

WH-402

East Pittsburgh, Pa. 15112

10 76-31

ASBESTOS IN LRA
PROGRESS REPORT

Proprietary Class 2

Abstract

A program was developed to eliminate the use of asbestos products in LRA. Replacement materials have been obtained for most items and evaluation of these materials continue.

Brake shoe and gasket items require future effort because of the unavailability of replacement materials.

C. R. Ruffing
Insulation Development Engineering
Large Rotating Apparatus Division

August 24, 1976

Approved:

J. C. Botts 8/25/76
J. C. Botts
Manager, Ins. Dev. Engrg.

03114788

4500700-0000
IN RE: ABRAMS
by C. R. Ruffing
PROJECT: LRA
DECEMBER 1976
Class: 2

ID 76-31

ASBESTOS IN LRA
PROGRESS REPORT

Proprietary Class 2

TABLE OF CONTENTS

	<u>Page</u>
Background	1
Asbestos in LRA	1
Restrictions	2
The Present Law and Trade Recommendations	3
The LRA Program to Phase Out Asbestos	4
Alternate Materials for LRA	4
Recommendations	4
LRA Program Time - Distribution and Time Table (2 pages)	Appendix I
Asbestos Containing Items Listed by Materials Number	Appendix IIA
Old Materials Numbers and Recommended Replacement	Appendix IIB
Other Suppliers and Representative Materials	Appendix IIC

03114789

850111
IN R.E. ABRAMS
DECEMBER 1992

Proprietary Class 2

The use of asbestos in Westinghouse became restricted by an act of Congress, the Occupational Safety and Health Act which was signed by the President in December 1970. The act became effective in April 1971 with the stated objective of assuring the workers' health and safety on the job. In December 1971 the Secretary of Labor issued a temporary emergency asbestos dust standard and the permanent standard was issued in June 1972.

The National Institute for Occupational Safety and Health (NIOSH) has been instrumental in having the asbestos standards strengthened through its recommendations to OSHA. In all cases, except for temporary emergency standards, public notice is given of proposed changes and hearings are held before the NIOSH recommendations become law.

Asbestos fiber and asbestos containing products have been available as commercial materials since the beginning of the manufacturing industry in this country. Westinghouse up to the present has used plastic molded products, wire insulation, tapes, cement-asbestos board, gaskets, brake shoes, papers, tubing, cloth and many other products containing asbestos reinforcement. The original selection of asbestos for use in electrical apparatus was made because it is fire resistant, a good dielectric, and creep resistant. For many years it was the only inorganic fiber reinforcement available in commercial quantities.

Woven glass products were not introduced till after World War II and the large scale availability of glass mat and cloth molded compositions did not take place until the mid 1950's. Even with the introduction of

03114790

fiber glass, asbestos continued to be used because of unique reinforcement properties.

Asbestos has the ability to break into very fine (finer than fiber glass) fibers when crushed or cut during manufacturing operations. This ability to keep splitting fibers rather than breaking them in short stubby pieces as is the case with glass fiber has now been widely shown to be the most critical factor in asbestos airborne pollution. Also the surface chemistry of asbestos makes it a hazardous substance when absorbed into the body.

The hazard of breathing large quantities of asbestos dust has been known since ancient Rome and written references appear down through history. In the past forty years with the control of tuberculosis and a general increase in life span, asbestos dust has been more widely recognized as an industrial hazard.

The latent effects of asbestos exposure have become evident only in recent years.

LRA, Westinghouse has had a Safe Practice Data Sheet A-20 covering asbestos limits and precautions since 1953. These precautions are similar to those found in present OSHA recommendations with the exception of airborne concentrations which have been reduced under recent federal laws.

Restrictions

Until 1969 control of asbestos dust was related to various state and industry standards some of which were established in the early 1900's.

In 1969 the Walsh-Healy act which applied to public contracts was passed and a 12 fibers/cc standard was placed in effect. The OSHA standard a few years later was set at 5 fibers/cc and was further reduced to 2 fibers/cc in July 1976.

LRA was able to comply with the 5 fibers/cc in the past and it appears that the 2 fibers/cc limit will be met largely by the elimination of asbestos containing raw materials from LRA.

