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Date: November 9, 1972

To: See Below List

From: J. M. Bachman

Subject: ASBESTOS EXPOSURE CONTROL MODEL PLANT REGULATION

This is the final Asbestos Exposure Control Model Plant Regulation. There will be some training materials coming out in the near future. Please read over this regulation when you have a chance and refer any further comments you have to me. The regulation should be put into effect in the manner that we have previously discussed.

J. M. Bachman

JMB:mlr

cc: C. J. Boemer
L. C. Brown
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ASBESTOS EXPOSURE CONTROL

MODEL PLANT REGULATION

SECTION	TITLE
100	Nature of Hazard and Toxicity
200	Scope of Regulation
300	Responsibility
400	Permissible Exposure
500	Determination of Exposure
600	Engineering Controls
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1000	Medical Surveillance
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ASBESTOS EXPOSURE CONTROL

MODEL PLANT REGULATION

100: NATURE OF HAZARD & TOXICITY

101 - Regular inhalation of airborne asbestos dust in excessive concentrations may result in a lung disease called "asbestosis". Asbestosis may take as long as 20-30 years to develop in an exposed individual without showing any warning symptoms in its early stages. In its more advanced stages, asbestosis significantly reduces the ability of the lungs to perform their air exchange function. Eventually, an individual becomes short of breath to the point of actual lung disability. Cough, general weakness, loss of weight, and chest pain may also be seen as symptoms.

Asbestos may also be a carcinogen, i.e., a cancer causing agent. Exposure to excessive concentrations of asbestos dust over extended periods of time may be causally related to lung cancer development. The risk of cancer from asbestos is dramatically increased by smoking. Again, there is a time lapse of several years between the exposure and the onset of cancer symptoms.

102 - Asbestos poses a potential health hazard at every work location where asbestos or an asbestos containing material is being handled. Exposure to asbestos dust will most likely occur to insulators in manufacturing facilities during demolition, fabrication and covering, and mixing of insulation cement. Employees other than insulators, such as maintenance people or operators, may also experience exposure if they are working nearby.

Asbestos is being included as a constituent in some products. Such handling and processing may result in employee exposure. Exposure may also occur at vehicle maintenance garages during work on brakes. Since brake linings may contain as much as 95% asbestos, the cleaning and preparation of brake drums for new linings may generate excessive dust concentrations.

In some cases, during contracted insulation work a hazard may be generated which will affect Atlantic Richfield employees. Efforts should be made through the contractor liaison engineer to minimize dust generation and employee exposure.

200: SCOPE OF REGULATION

201 - This regulation is intended to govern all use of asbestos containing materials, including use during insulation operations (e.g., demolition, fabricating, covering, spraying, and cement

mixing). Asbestos containing materials are most likely to be insulation (in block, cylindrical or prefabricated form), insulation cement, and transite. Other materials used on an incidental basis are also included. Special cases such as maintenance work on vehicle brake linings are also governed under this regulation.

300: RESPONSIBILITY

301 - The SUPERVISOR has the responsibility: (a) of knowing where and on what jobs asbestos is being used in his area; (b) of training and educating his workers in the hazard and proper work practices for handling asbestos; (c) of alerting the Safety Section of a potential exposure which may require monitoring.

302 - The SAFETY UNIT has responsibility for (a) monitoring asbestos exposure; (b) developing training programs; (c) maintaining certain records as defined in subsequent paragraphs.

303 - The MEDICAL UNIT has responsibility for (a) arranging physical examinations; (b) interpreting and evaluating their results; and (c) maintaining records of physical examination.

304 - The EMPLOYEE RELATIONS UNIT has the responsibility for (a) making sure that employees are notified of over exposures and (b) handling reassignments of employees who are physically unable to wear respirators.

305 - The CORPORATE SAFETY GROUP has the responsibility for (a) assisting in setting up a control program; (b) monitoring effectiveness of the program; (c) providing advice and counsel when needed; and (d) providing certification of individuals assigned to taking air samples.

