

Attachment 3

GUIDELINES: ASBESTOS HANDLING FOR THE CHLOR-ALKALI INDUSTRY

Edition 3

DRAFT #2

August 19, 1994

CHLORINE INSTITUTE PAMPHLET 137

The Chlorine Institute, Inc., 2001 L Street, NW, Washington, DC 20036

**PLAINTIFF'S
EXHIBIT
AL-1721**

C35703 1188

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1. INTRODUCTION

1.1 SCOPE

This pamphlet has been developed by the Chlorine Institute to assist member companies in the continued safe handling and disposal of asbestos.

The safety and health of workers and of the general public in dealing with possible airborne emissions and their protection from hazards associated with asbestos are of paramount concern.

The pamphlet addresses safe asbestos handling procedures for the chlor-alkali industry. Cited examples may not be universally accepted and do not represent the only safe method of handling asbestos.

The pamphlet references U.S. Federal regulations that are in effect at the publication date. Additional Federal, State and local, as well as foreign regulations may impose different or additional obligations. All users are urged to keep abreast of all governmental regulations concerning asbestos.

For purposes of this publication, the General Industry Asbestos Standard, not the Construction Industry Asbestos Standard is assumed to apply to U.S. chlor-alkali cell renewal operations. Member companies are encouraged to become familiar with the Construction Industry Standard as it may apply in certain situations

1.2 DEFINITIONS AND ABBREVIATIONS

Action level - a concentration of asbestos of 0.1 fibers per cubic centimeter of air measured as an eight-hour TWA that triggers certain requirements of the Asbestos Standard.

Approved Respirator - a respirator approved by the National Institute of Occupational Safety and Health and the Mine Safety and Health Administration for asbestos use.

Asbestos - OSHA defines asbestos to include chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos and any of these minerals that have been chemically treated and/or altered.

Asbestos Standard - For the purposes of this pamphlet, the Asbestos Standard means the OSHA Asbestos Standard for general industry, 29 CFR 1910.1001.

CFR - U.S. Code of Federal Regulations

DOT - U.S. Department of Transportation

EPA - U.S. Environmental Protection Agency

HEPA - High Efficiency Particle Air filter (99.97% efficient for 0.3 micron particles)

- 1 Institute - The Chlorine Institute, Inc.
- 2
- 3 MSDSs - Material Safety Data Sheets
- 4
- 5 NESHAP - National Emission Standards for Hazardous Air Pollutants
- 6
- 7 OSHA - U.S. Occupational Safety and Health Administration of the Department of Labor
- 8
- 9 PEL - (Permissible Exposure Limit) a concentration of asbestos of 0.2 fibers per cubic
- 10 centimeter of air measured as an eight-hour TWA that triggers certain requirements of
- 11 the Asbestos Standard
- 12
- 13 Regulated areas - Areas where airborne asbestos levels exceed or are likely to exceed
- 14 the PEL
- 15
- 16 TWA - Time Weighted Average

1.3 DISCLAIMER

The information in this pamphlet is drawn from sources believed to be reliable. The Institute and its members, jointly and severally, make no guarantee, and assume no liability, in connection with any of this information. Moreover, it should not be assumed that every acceptable procedure is included, or that special circumstances may not warrant modified or additional procedures. The user should be aware that changing technology or regulations may require changes in the recommendations contained herein. Appropriate steps should be taken to ensure that the information is current when used. These recommendations should not be confused with federal, state, provincial, municipal, or insurance requirements, or with national safety codes.

1.4 APPROVAL

The Institute's Environment and Health Committee approved the third edition of this pamphlet on _____. This third edition reflects current U.S. regulations and general industry practices and, as such, replaces the second edition.

1.5 REVISIONS

Suggestions for revisions should be submitted to the Secretary of the Institute.

1.6 REPRODUCTION

The contents of this pamphlet are not to be copied for publication, in whole or in part, without the prior written approval of the Institute.

1.7 SUMMARY OF MAJOR REQUIREMENTS (OSHA 29 CFR PART 1910.1001)

If the asbestos concentration is at or above, or may reasonably be expected to be at or above, the "Action Level", the employer must:

- * Provide employee training about asbestos.
- * Provide a medical surveillance program.