03114791

09000000-10000000
IN RE: ABRAMS

DECEMBER 1992

There is a real possibility that all asbestos products will disappear from the market; even those products which LRA does not grind or machine. There is a proposal for a limit of 0.5 fibers/cc which if it becomes law would for the most part eliminate the use of asbestos in any product.

The Present Law and Trade Recommendations

Without going into details on each item the following list is included so the reader can understand the increased cost associated with using asbestos containing products after July 1976.

1. A maximum allowable fiber concentration has been set as of July 1976 which is very difficult to meet (2 fibers/cc).
2. Equipment should function below the limit of 2 fibers/cc and personal protective devices and clothing may be required.
3. Measurements and monitoring must meet recognized standards.
4. Warning signs and labels are required.
5. Record keeping and medical examinations are required.

In addition the Asbestos Information Association recommends the following list for the workers' personal hygiene.

1. Do not smoke.
2. Wash before eating.
3. Shower after work.
4. Use protective devices and clothing properly.
5. Change to work clothes upon arrival at work and from them at the end of the shift using change rooms.
6. If work clothing is taken home, carry in a bag impermeable to asbestos fibers and wash separately from other clothing. Never shake dusty clothing. Use a washing machine.

03114792

1976
IN RE: ABRAMS
DECEMBER 1992

The LRA Program to Phase Out Asbestos

The Hampton Micarta Division notified LRA in January 1976 that the manufacture of their asbestos containing products would cease July 1, 1976 as a result of the new OSHA requirements. Planning for the phase out of asbestos in LRA started in February. A program was approved (Appendix I) and monthly asbestos committee meetings have been held each month. This program has a scheduled total of 32-1/4 man months to the end of August 1976 involving all Code Engineering, M&P and Development Engineering, Purchasing and Manufacturing. In addition, Industrial Hygiene (R&D) and the Safety Department (LRA) are included in the program. It is planned that after August 1976, a somewhat smaller program will continue into the future because of long time tests of alternate materials and service requirements of machines sold in the past.

Alternate Materials for LRA

Satisfactory materials are available for most items with the major exceptions being brake shoes and gaskets.

These items require separate programs because:

1. Suppliers have no alternates and no new suppliers have been developed through the Purchasing Department effort.
2. A single superseding item cannot be used in gasket applications without examination of each end use because of individual requirements.

A list of active LRA asbestos containing items is found in Appendix II along with alternates and possible alternates. A few very low activity materials which are ordered by manufacturers' name (no Westinghouse number) can be expected to appear at times and they should be brought to the attention of the committee.

Recommendations

1. A review of the asbestos program should be made at the end of six months (September 1976) and revisions made where necessary.

03114793

201100
IN RE: ABRAMS
DECEMBER 1992

2. It is recommended that a smaller effort consisting of Purchasing, Materials Development, Insulation Development and M&P Engineering continue the program into mid 1977.

3. Mr. G. T. Brady, manager of Accident Prevention, E. Pittsburgh, should continue his review of the program and have his representatives follow LRA manufacturing in regard to the small amount of asbestos items which will continue to appear in machines returned for service to East Pittsburgh or serviced in the field.

4. The existing computer programs should be modified to print lists of drawings which show the use of asbestos containing materials and list these drawings by code group so they may be more easily followed.