400: PERMISSIBLE EXPOSURE

401 - Atlantic Richfield Company has established the following exposure standard:

The 8 hour time weighted average to which any employee may be exposed shall not exceed 2 fibers longer than 5 micrometers per cubic centimeter of air sampled. Further, no employee shall be exposed to a concentration in excess of 10 fibers longer than 5 micrometers per cubic centimeter of air being sampled.

402 - The Atlantic Richfield Company permissible exposure standard is equal to or more stringent than the Occupational Safety and Health Administration standard, as published in Part 1910.93a.

500: DETERMINATION OF EXPOSURE

501 - An initial asbestos survey shall be conducted at each Atlantic Richfield facility where asbestos fibers may be released into the air.

502 - Initial industrial hygiene surveys will reveal job activities such as demolition and sawing, which may generate asbestos dust concentrations in excess of the permissable exposure as stated in paragraph 400. In such activities, subsequent surveys must be conducted at least every six months, until the exposure standards are met.

503 - The Safety Unit should maintain a list of activities where exposure may exceed the standard of paragraph 401 in order to schedule regular surveys and to identify job assignments which may require engineering control, work practice control, personal protective equipment, record keeping, medical surveillance and training.

504 - The Safety Unit should maintain a list of employees whose exposure may exceed the standard of paragraph 401.

505 - Use the equipment specified in Appendix C or its equivalent approved by the Corporate Hygiene Engineer, for air sampling.

506 - Use the procedure outlined in Appendix B to conduct the air sampling.

507 - Submit all air samples to the Director of Analytical Services at the Harvey Technical Center, 400 East Sibley Boulevard, Harvey, Illinois, for analysis. In some cases, special arrangements may be made for the analysis to be conducted at the Product Quality Laboratory if acceptable to the Corporate Hygiene Engineer.

508 - Document all air sampling activities, indicating when, where, who sampled, who observed, equipment used, etc. This information shall be entered in a log similar to the sample in Appendix D.

509 - Enter the names of employees observing the air sampling in the log described in paragraph 508.

510 - Any employee who is found to have been over exposed (i.e., without respiratory protection) as specified in Part 1910.93a of the Federal Occupational Safety and Health Act, by law must be notified in writing.

600: ENGINEERING CONTROLS

601 - Substitute materials such as non-asbestos insulation should be specified and used in place of asbestos whenever feasible.

602 - Engineering control methods such as well designed local exhaust ventilation, job isolation and enclosure, and dust collection equipment are to be used as the primary means of control of dust generation.

603 - Ventilation systems shall be constructed in accordance with ANSI Z9.2-1971. The Industrial Ventilation Manual prepared by the American Conference of Governmental Industrial Hygienists (A.C.G.I.H.) should be consulted for additional design information.

604 - Fabrication of asbestos components should be done at a centralized location to the extent practicable. A centralized fabrication shop facilitates the use of local exhaust ventilation on power tools, ventilated work areas for use of hand tools, and general ventilation.

605 - Local exhaust equipment, such as portable vacuum equipment, should be used when cutting or sawing asbestos materials with power or hand tools.

700: WORK PRACTICES CONTROLS

701 - All materials containing asbestos must be kept in closed containers prior to fabrication and application. The original containers are satisfactory. If asbestos material is removed from the original container, it must be placed in some other container, such as a plastic bag, or replaced in the original container for transportation and storage. A cautionary label, as specified in Appendix F, shall be attached to any container not already provided with one.

702 - All materials containing asbestos should be wetted insofar as practicable prior to handling or fabrication operations, such as cutting and sawing. Existing insulation containing asbestos should be wetted insofar as practicable before removing, stripping or demolition procedures are started. Care should be taken when using wet methods to avoid creating a slipping hazard.

703 - Use vacuum for cleaning rather than compressed air.

704 - Maintain good housekeeping procedures in order to avoid buildup of dust on machines, piping, or other work locations.

705 - Personnel access to areas where exposure may exceed the standard of paragraph 401 shall be controlled by placement of warning signs and/or ropes while work is in progress. Warnings signs shall be at least 20" X 14" of (yellow) background with black letters; and of design similar to sample in Appendix G.