If asbestos concentration is at or above, or may reasonably be expected to be at or above, the "Permissible Exposure Limit", the employer must:

- * Establish regulated areas with demarcation signs, limited access and respiratory protection. Certain activities are prohibited in regulated areas.
- * Institute certain engineering controls and work practices to prevent employee exposure.
- * Develop a written compliance program to identify how exposure levels will be reduced.
- * Provide proper respiratory protection, protective clothing and equipment as well as appropriate handling, storage, cleaning, replacement and

disposal practices for the clothing and equipment.

- * Provide appropriate hygiene facilities (change rooms, lockers, showers, etc.)

2. ASBESTOS USE IN CHLORINE MANUFACTURING

Most of the world's chlorine is produced by the electrolysis of brine in diaphragm, mercury and membrane cells. Asbestos is used in diaphragm cells.

In diaphragm cells, chlorine produced in the anolyte compartment must be kept separate from the alkali metal hydroxide and hydrogen formed in the catholyte compartment. This separation is accomplished by an asbestos diaphragm.

Saturated brine is fed into the anolyte compartment where the chloride ion is electrolyzed to chlorine. The depleted brine and the cation pass through the diaphragm to the cathode compartment where the alkali metal hydroxide and hydrogen are produced.

The diaphragm material is the key to the successful operation of a diaphragm cell. Essential characteristics include sufficient mechanical strength, high chemical resistance to both acids and bases, low electrical resistance, uniform and consistent deposits on the cathode, appropriate physical structure to permit flow of depleted brine with minimum

1 back-migration of hydroxyl ion, and an acceptable service life.

2
3 Asbestos is very well suited as a diaphragm material because it exhibits a highly
4 favorable combination of these characteristics. Chrysotile asbestos, or white asbestos,
5 is the predominant form of asbestos used for diaphragms. Although many other
6 materials have been tested as alternatives to asbestos, few have been commercially
7 successful to date.

8
9 Asbestos' unique behavioral characteristics in the chlor-alkali cell environment have been
10 studied. The deposited fibers on the cathode act differently than just a filter media. A
11 gel layer forms in the mat (under proper depositing and operating conditions) and plays
12 a significant role in the performance of the diaphragm, especially in minimizing the
13 back-migration of the hydroxyl ion.

14
15 North American consumption of asbestos for diaphragm cells in the chlor-alkali industry
16 in 1993 is expected to be approximately ____ million pounds. Asbestos consumption,
17 pounds of asbestos used per ton of chlorine produced, has been reduced through such
18 technological advances as improved brine purification techniques, use of dimensionally
19 stable anodes and polymer bonded diaphragms.

20
21 Asbestos is the universally accepted material for chlor-alkali cell diaphragms. By
22 following safe handling procedures and complying with governmental regulations,
23 asbestos can be handled, used, and disposed of safely.

1 3. REGULATIONS

2
3 3.1 UNITED STATES

4
5 3.1.1 Asbestos Standard (OSHA 29 CFR Part 1910.1001)

6
7 The following briefly summarizes the Asbestos Standard, but is not a comprehensive
8 review.

9
10 The Asbestos Standard:

11
12 Establishes a PEL (0.2 fibers/cc of air) and an action level (0.1 fibers/cc of air). Fibers
13 are defined as particles five micrometers or longer with a length to diameter ratio of at
14 least three to one.

15
16 Establishes methods for collecting industrial hygiene monitoring samples, analyzing
17 samples and communicating sample results to employees. The standard also specifies
18 the frequency with which samples must be collected and when increased or decreased
19 sampling may be appropriate. It also permits employees or their designated
20 representative to observe the monitoring.

21
22 Establishes regulated areas which must be demarcated from the rest of the workplace,
23 have limited access, and require personnel entering the regulated area to wear respiratory

1 protection. Eating, drinking smoking, using smokeless tobaccos, chewing gum or
2 applying cosmetics are prohibited in any regulated area.

3
4 Prescribes various methods of compliance, including engineering controls and work
5 practice techniques. If the PEL is exceeded, a written compliance program must then
6 be developed which identifies how exposure levels will be reduced.

