Risers for the steam lines are space at 15 foot intervals with shutoff valves that are accessed through penetration in the corridor walls.



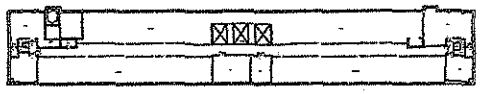
Typical Section through Corridor and Attic Eaves
Migration of Airborne Fibers through Penetrations in Corridor Walls

- **Penthouse Levels (8-1/2 & 9th Floors):** The Penthouse is located directly above the 8th floor East Corridor between column lines 21 and 48. The Penthouse contains an air handling unit telephone main frame, elevator machine rooms, and equipment rooms for Verizon Wireless, Nextel Communications, and Cingular Wireless on the 9th floor. It is also provides access to the cooling towers. The asbestos containing materials include damaged pipe insulation, demolition debris, and abandoned ductwork.

Penthouse Level: 8-1/2 Floor



Penthouse Level: 9th Floor



- **GSA, NCR, Asbestos Management Policy:**

GSA minimizes asbestos exposures for all building occupants through managing asbestos in place, where it is in good condition, and promptly abating the excess risk from asbestos that is damaged or subject to disturbance by routine operations or planned renovation. Undisturbed asbestos generally does not pose a health risk; exposure occurs when asbestos is disturbed, causing fibers to be released into the air and then inhaled. Asbestos management, inspection, and guidance documents include the EPA Green Book, EPA AHERA and ASHARA regulations, and the OSHA General Industry and Construction Standards. The federal Asbestos Hazard Emergency Response Act (AHERA) response actions include establishing an operations and maintenance plan, encapsulation, enclosure, repair, or removal.


Damaged Pipe Insulation

GSA, NCR, SAFETY, ENVIRONMENT AND FIRE PROTECTION BRANCH RECOMMENDATIONS:

Contain the spray-on fireproofing within the 8th floor eaves. Repair or replace damaged pipe insulation in the corridor and penthouse areas. Clean corridor surfaces, occupied spaces, and routine maintenance areas.

- **Response Action in Attic Eaves Areas**: Enclosure
  - Install air tight metal barriers at wall penetrations
  - Provide access to steam shutoff valves form corridors
  - Install decontamination facility at entry points
  - Install window louvers for ventilation

- **Response Action for Access Corridors (8th Floor):** Repair /Removal
  - Isolate corridors into manageable containment zones for the execution of response actions.
  - Repair damaged pipe insulation
  - Remove contaminated debris
  - Decontaminate area for occupation by HEPA Vacuuming and wet wiping all surface areas
  - Test of air handling unit (AHU) insulation.
  - Replace air filters in AHUs.
  - Perform air clearance sampling, including TEM analysis.

- **Response Action for Penthouse Levels:** Repair /Removal
  - Repair damaged pipe insulation
  - Remove contaminated debris
  - Remove abandoned duct work and AHU
  - Decontaminate area for occupation by HEPA Vacuuming and wet wiping all surface areas
  - Install air tight barriers in floor openings
  - Repair damaged ceiling
  - Test of air handling unit (AHU) insulation.
  - Replace air filters in AHUs.
  - Perform air clearance sampling, including TEM analysis.

COST ESTIMATE:

INDUSTRIAL HYGIENE SERVICES INDEPENDENT GOVERNMENT ESTIMATE WORKSHEET

ITEM NO.	ITEM DESCRIPTION	WORK UNIT	ESTIMATED QUANTITY	GSA UNIT PRICE	Recurring Cost	Non-Recurring Cost	ESTIMATED PROJECT COST
1	Door-Shaped Openings	SF	1375	10.20		14,025	14,025
2	Valve Access Openings	SF	156	10.20		1,591	1,591
3	Irregular Shaped Openings	SF	480	10.20		4,896	4,896
4	Damaged Pipe TSI	LF	130	190.00	24,700		24,700
5	Surface Decontamination	SF	275,000	0.38	52,250	52,250	104,500
6	Containment Area (6 Phases)	ea.	6	14,212.00	42,636	42,636	85,272
7	Air Filtration Units Installed	ea.	6	855.00		5,130	5,130
8	Testing	ea.	120	500.00	30,000	30,000	60,000
9	Decontamination Facility					3,500	
	Subtotal				149,586	154,028	303,614
	General Conditions and Labor Burdun 32%				47,868	49,289	97,157
	TOTAL ESTIMATED COST				$ 197,454	$ 203,317	$ 400,771

Total Commerce Cost	**$197,454**
Total GSA Cost	**$203,317**
TOTAL	**$400,771**

********** NOTICE **********

Restricted access to the 8th floor should continue until further notice.