706 - Keep all scrap materials containing asbestos in plastic bags or other closed containers prior to disposal. A cautionary label, as given in Appendix F, shall be attached.

707 - When asbestos cement must be used, it should be charged to the mixing container, and mixed in such a manner so as to cause a minimum of dust generation.

800: PERSONAL PROTECTIVE EQUIPMENT

801 - Respiratory protection to control exposure below the standard of paragraph 401 shall be used only as a temporary measure while engineering control measures are being installed, while improved work practices are being developed and instituted, when engineering or work practices control is not feasible, or during emergencies.

802 - When use of a respirator is permitted by Par. 801, it shall be selected from among those approved by the Bureau of Mines or the National Institute for Occupational Safety and Health under the provisions of 30 CFR, Part II (Federal Register 37:6244, March 25, 1972).

803 - When use of respirators, as well as personnel rotation, are allowed by Par. 801, and when both are feasible, personnel rotation shall be preferred and used.

804 - When use of a respirator is permitted by Par. 801, the type of respirator used will depend on the asbestos fiber concentration based on the expected 8 hour time weighted average.

805 - A disposable or cartridge type respirator shall be used when permitted by Par. 801 and when the expected 8 hour time weighted average is greater than 2 fibers longer than 5 micrometers per c.c. of air sampled and less than 20 fibers longer than 5 micrometers per c.c. of air sampled or when the expected concentration is greater than 10 fibers, but less than 100 fibers, longer than 5 micrometers per c.c. of air sampled at any time.

806 - A powered air purifying respirator shall be used when permitted by Par. 801 and when the expected 8 hour time weighted average is greater than 20 fibers longer than 5 micrometers per c.c. of air sampled and less than 200 fibers longer than 5 micrometers per c.c. of air sampled or when the expected maximum concentration is greater than 100 fibers, but less than 1,000 fibers longer than 5 micrometers per c.c. of air sampled at any time.

807 - A Type "C" continuous flow, or a pressure-demand supplied-air respirator, shall be used when permitted by Par. 801 and when the expected 8 hour time weighted average is greater than 200 fibers longer than 5 micrometers per c.c. of air samples or when the expected maximum concentration is greater than 1,000 fibers longer than 5 micrometers per c.c. of air sampled at any time.

808 - When respirators are used under Pars. 805, 806, or 807, and effective respirator program, meeting the standards of ANSI Z 88.2 - 1969 shall be established. The program shall insure that fitting, testing, replacing, and maintaining of respirators is effectively carried out.

809 - When, on the recommendation of a medical doctor, a worker should not wear a respirator due to his personal condition of health, the matter should be referred to the Employee Relations section. Special federal regulations may apply to this assignment to another job. Reference should be made to Part 1910.93, d, 2, iv(c), OSHA Standards.

810 - Special clothing, such as coveralls, head coverings, gloves, and foot coverings shall be provided and used whenever an employee regularly works in an area where exposure exceeds the standard (paragraph 401). Where practical, laundering of all such special garments shall be provided.

811 - Change rooms with double lockers shall be provided for employees regularly working in an area where exposure exceeds the standard (paragraph 401).

812 - Persons handling the clothes provided in accordance with Par. 810 for the purpose of laundering shall be informed of the nature of the hazard of the contaminated clothes, and be given instructions in method of laundering so as to prevent the generation of and exposure to asbestos dust.

900: RECORD KEEPING

901 - All air sampling conducted in accordance with Section 500 shall be logged. A sample log, such as given in Appendix D, should be used.

902 - Log of air sampling shall be retained in the Safety Office for three years.

903 - Copies of air sampling log shall be made available upon request to authorized representatives of Occupational Safety and Health Administration or National Institute of Occupational Safety and Health.

904 - Any employee or former employee may see air sampling logs which indicate his own exposure to asbestos fibers.

905 - Medical records of any physical examinations taken in accordance with Section 1000 shall be kept confidential and retained by the Medical Unit. Upon written request of the employee, a copy of his personal asbestos examination records shall be sent to his personal physician. Medical records must be retained for at least 20 years.

906 - The Safety Unit shall maintain a current list of job activities both permanent and temporary where exposure to asbestos dust may exceed permissable limits as outlined in paragraph 503.