7
8 Describes the situations where a respirator must be worn, type of respirator to be worn,
9 requirements of the respiratory protection program, and respirator fit testing.

10
11 Identifies the type of protective work clothing and equipment which must be provided
12 if the PEL is exceeded, and the appropriate handling, storage, cleaning, replacement
13 and disposal practices for the clothing and equipment.

14
15 Identifies requirements for change rooms, showers and lunchrooms, if the PEL is
16 exceeded.

17
18 Prescribes specifications for warning signs, labels and MSDSs. Additionally, for all
19 employees exposed to asbestos at or above the action level, employee training
20 requirements and frequency are specified.

21
22 Establishes certain housekeeping requirements, including waste disposal.

1 Specifies preplacement, annual and termination medical examinations and the transfer of
2 information to the examining physician regarding the Asbestos Standard, employee work
3 duties, exposure levels, personal protective equipment use and previous medial exam
4 results. The Asbestos Standard requires the examining physician to submit a written
5 opinion on each affected employee's ability to perform the identified work duties and to
6 identify limitations the employee should follow. The Asbestos Standard also requires the
7 physician to inform employees of examination results. The medical examination
8 requirements apply to employees exposed at or above the action level.

9
10 Establishes certain recordkeeping requirements regarding exposure measurements,
11 medical surveillance, training and transferring of records.

12
13 3.1.2 OSHA Hazard Communication Standard 1910.1200

14
15 This regulation is commonly known as the worker right to know law. It establishes
16 guidelines for facilities to follow that handle hazardous substances. Asbestos is regulated
17 under OSHA 1910.1200 as a hazardous substance. In addition there are specific asbestos
18 regulations for asbestos use in the workplace 1910.1001.

19
20 3.1.3 OSHA 1910.120(q) Emergency Response (as appropriate)

3.1.4 EPA - EPCRA

The Emergency Planning and Community Right to Know Act of 1986 (EPCRA) is also known as Title III of the Superfund Amendments and Reauthorization Act. Asbestos is regulated under EPCRA as a substance classified as extremely hazardous. There are several sections of the Act that affect facilities that manufacture chlorine utilizing asbestos diaphragm technology.

Sections 301 - 303, 305: Emergency Planning

Require facilities to prepare emergency response plans and designate an Emergency Coordinator.

Extremely Hazardous Chemical list and Reportable Quantities (RQ) were established.

Section 304: Emergency Notification

Release of a quantity equal to or greater than the reportable quantity (RQ) triggers immediate notification to the National Response Center (NRC) and State and local agencies. The RQ for asbestos is 1 pound.

Section 311: Submission of MSDS forms to emergency regulatory agencies.

1 Section 312: Annual Inventory of extremely hazardous substances.

2
3 Section 313: Annual Toxic Chemical Release Inventory - Form R Reports

4
5 3.1.5 EPA - Air (40 CFR Part 61)

6
7 Asbestos is a designated hazardous air pollutant under the Clean Air Act and is regulated
8 under the National Emission Standard for Hazardous Air Pollutants (NESHAP). Certain
9 aspects of asbestos waste disposal standards are addressed in these regulations.

10
11 In summary, the regulations require an owner/operator of a chlorine manufacturing
12 facility utilizing asbestos diaphragm cell technology to:

13
14 Either discharge no visible emissions to the outside air, or use specified methods to clean
15 emissions containing asbestos before the emissions are vented to outside air. Air
16 cleaning devices may require daily monitoring, weekly inspections and documentation.
17 All visible emissions must be reported to the EPA quarterly.

18
19 Deposit all asbestos-containing waste material from chlor-alkali operations at waste
20 disposal sites operated in accordance with regulations and discharge no visible emission
21 to the outside air during each stage of disposal or use of specified disposal methods.

22
23 Asbestos from chlor-alkali facilities must be adequately wetted and wrapped in leak-

1 tight materials. Containers are used to transport debris. Large pieces may be wrapped
2 in leak tight materials. All containers must be labelled with the OSHA warning label
3 and the generator's name and address. Most states require the use of manifests for
4 asbestos waste transportation. There must be a competent supervisor on site during any
5 asbestos activities.

6
7 Submit information regarding asbestos emissions disposal practices, etc. to the EPA.