All abatement work will be done during non-business hours with AHU shut down.

Herbert C. Hoover Building
Position Paper
Cost Sharing Proposal for Asbestos Abatement Project

Per the May 31, 2007, meeting between representatives of the Department of Commerce (Commerce) and the General Services Administration (GSA), Commerce agreed with the actions GSA proposed in the Asbestos Mitigation Response Actions and with the overall cost estimate. However, Commerce took the position that it will only provide funds to repair pipe insulation as part of the abatement project unless there is specific language contained in the Delegation of Authority that specifically obligates Commerce to abate the asbestos. This paper explains the responsibilities and obligations of Commerce under the delegation of authority for the operation and maintenance of the Herbert C. Hoover Building in Washington, DC.

I. Facts

Beginning in the late 1980s, GSA and Commerce entered into a series of delegations regarding the Herbert C. Hoover Building. The current Delegation originally covered the period from October 1, 1993 through September 30, 1997, and was amended in October 1997 to indefinitely extend the term until terminated by either Agency.

On April 24, 2007, Commerce provided GSA, Triangle Service Center, with air sampling results from the 8th floor attic that reportedly exceeded the Occupational Safety and Health Administration's permissible level of 0.01 fibers per cubic centimeter of air for airborne fibers. This information was forwarded to GSA, NCR, Safety, Environment and Fire Protection Branch (WPYG). WPYG met with Commerce on April 27, 2007 to discuss the Commerce test results from the 8th floor. On May 2, 2007, WPYG conducted a survey to assess the conditions on the 8th floor and commenced air sampling on May 3, 2007.

From May 2, 2007 through May 4, 2007, GSA performed Transmission Electronic Microscopy (TEM) on fourteen samples from the 8th floor and eight samples from Courtyards 1 and 6. While asbestos fibers were found in four samples from the 8th floor, all results for airborne fibers were below the Permissible Exposure Level (PEL). In addition, over 100 air samples from the basement through the 7th floor were tested during the first two weeks in May using Phase Contrast Microscopy (PCM). Again, all sample results were below the PEL for airborne fibers.

Although all air samples were below the PEL, photographic documentation shows damaged asbestos containing materials (ACMs). The sprayed on asbestos and the pipe insulation appear to be damaged, and both contain the types of mineral asbestos found in the four samples from the 8th floor.

II. Discussion

A. The Delegation Requires Commerce to Abide by all Environmental Laws and Regulations, Including the Federal Management Regulations

A review of the delegations shows that the basic language has remained relatively constant over the past twenty years. The need to significantly alter the delegations to account for new laws, regulations, or Executive Orders is muted by the plain language of the Delegation. For instance, the Delegation provides:

> Authorities vested in the Administrator by Reorganization Plan No. 18 of 1950, the Federal Property and Administrative Services Act of 1949, as amended, the Public Buildings Act of 1959, as amended, the Public Buildings Amendments of 1972, the Public Buildings Cooperative Use Act of 1976, and the Public Buildings Amendments of 1988, to perform functions with respect to the operation, maintenance, repair, preservation, alteration, and protection of the building(s) identified in appendix I, are hereby delegated without limitation, except as specified herein or required by law, Executive order, or regulation promulgated pursuant to law. Unless modified, waived or superseded by provisions contained in this delegation, all provisions contained in Public Laws and in the Federal Property Management Regulations (FPMR's), Subchapter D, as amended, applying to the General Services Administration (GSA) pertaining to the operation, maintenance, repairs, alterations, protection, and administration of buildings and grounds under the authority and control of GSA apply to the Agency.

August 11, 1994 Delegation at Section 2. This passage demonstrates that the Delegation does not, and cannot, serve as a stand-alone document. Rather, the Delegation must be reviewed and interpreted in conjunction with various laws and regulations, including the Federal Management Regulations ("FMRs").