907 - The Safety Unit shall maintain a list of workers who may be exposed to excessive asbestos dust concentrations as required by paragraph 504. The list should be in a form similar to that presented in Appendix A.

1000: MEDICAL SURVEILLANCE

1001 - Any incident of employee exposure to concentrations in excess of the permissible limits given in Section 400 shall be referred to the Medical Unit for possible physical examination.

1002 - Employees regularly exposed to asbestos dust by virtue of job assignment (i.e., those on log of Par. 503) should receive an asbestos examination when first beginning work assignment in the exposed area, when employment is terminated, and annually in between. The Medical Unit should schedule the examination.

1003 - The asbestos physical examination shall be administered and interpreted by the Medical Unit if, in their opinion, it is warranted by the exposure and legal requirements.

1004 - The asbestos examination shall include a chest X-Ray (posterior - anterior 14 X 17 inches), medical history, forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$).

1005 - A special asbestos physical examination shall not be required if an employee has been examined in accordance with this section within the past one-year period.

1006 - In the event that medical examinations indicate illness which may be attributable to asbestos exposure, the Employee Relations Manager as well as the Corp. Manager of Industrial and Labor Relations shall be notified.

1100: TRAINING

1101 - Each Atlantic Richfield facility shall have at least one and Preferably two persons trained to recognize asbestos hazards and in the proper techniques for taking air samples available for the purpose of conducting surveys. Qualified personnel shall receive certification of proficiency in sampling technique from the Corporate Hygiene Engineer after demonstrating competence to him in written and field tests. The Corporate Safety Group will maintain a file on all company personnel so trained and certified.

1102 - All personnel regularly handling asbestos containing materials and either exposed or potentially exposed to asbestos (i.e., those covered by Par. 503) shall receive special instruction at least annually on the hazards and safe handling procedure for asbestos as a part of their regular work group safety

training and safety meetings. Personnel casually exposed to asbestos shall also receive special instruction concerning the hazards and safe handling procedure for asbestos. Minutes of instruction sessions shall be taken and a copy retained by the Safety Section for three years. Employees shall sign a roster to verify their attendence at such training meetings. The roster shall be certified as to accuracy and signed by the supervisor.

1103 - The Safety Unit and the Corporate Hygiene Engineer shall assist supervisors in preparing training materials required by this section.

APPENDIX A

ROSTER OF EMPLOYEES POTENTIALLY EXPOSED TO AIRBORNE ASBESTOS DUST

Name	Social Security Number	Job Title	Work Area	Dates of Work in Exposure Area	
				Start	Stop

ARASB 0088102

AR BRANDES 000122

APPENDIX B

AIR SAMPLING PROCEDURE

1. Assemble the air sampling system, using the equipment listed in Appendix "C"

2. Calibrate the air sampling system:

   (a) Connect a wet test meter (or a calibrated flowmeter) upstream from the filter holder. Set the air flow rate so that the pump flowmeter reads 10 SCFM.

   (b) The flow rate read on the wet test meter (or calibrated flowmeter) will be somewhat less than indicated on the pump flowmeter. Use the air flow rate from the wet test meter (or flowmeter) to calculate the total volume of air sampled. Enter the calibration data on the air sampling log (Appendix D).

3. Select a worker who will wear the air sampling system.

4. Explain purpose and technique to worker.

5. Attach the air sampling system to worker. Pump can be worn on worker's belt over his hip in back. The rubber hose can be extended over his back and shoulder. Attach the filter holder as near as possible to the worker's breathing zone with a clip or tape. Be sure to remove the outer covering of the filter holder. The filter holder must be used in an open-faced mode.

6. Sample should be taken as long as possible to determine the time weighted average. Ideally, eight hours sample time should be used.

7. If impractical to conduct a full-shift test, shorter sample times of a few hours can be used to project the time weighted average for 8 hours.

8. Additional samples should be taken to determine maximum concentrations during a specific job for comparison with the ceiling concentration standard. A minimum sampling time of 5 minutes is acceptable for measuring peak concentration, but a sample can be run as long as a job is being conducted.