8
9 3.1.6 EPA - Water (40 CFR Part 415)

10
11 Effluent limitations applicable to the chlor-alkali industry are not specific for asbestos,
12 although there are restrictions on the discharge of suspended solids. These regulations
13 are promulgated under the Clean Water Act.

14
15 3.1.7 EPA - Toxic Substances Control Act (40 CFR Part 763)

16
17 Regulations promulgated under the Toxic Substances Control Act impose reporting
18 obligations on manufacturers, importers or processors of asbestos. In summary, the
19 regulations require information regarding production, import and export of bulk asbestos
20 and/or asbestos mixtures, current worker exposures, pollution control equipment used
21 to control asbestos emissions, amount of waste and disposal practices.

3.1.8 DOT - Hazardous Materials (49 CFR Part 173)

Regulations promulgated under the Hazardous Materials Transportation Act address commercial shipments of asbestos. In summary, the regulations require that asbestos be loaded, handled and unloaded in a manner to minimize occupational exposure to airborne asbestos particles. Individual States also may have asbestos requirements which must be met.

3.2 CANADA

The Western hemisphere's largest asbestos producer, Canada, supplies about 35 percent of worldwide production.

3.2.1 Canadian Workplace Standards

Federal legislation applies only to federal facilities. There is no federal legislation specific to asbestos. Provincial legislation specific to workplace asbestos is effective only in the provinces of Alberta, British Columbia and Ontario. In Quebec each workplace must submit a control program for approval by the Quebec Health and Safety Commission, although the maximum allowable exposure level is set at 0.5 fibers/cc. All other provinces require compliance with the current ACGIH threshold limit value.

Note to EHC-- We need to confirm 3.2.1 and 3.2.2 are still correct.

3.2.2 Canadian Environmental Regulations

When transporting asbestos, disposing of asbestos wastes, or where the potential exists for release of asbestos into the environment, the requirements of federal and provincial regulations must be followed.

4. CONTROL PROCEDURES

4.1 GENERAL

This section addresses safe handling and disposal practices of asbestos in the chlor-alkali industry. Examples of satisfactory asbestos control practices are only illustrative and should not be construed to have universal applicability or to represent the only available or suitable practices.

4.2 PURCHASING

When asbestos is ordered in bags, purchase orders should require the vendor to have palletized asbestos in bags in the rail car or truck, and cover the palletized bags with shrink-wrapped, stretch-wrapped or other nonporous material. This procedure minimizes the likelihood of torn bags or loose material and promotes ease of movement.

4.3 RECEIVING

4.3.1 Inspection

The asbestos shipment should be inspected before unloading. The individual inspecting the shipment should have an approved respirator and suitable protective clothing readily available.

4.3.2 Clean-up

If broken bags or loose asbestos are evident, the individuals cleaning up the spill must wear approved respirators and suitable protective clothing. Broken bags should be enclosed in a heavy duty plastic bag. A HEPA filter-equipped vacuum cleaner should be used for cleanup before unloading proceeds. Where possible, water should be used to wash down and collect any loose asbestos. All other individuals should be kept from the area until cleanup is completed.

4.3.3 Unloading

When moving asbestos to storage, it is important to prevent the puncturing of bags. The unloading operator should have an approved respirator and appropriate protective clothing readily available.

4.4 STORAGE

An appropriate storage area is an important element of the asbestos handling program and its design should be carefully planned. Ideally, asbestos should be stored in an isolated and enclosed area with restricted access and appropriate OSHA-specified warning signs.

If an access way exists between the asbestos storage area and the major work area of a cell renewal operation, it should have a well-fitted door. The door should remain closed at all times and should be marked with appropriate OSHA-specified warning signs.

Another means of storage is the "assigned" railroad car. The rail car should be marked with appropriate OSHA-specified warning signs.

The storage area should be kept clean and free of loose asbestos fiber. Wooden pallets should not be allowed to accumulate in the storage area. Any area or surface showing signs of asbestos, whether on floors, walls, or pallets, should be cleaned with a HEPA filter-equipped vacuum cleaner. The asbestos waste, vacuum bag and filter should be enclosed in a labeled, heavy plastic bag or other impervious container and disposed. The asbestos may also be washed into a collection system or wetted down and recovered.