The Delegation itself provides that, "[Commerce] is responsible for complying with safety and environmental laws and regulations while operating and maintaining building equipment." Delegation at Section 5.B(5). In addition, as stated in the FMR under the section entitled, "Safety and Environmental Management:"

> The real property policies contained in this part apply to Federal agencies, including GSA's Public Building Service (PBS), operating under, or subject to, the authorities of the Administrator of General Services. The responsibilities for safety and environmental management under this part are intended to apply to GSA or those Federal agencies operating in GSA space pursuant to a GSA delegation of authority.

41 C.F.R. § 102-80.5. Thus, because the building at issue is delegated, the FMR's provisions regarding responsibilities for safety and environmental management apply to Commerce.

Moreover, the plain language of the Delegation itself makes perfectly clear that the FMR applies to Commerce.

The FMR lists Federal agencies' responsibilities concerning the assessment and management of asbestos, in part, as follows:

> (a) Inspect and assess buildings for the presence and condition of asbestos-containing materials. Space to be leased must be free of all asbestos containing materials, except undamaged asbestos flooring in the space or undamaged boiler or pipe insulation outside the space, in which case an asbestos management program conforming to U.S. Environmental Protection Agency (EPA) guidance must be implemented.
> (b) Manage in-place asbestos that is in good condition and not likely to be disturbed.
> (c) Abate damaged asbestos and asbestos likely to be disturbed. Federal agencies must perform a pre-alteration asbestos assessment for activities that may disturb asbestos.

41 C.F.R. § 102-80.15. These responsibilities are not modified, waived or superseded by provisions contained in the Delegation. Consequently, Commerce remains responsible for assessing and managing asbestos in accordance with the FMR.

B. Commerce Pays for all Recurring Repairs and Alterations

The 1994 Delegation provides a cost-sharing mechanism that is divided between recurring and non-recurring costs. The Delegation obligates Commerce to pay for all recurring repairs and tenant alterations, regardless of cost. *See* Section 5.D.2. A repair and alteration consists of all repair or alteration projects costing $10,000 or more, including material, labor, design, and supervision cost. *See* Section 5.D.1. The Delegation does not provide a definition of a recurring repair, but does provide a list of examples, including:

> [c]orrective actions that must be undertaken to repair defective mechanical, plumbing, electrical, firesafety, and elevator/escalator system components and major pieces of equipment.

Delegation at Appendix IV, Figure A. This example shows that recurring costs include corrective actions that must be undertaken to: (1) repair defective mechanical system components; (2) repair defective plumbing system components; and (3) repair defective fire safety system components. As indicated above, the ACMs at issue involve pipe insulation and spray-on fireproofing. Commerce has already agreed with GSA's reasoning that the damaged pipe insulation is a recurring repair, and, therefore, there is no dispute regarding that issue. GSA relies on similar reasoning as to why Commerce should provide funding for other portions of the abatement project.

The asbestos in the Commerce Building is owned by GSA. Regulation requires that building owners determine the presence, location and quantity of ACM/PACM. This information is to be passed along to the occupants or manager of the building so that they can not only know the location of the ACM, but they can label the material as required by law and notify their employees.

There are a few key facts that are important to remember.

1. It really doesn't matter what year the asbestos was installed into the attic. Whether it was around the time that the building was built or if it was installed in 1962, it is still the responsibility of the owner of the building and it doesn't make it any less dangerous.

2. The material is in **very poor** condition. This is what presents a danger
3. The spray -on in the attic does not fall under the O&M plan. The plan is for small scale short duration projects. The amount of spray on in the attic that has delaminated from its substrate is large. All of this is a hazard and must be removed. For safety's sake, it can't wait until renovation.
    a. The amount of air erosion that passes over the material is great to say the least.
    b. The vibration that occurs every 15 to 20 seconds is both audible and visible.
    c. The outside contractors that have come onsite without the knowledge or scheduling of commerce and that have made penetrations into the 7th floor are numerous.
4. What is the date of this plan? There are some deficiencies in the O&M report.

    a. None of the report states the condition of the material. The designated person who will be doing the inspection needs to know this information. Friable and Non Friable is not a state of condition.

    b. It has been stated that air sampling was conducted or not conducted for a period of time. Historical air sampling in the attic actually does us no good. The spray-on in the attic has been in poor condition for a long period of time. (More than 10 years) Contractors that go into the attic have disturbed the material and there are many breaches in the building.

Find out Who is this person. Tom Lee? find h...