9. Additional samples may also be taken in areas in the general area where asbestos is being handled which presents a potential exposure for other employees working nearby.

10. Record the sampling times, type of job being performed, personnel involved, and other pertinent data on the air sampling log. (Appendix D).

APPENDIX B (Cont'd.)

11. Mark and code finished samples clearly with location, date and sample number.

12. Send samples to:

Director of Analytical Services
Atlantic Richfield Company
Harvey Technical Center
400 East Sibley Boulevard
Harvey, Illinois

13. Send a copy of the air sampling log (Appendix D) to the Director of Analytical Services. Be sure the accounting code section of log is filled out.

14. Send a copy of the air sampling log (Appendix D) to:

Corporate Hygiene Engineer
ARCO Plaza Room 4806
515 South Flower Street
Los Angeles, California 90071

15. Enter results of the analysis from Harvey on the air sampling log (Appendix D).

16. At end of a series of tests, recalibrate the sample pump, using wet test meter or other acceptable flow meter. Note result on log.

APPENDIX C

AIR SAMPLING EQUIPMENT

1. Monitaire Air Sampler 0-10 CFH, Catalog No. 92780, available from:

   Mine Safety Appliances Company
   201 North Braddock Avenue
   Pittsburgh, Pa. 15208

2. Aerosol Field Monitor, 37 mm, .8 micron pore size available from:

   Millipore Corporation
   Ashby Road
   Bedford, Mass. 01730

   Catalog MAWP037A0

3. Aerosol Adapter, Millipore Corp., Catalog XX 6200004 (Address above)

4. Miscellaneous Rubber Hoses

5. Flowmeter for field calibration of pump

APPENDIX D

ASBESTOS AIR SAMPLING LOG

e _____ Samples Taken By_____

ation_____ Calibration By_____

ounting Code_____ Analysis By_____

Calibrated With: Pump Flow Rate Calibrated Flow Rate

Flowmeter ☐ Before_____ _____

Wet Test Meter ☐ After_____ _____

ple ber	Sample Time			Calibrated Flow Rate	Total Air Volume Sampled	Work Area Description	Asbestos Concentration	Time Weighted Average	Sample Observed By
	Start	Stop	Elapsed						

ARASB 0088106

AR BRANDES 000126

APPENDIX E

Sample Letter for Notification of Employee Exposure to Asbestos Dust

Dear Mr._____:

Airborne asbestos dust has received increasing attention as a potential health hazard. Atlantic Richfield Company has instituted a company-wide program to evaluate employee exposure to this material and to install controls where tests show their need.

Sampling of air in workplaces where asbestos is used is an important part of the Company's program to determine if exposure exceeds prescribed standard limits. Routine sampling conducted at your workplace on _____, 197_, indicated that you were being exposed to an asbestos fiber concentration in excess of the standard. We wish to notify you of this exposure. A report of the survey of your workplace is in the Safety Manager's office. If you desire to see it, please arrange an appointment through your supervisor.

Because medical evidence linking given concentrations of asbestos dust with various diseases is inconclusive, exposure limits have been set at a low level to provide a maximum protection. Your exposure, although (somewhat) (slightly) above these levels, should not cause adverse health effects.

The source of the exposure which you experienced has been identified and these controls are begin instituted:

a. (Cite any changes in work practices.)

b. (Cite any modifications in equipment.)

c. (Cite any plans to resurvey workplace after correction is made.)

d. (Cite medical tests to be taken, if any.)

APPENDIX F

ASBESTOS CAUTIONARY LABEL

CAUTION

Contains Asbestos Fibers

Avoid Creating Dust

Breathing Asbestos Dust May Cause Serious Bodily Harm

Labels are available from the Corporate Safety Secretary
48th Floor - ARCO Plaza
Los Angeles

APPENDIX G
ASBESTOS WARNING SIGN

CAUTION

ASBESTOS

DUST HAZARD

Avoid Breathing Dust

Wear Assigned Protective Equipment

Do Not Remain In Area Unless
Your Work Requires It

Breathing Asbestos Dust May Be
Hazardous To Your Health