Periodic inspections of the storage area are recommended.

4.5 DIAPHRAGM DEPOSITING AND TREATMENT

Exposure to asbestos can occur when asbestos is being prepared for use in making diaphragms.

Damaged bags should be contained before transport to the point of use. A large heavy duty plastic bag should be used to contain any broken bag during transport. Personnel in direct contact with asbestos should wear an approved respirator and suitable protective clothing.

Asbestos bag cutting and emptying should be performed under a vacuum vented hood or within an enclosed system. Transferring asbestos into a slurry tank should be performed under a vacuum vented or enclosed system to contain asbestos.

At times, it may be necessary to add asbestos slurry to an operating cell. Spilling the treatment slurry should be prevented to avoid contaminating the work area. Any spillage should be promptly cleaned up.

4.5.1 Sorting and Weighing

Asbestos bags should be opened within a vacuum-vented or enclosed system. Bags should be fully cut and carefully emptied with minimal disturbance of the contents. Bags should never be shaken. Delumping of asbestos and emptying of bags should be

1 done cautiously to prevent asbestos release.

2
3 Empty bags should be folded over the cut within a vacuum-vented or enclosed system
4 and be deposited in a closed labeled container.

5
6 When only partial contents of a bag are required, the partially filled bag should be stored
7 within the vacuum vented hood or enclosed system. If partially filled bags must be
8 moved outside the vacuum vented hood or enclosed system, they should be resealed
9 before moving.

10
11 4.5.2 Protective Equipment

12
13 Workers involved in the physical handling of asbestos bag transfer and slitting, sorting,
14 weighing and slurry-preparation operations should wear approved NIOSH / MSHA
15 respirators and suitable protective clothing.

16
17 4.5.3 Housekeeping

18
19 There should be no visible asbestos. Compressed air should not be used to clean up
20 loose asbestos. Fugitive asbestos fibers must be removed with a HEPA filter-equipped
21 vacuum cleaner or by wet cleaning.

4.6 PURCHASED PREDEPOSITED ASBESTOS DIAPHRAGMS

4.6.1 Storage

Purchased predeposited diaphragms should be placed on pallets with protective plastic covering or stored in the cell frame assembly. The properly protected diaphragms should be stored in a designated area.

4.6.2 Shipping, Receiving and Assembly

Predeposited diaphragms should be shipped on pallets with protective plastic covering or in containers designed to hold the diaphragms. Personnel should wear the proper safety equipment when handling diaphragms during shipping, receiving and cell assembly.

4.7 SPENT ASBESTOS

4.7.1 Hydroblast Area

Asbestos diaphragms are removed by hydroblasting and replaced at some frequency, depending on cell type, brine quality, and other variables.

The hydroblast area should be enclosed and have smooth surfaces to prevent asbestos

1 from adhering and drying. The area should also contain a trench system for receiving
2 and carrying away the asbestos and contaminated water to a sump or pit. A sloping
3 concrete floor facilitates drainage. After each use of the hydroblast area and at the end
4 of the work day, all surfaces should be carefully flushed to remove all asbestos. Where
5 appropriate, the area can be initially cleaned with a squeegee. Final wash down would
6 then require a minimal quantity of water.

7
8 4.7.2 Water Separation

9
10 Separation of spent asbestos from the hydroblasting water wash is typically accomplished
11 by pond settling, separation tanks or filtering, e.g. plate and frame filters.

12
13 4.7.3 Landfills

14
15 Landfills which accept asbestos wastes are regulated by EPA and have specific
16 recordkeeping requirements.

17
18
19 5. EMPLOYEE PROTECTION

20
21 5.1 GENERAL

22
23 Asbestos can cause serious health problems if it is not properly used and handled.

Asbestos exposure may cause such diseases as pulmonary fibrosis, carcinoma and pleural mesothelioma. However, quantifying the health risks associated with specific airborne concentrations, fiber types and dimensions, and the chemical composition of the fibers, is an inexact process. In addition, the long latency period between initial exposure and the appearance of disease complicates risk estimates. Consequently, exposure should be kept at or below the PEL.