5. A separate development program for brake shoe and gasket materials should be undertaken.

C.R. Ruffing

C. R. Ruffing

Insulation Development Engineering
Large Rotating Apparatus Division

/eg

03114794

CONFIDENTIAL
ABRAAMS
DECEMBER 1992

REF: ALBRAMS

DECEMBER 1992

03114795

590049879711
REF: ABRAMS

DECEMBER 1992

~~Handwritten signature~~

7299-4569
C 299-5296

Tim Matovich

8-299-4591

C.R. Ruffin
Entered 8/1/83

312 Dancy St.
Pittsburgh, PA 15218
9-371-0789 **03114796**

03114737

Totals - Man Months
Total 32-1/2

	Insulation Dev. Eng.	Mechanical Dev. Eng.	Electrical Dev. Eng.	Materials Dev. Eng.	Large Turbine Gen.	Medium Turbine Gen.	Large Motor	Hydrogenerator	L.R.A. CSHA Rep.	Purchasing Dept.	M & P Dept.	Research Consulting and Testing
(1) Identify LRA Materials which contain asbestos	1				1/4	1/4	1/4	1/4	1/4	1		
(2) Contact Suppliers for the replacement of Asbestos containing items	2	1/4		1/4						4		
(3) Test Program - not Time Dependent	1	1		2							2	1
(4) Monthly Meeting with representative from each LRA group	1	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	
(5) Test Program - Time Dependent - Compression Creep - Abrasion	1/2	1		2							4	4
(6) Reports	1/2											
Totals - Man Months	6	2-1/2	1/4	4-1/2	1/2	1/2	1/2	1/2	1/2	5-1/4	6-1/4	5

LRA ASBESTOS REPLACEMENT FOR OSHA COMPLIANCE

Task	0	1	2	3	4	5	6	Months
(1) Identifying LRA materials which contain asbestos	Δ	Δ						
(2) Contact suppliers for replacement of items in (1)		Δ				Δ		
(3) Testing (not time dependent)			Δ					Δ
(4) Monthly meeting one representative from each code	Δ	Δ	Δ	Δ	Δ		Δ	
(5) Time dependent tests (compression creep) abrasion	Δ							Δ
(6) Letter progress reports		Δ	Δ	Δ	Δ	Δ		Δ (6 Months Progress Report)

0014733

ID 76-31
Page A1-2

DECEMBER 1992

IN RE: ABRAMS #44-0040367

ASBESTOS CONTAINING ITEMS LISTED BY MATERIAL NUMBER

03114739

APPENDIX IIA

ASBESTOS CONTAINING ITEMS LISTED BY MATERIAL NUMBER

44141AJ	phenolic Micarta sheet materials
44141AK	phenolic Micarta sheet materials
44141PA	Micarta tubing
44141JA	Micarta shapes
44141XA	Micarta bars
44341AH	paper phenolic laminate
44641AE	molded composition
44641BX	molded composition
44641CA	brake lining
44641CB	brake lining
44641CC	brake lining
44641CE	brake lining
44641CG	brake lining
45723AA	asbestos neoprene sheet
46316CA	asbestos cement sheet
46316CB	asbestos cement sheet
46316CC	asbestos cement sheet
46316CE	asbestos cement sheet
53311AM	filling cement
53351BA	caulking compound
53351BB	caulking compound
53351BC	caulking compound
53351BD	caulking compound
65711AA	asbestos insulated cable
65711AB	asbestos insulated cable
65711AD	asbestos insulated cable
65711AE	asbestos insulated cable
65711AJ	asbestos insulated cable

03114800

69000000
IN RE: A.B.R.A.M.S.

DECEMBER 1992

APPENDIX IIA

OLD MATERIALS NUMBERS AND RECOMMENDED REPLACEMENT

<u>Asbestos POS</u>		<u>Recommended Material</u>
20403 AB	Asbestos Fibers	Fiberfrax Ceramic Bulk Fiber Carborundum Ceramic Fiber Branch P.O. Box 808 Niagara Falls, N.Y. 14302 \$2.35/lb
41211AA	Asbestos Yarn	#11) Fiberfrax #12) Yarn #14) Carborundum #1824 Fiberglass yarn, asbestos and fiber glass textiles North Wales, Pa. 19454
41511AA	Asbestos Tape	Fiberglass Tape State Width and Thickness - Asbestos and Fiberglass Textiles North Wales, Pa. 19454 M Numbers may exist.
41511BA	Asbestos Cloth	) State thickness required,
41511BB	Asbestos Cloth	) Refrasil 41514GC.
41421BJ	Asbestos Insu- lating Board	Fiberfrax GH Board 1/4" thick \$4-/sq. ft.
41511BL	Asbestos Cloth	State thickness required, Refrasil 41414GC also Fiber glass cloth Hess Goldsmith & Co. State fabric style.
41521AN	Asbestos Tape	Fiber glass tape state width and thickness - Asbestos and Fiber Glass Textiles North Wales, Pa. 19454