****Remember asbestos goes where the air goes. Just because there may be negative pressure in some parts of the attic does not mean that large amounts of fibers don't escape.**** There is no safe level of asbestos exposure.

GSA

GSA National Capital Region

JUL 2 2007

Mr. Fred Fanning
Director, Office of Administrative Services
U.S. Department of Commerce
1401 Constitution Avenue, NW
Washington, DC 20230

Dear Mr. Fanning: Fred –

On May 31, 2007, my staff met with members of your office to review the proposed Asbestos Mitigation Response Actions for abating asbestos containing material (ACM) located on the 8th floor and Penthouse levels of the Herbert C. Hoover Building. At that meeting, the Department of Commerce (Commerce) representatives were in agreement with the General Services Administration's (GSA's) plan for abating the ACMs and the overall cost estimate. However, Commerce took the position that it will only provide funds for the repair of the pipe insulation. In addition, Commerce asked that GSA provide specific language contained in the Delegation of Authority that requires Commerce to abate asbestos.

I'd like to note that the Delegation of Authority does not stand alone, but rather must be interpreted along with the Federal Management Regulations (FMR), Federal laws, and environmental regulations. Commerce is required to abide by all laws and regulations cited in the delegation.

GSA's position is explained in the enclosed document, titled "Cost Sharing Proposal for Asbestos Abatement at the Herbert C. Hoover Building."

GSA's cost sharing proposal is reasonable and consistent with the Delegation of Authority. I am, therefore, requesting that Commerce remit payment to GSA via a reimbursable work authorization in the amount of $230,000. This amount, including GSA fees, is based on preliminary estimates and is subject to change based on actual contract cost.

U.S. General Services Administration
301 7th Street, SW
Washington, DC 20407-0001
www.gsa.gov

We look forward to a prompt resolution of this funding issue, as our GSA team is ready to proceed with the procurement of the abatement contract. If you deem necessary, I would be pleased to meet with you and representatives from your staff regarding this matter. In the interim, if you have any questions or need additional information, please do not hesitate to contact me or my Deputy, Steven Williford, at (202) 708-5891.

Sincerely,

Bart Bush
Assistant Regional Administrator
Public Buildings Service

Enclosure

Regulations (Standards - 29 CFR) - Table of Contents

- **Part Number:** 1960
- **Part Title:** Basic Program Elements for Federal Employees OSHA
- **Subpart:** B
- **Subpart Title:** Administration
- **Standard Number:** 1960.6
- **Title:** Designation of agency safety and health officials.

1960.6(a)

The head of each agency shall designate an official with sufficient authority and responsibility to represent effectively the interest and support of the agency head in the management and administration of the agency occupational safety and health program. This Designated Agency Safety and Health Official should be of the rank of Assistant Secretary, or of equivalent rank, or equivalent degree of responsibility, and shall have sufficient headquarters staff with the necessary training and experience. The headquarters staff should report directly to, or have appropriate access to, the Designated Agency Safety and Health Official, in order to carry out the responsibilities under this part.

1960.6(b)

The Designated Agency Safety and Health Official shall assist the agency head in establishing:

1960.6(b)(1)

An agency occupational safety and health policy and program to carry out the provisions of section 19 of the Act, Executive Order 12196, and this part;

1960.6(b)(2)

An organization, including provision for the designation of safety and health officials at appropriate levels, with adequate budgets and staffs to implement the occupational safety and health program at all operational levels;

..1960.6(b)(3)

1960.6(b)(3)

A set of procedures that ensures effective implementation of the agency policy and program as required by section 19 of the Act, Executive Order 12196, and the program elements of this part, considering the mission, size, and organization of the agency;

1960.6(b)(4)

Goals and objectives for reducing and eliminating occupational accidents, injuries, and illnesses;

1960.6(b)(5)

Plans and procedures for evaluating the agency's occupational safety and health program effectiveness at all operational levels; and

1960.6(b)(6)

Priorities with respect to the factors which cause occupational accidents, injuries, and illnesses in the agency's workplaces so that appropriate corrective actions can be taken.

1960.6(c)

The agency head shall assure that safety and health officials are designated at each appropriate level with sufficient authority and responsibility to plan for and assure funds for necessary safety and health staff, equipment, materials, and training required to ensure implementation of an effective occupational safety and health program.

Next Standard (1960.7)

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