The Asbestos Standard requires that engineering controls such as exhaust ventilation and dust collection be used to maintain exposures at or below permissible levels. To the extent practicable, the Standard also requires that asbestos be handled in a wet state to prevent the emission of airborne fibers in excess of the PEL.

Compliance must be achieved by instituting engineering controls and work practices, except when such controls are not feasible. In that event, the engineering controls and work practices shall be used to reduce exposure to the lowest levels achievable and those controls shall be supplemented by the use of respirators.

5.2 WARNING SIGNS AND LABELS

Warning signs with OSHA-specified language must be displayed at all regulated areas and all approaches to these areas, and at and around asbestos waste disposal sites. Some States may also have labelling requirements for tracking/identifying.

1 The Asbestos Standard requires that warning labels with OSHA-specified language be
2 affixed to all raw materials, mixtures, scrap, waste, debris, etc. containing asbestos, or
3 to asbestos waste containers destined for disposal. States may also have generator
4 identification number requirements.

5
6 5.3 RESPIRATORS

7
8 Where their use is required, respirators must be approved by the Mine Safety and Health
9 Administration and the National Institute of Occupational Safety and Health.

10
11 OSHA Act regulations (reference 6) require employers to establish respiratory protection
12 programs.

13
14 Employees must wear approved respirators whenever exposures cannot be effectively
15 reduced by engineering controls and asbestos exceeds or is likely to exceed the PEL.
16 The Institute provides information for respiratory protection in Pamphlet 75
17 (reference 7).

18
19 5.4 PROTECTIVE CLOTHING

20
21 Any worker exposed to asbestos in excess of the PEL must wear protective clothing such
22 as coveralls (or similar whole body clothing) and head, hand and foot coverings. The
23 protective clothing, which must be provided by the employer, should not contain pockets

or side openings.

Employers may prefer to provide disposable coveralls, although reusable ones are permitted. For reusable coveralls, anti-static, cotton polyester fabric of fine weave has proven a satisfactory material. Laundering should be done to prevent release to the ambient air of adhered asbestos fibers. If contract laundering is used, the employer must inform the launderer, preferably in writing, of the applicable regulations. Contract launderers should be periodically inspected.

Soiled protective clothing, whether reusable or disposable, should be placed in labeled and sealed impermeable containers. Water-soluble laundry bags may minimize the exposure potential in handling operations.

Once worn, disposable protective clothing should be considered contaminated with asbestos and properly disposed. Reusable clothing, once worn, if contaminated, should be HEPA filter-vacuumed before placing in laundry containers. Clothing must not be shaken, brushed, or air blown.

5.5 CHANGE ROOMS

Employers must provide change rooms for workers who are exposed to asbestos in excess of the PEL. Change rooms, which should be separate from other facilities, including break rooms, offices, etc., must be equipped with two separate lockers or other containers for each worker to prevent contamination of the worker's street clothes. If

disposable clothing is worn, it should be placed in the disposal container and the worker should then enter the shower area.

6. INDUSTRIAL HYGIENE MONITORING

An effective monitoring program identifies employee exposure and aids in developing practices to reduce that exposure.

6.1 EXPOSURE MONITORING

The Asbestos Standard requires initial and periodic exposure monitoring for employees who are exposed or may reasonably be expected to be exposed to asbestos concentrations at or above the action level. Monitoring is also required when work practice, equipment or personnel change could result in new exposures above the action level. Reference 6 contains a detailed description of the exposure monitoring procedures. All affected facilities should develop an industrial hygiene monitoring program for asbestos and audit it to insure compliance with regulations and company policy.

6.2 EMPLOYEE NOTIFICATION

The affected employee must be notified in writing of any monitoring results within 15 days of the employer's receipt of the results. If the exposure exceeds the PEL, written notice must include the corrective steps necessary to reduce exposure to, at or below the PEL.

6.3 RECORDS

Exposure monitoring records must be kept for at least 30 years. Additional requirements for monitoring records are included in the Asbestos Standard and other OSHA Act regulations such as 29 CFR 1910.120 (reference 8).

7. MEDICAL SURVEILLANCE

The OSHA Asbestos Standard (Reference 1) requires employers to institute a medical surveillance program for all employees exposed to asbestos at or above the action level.