03114801

03114801-9944
 IN RE: ABRAMS
 DECEMBER 1992

APPENDIX IIB

OLD MATERIALS NUMBERS AND RECOMMENDED REPLACEMENT

<u>Asbestos PDS</u>		<u>Recommended Material</u>
41521CB	Asbestos Cloth for Varnish Treatment	To be supplied by Bedford on glass cloth ET number later.
41521CR	Asbestos Cloth treated at Irwin	Cancelled. If required in future, a new number required for glass or Refrasil replacement.
41524LD	Asbestos glass composite	.015" thick Nomex and glass cloth laminate supplied by Bedford.
42231AA	Asbestos paper .025" thick and .063" thick	Fiberfrax 970A .020" thick .080" thick 970JH Fiberfrax Ceramic Fiber Paper.
42251AA	Asbestos Sheet Packing	Development materials from Carborundum.
42331AA	Asbestos Paper Sheet	Ceramic Paper Bedford LD4299
42331BD	Asbestos Paper Treated with Silicone Resin Turn Insulation on Field Coils	Ceramic Paper - Bedford
42341BN	Shellac Treated Asbestos Paper	Bedford - Four Items 1. Nomex Adhesive ET1318 2. Nomex M with adhesive ET 1420 3. Ceramic Shellac LD 4297 4. Ceramic Epoxy LD 4298
42351AA	Mill Board Gaskets	Fiberfrax GH Board
42351AG	Mill Board .063"	Fiberfrax GH Board or 6 Ply Ceramic Paper - Bedford LD4299

03114802

1400409 JAN 1991
REF: ABRAMS
DECEMBER 1992

APPENDIX IIB

OLD MATERIALS NUMBERS AND RECOMMENDED REPLACEMENT

<u>Asbestos POS</u>		<u>Recommended Material</u>
44141AA	Asbestos Phenolic Coil Supports in E-31	Hampton Kevlar Phenolic Laminate H24907
44141AB	Asbestos Phenolic Laminate	H24907
44141AC	Asbestos Phenolic Laminate	H24907
44141AD	Asbestos Phenolic Laminate	H24907
44141AE	Asbestos Phenolic Laminate	H24907
44141AJ	Asbestos Phenolic Laminate	H24907
44141AF	Asbestos Phenolic Laminate	H24907
44141AK	Asbestos Phenolic Laminate	H24907
44341AH	Phenolic Asbestos Paper Sheet .062" and .125"	Hampton Phenolic Kevlar H24907 or Phenolic-Ceramic Paper
44641CE	Asbestos-Metallic Friction Block	None available
45723AA	Asbestos Neoprene Sheet Gasket Material Tk. .063, .125, .160, .188	Development of in-house manu- facturing required.

03114803

2/10/1992
IN RE: ABRAMS
DECEMBER 1992

APPENDIX IIB

OLD MATERIALS NUMBERS AND RECOMMENDED REPLACEMENT

<u>Asbestos POS</u>		<u>Recommended Material</u>
46316CA	Asbestos Cement Sheet	Fiberfrax GH Board
46316CE	Asbestos Cement Sheet	Fiberfrax GH Board
46316CJ	Asbestos Cement Sheet	Fiberfrax GH Board
46316CL	Asbestos Cement Sheet	Fiberfrax GH Board
46316CC	Asbestos Cement Sheet	Fiberfrax GH Board
46316CJ	Asbestos Cement Sheet	Fiberfrax GH Board
53311AM	Asbestos Cement In-House	Irwin to use Fiberfax bulk fiber