7.1 PREPLACEMENT EXAMINATIONS

The employer must make available a preplacement medical examination before the employee is exposed to asbestos. At a minimum, the examination must include: medical and work history, complete physical exam, completion of the specified questionnaire, chest X-ray, and pulmonary function test.

7.2 PERIODIC EXAMINATION

For employees exposed to asbestos at or above the action level, an annual medical surveillance examination must be made available. It is nearly identical to the

preplacement examination except that the frequency of chest X-rays depends on age and years since first exposure.

7.3 TERMINATION EXAMINATIONS

Within 30 days before or after termination, the employer must make available a medical examination to workers exposed to asbestos at or above the action level. If the employee received the OSHA-designated examination within the past year, a termination examination is not required.

7.4 PHYSICIAN'S INVOLVEMENT

The employer must provide to the physician information which includes, in part, the employee's job duties, exposure levels, and protective equipment requirements. The employer must obtain from the physician a written, signed opinion which includes potential risks to the employee, recommended limitations and a statement that the employee has been informed of the examination results.

7.5 EMPLOYEE NOTIFICATION

The employer must provide a copy of the physician's written opinion to the affected employee within 30 days of its receipt.

9. REFERENCES

1. Code of Federal Regulations 29 CFR Part 1910.1001, ASbestos Standards.
2. Code of Federal Regulations 40 CFR Part 61, Clean Air Act Regulations.
3. Code of Federal Regulations 40 CFR Part 415, Clean Water Act Regulations.
4. Code of Federal Regulations 40 CFR Part 763, Toxic Substances Control Act Regulations.
5. Code of Federal Regulations 49 CFR Part 173, Hazardous Materials Transportation Act Regulations.
6. Code of Federal Regulations 29 CFR Part 1910.134, Respiratory Protection.
7. Pamphlet 75, Respiratory Protection Guidelines for Chlor-Alkali Manufacturing Facilities, Edition 2, May, 1993, The Chlorine Institute, Inc.
8. Code of Federal Regulations 29 CFR 1910.20, Access to Exposure and Medical Research.

1 7.6 RECORDS

2
3 Medical surveillance records must be retained for the duration of the individual's
4 employment plus 30 years.
5

6
7 8. EMPLOYEE TRAINING

8
9 A well-designed and well-conducted employee training program is an essential part of
10 providing a safe work environment.
11

12 8.1 OPERATING

13
14 Workers who may be exposed to asbestos should receive detailed written operating
15 instruction specific to their duties. These instructions should include appropriate
16 procedures for moving and handling asbestos and clean up practices.
17

18 8.2 TRAINING

19
20 Initial and annual training for employees exposed to asbestos at or above the action level
21 is required.

The training program must include:

- health effects of asbestos exposure
- the risks to asbestos workers who smoke
- the quantity, location, manner of use, release and storage of asbestos, and which operations could result in exposure
- engineering controls and work practices
- procedures to be implemented to protect employees from exposure
- purpose, use, and limitations of respirators and protective clothing
- purpose and description of the medical surveillance program
- review of the Applicable Standards (asbestos, OHSA, EPA, DOT, State)

8.3 CONTRACTORS

When contract employees may be exposed to asbestos, the contracting company must be informed of the presence and hazards of asbestos.

8.4 RECORDS

Employee training records must be maintained for the duration of employment plus one year.

9. REFERENCES

1. Code of Federal Regulations 29 CFR Part 1910.1001, ASbestos Standards.
2. Code of Federal Regulations 40 CFR Part 61, Clean Air Act Regulations.
3. Code of Federal Regulations 40 CFR Part 415, Clean Water Act Regulations.
4. Code of Federal Regulations 40 CFR Part 763, Toxic Substances Control Act Regulations.
5. Code of Federal Regulations 49 CFR Part 173, Hazardous Materials Transportation Act Regulations.
6. Code of Federal Regulations 29 CFR Part 1910.134, Respiratory Protection.
7. Pamphlet 75, Respiratory Protection Guidelines for Chlor-Alkali Manufacturing Facilities, Edition 2, May, 1993, The Chlorine Institute, Inc.
8. Code of Federal Regulations 29 CFR 1910.20, Access to Exposure and Medical Research.