03114804

170000-994#
IN RE: ABRAMS
DECEMBER 1992

APPENDIX IIC

OTHER SUPPLIERS AND REPRESENTATIVE MATERIALS

<u>Supplier</u>	<u>Material</u>
Johns-Manville	Refractory fiber felt bulk refractory fiber refractory fiber paper ceramic fibers in mat form refractory fiber tape ceramic fibers in blanket form ceramic fibers in bulk form refractory fiber felt Marinite-XL ceramic board
Cerro Wire & Cable Co. Division of Cerro Corp. New Haven, Connecticut 06504	66711FB, High Temperature Glass - Teflon cable
Manning Paper Co. Troy, N.Y. 12181 (518) 273-6320	76-72-28, Inorganic insulating paper
Hampton Works - Westinghouse	Kevlar Laminate H24907
Bedford - Westinghouse	Varnish treated glass LD 4303 (replaces 41521CB)
Hitco 1600 W. 135th Street Gardena, California 90249	41514GC Refrasil amorphous silica cloth
Carborundum Co. P.O.Box 808 Niagara Falls, N.Y. 14302	41311BA Refractory fiber rope "Fiberfrax"
Owens Corning Fiberglas Corp. Toledo 1, Ohio	41314AA Glass cord, tying
E.I. DuPont de Nemours & Co.	42343EA Mica filled polyamide paper
E.I. DuPont de Nemours & Co.	42353BA Uncalendered polyamide paper

03114805

470000-0000
IN RE: ABRAMS
DECEMBER 1992

APPENDIX IIC

OTHER SUPPLIERS AND REPRESENTATIVE MATERIALS

<u>Supplier</u>	<u>Material</u>
Bedford - Westinghouse	Epoxy coated Nomex for strap wound coils — ET1420 resin coated ceramic paper
Southern Mills Inc.	Nomex blanket materials S/1095 S/470 S/619 S/9 (41482AA) (protection against welding sparks)

03114806

5/27/77
IN R.H. ABRAMS

DECEMBER 1992

ID 76-31

ASBESTOS IN LPA
PROGRESS REPORT

Proprietary Class 2

Distribution

East Pittsburgh 11N-S	N. A. Beldecos
4N24	C. R. Marcum
	Route to: 5N-N D. H. Rielly
	5N-S J. D. Davidson
	3N46 J. W. Batchelor
	4N46 W. H. Morse
5N-N	R. M. Sexton
4N-S	P. J. Hillen
3N14	B. B. Winer
	Route to: 6N38 E. H. Myers
	4N-S A. J. Spisak
6N-N	L. W. Finnell
3N66	H. R. Elliott
3GA	A. S. DePaul
	Route to: 2G J. F. Onofrey
	2G A. L. Oblich
	2G S. A. Drinkut
	12L W. P. Iski
	5G F. R. Hoguet
10L	P. R. Heller
	Route to: 12L R. L. Novak
	12L J. G. Myers
	10L L. P. Curtis
	10L E. I. King
2N32	D. L. Donatucci
	Route to: MA Gen'l. D.G. LePere
	3GA O. J. Mitol
	2N49 R. C. Simmers
4G10	G. T. Brady
Irwin	W. R. Watson
6G28	R. F. Crouse
R&D 401-3X9	Z. R. Heasley
501-3Y34	R. N. Sampson
601-2B20	W. M. Day

Members of Asbestos Committee

03114807

Issuing Dept: Insulation
Dev. Engrg.

By C. R. Ruffing

Class 2

Large Rotating Apparatus Division
Technical Document Summary (TDS) Card

The TDS cards is the basic tool for indexing and retrieving technical information throughout Westinghouse. The 3 x 5 card cutouts provide for filing by numbers. Reports are distributed by the issuing department; for a copy use the pre addressed request cutout card. Discard TDS cards not of interest.

PROPRIETARY CLASS 1

Strictly limited. Cannot under any circumstances be distributed outside the company. Inside the company recipient must have a specific need for the information in the conduct of his responsibilities.

PROPRIETARY CLASS 2

Distribution only within the company. Copies of such documents cannot be either given or shown to anyone outside the Corporation except (1) licensees (with Associated Companies' approval) and (2) the government in proposals for contracts.

PROPRIETARY CLASS 3

Unlimited distribution, both inside and outside the company.

TDS- ID 76-31
Issuing Dept., Plant or Div. Insulation Development Engrg.
Proprietary Class: 2 Pages: 5 References: Dates: 8-24-76
ASBESTOS IN LRA - PROGRESS REPORT by C. R. Ruffing
Keywords - Asbestos, OSHA, Reinforcement, Heat Resistant, Refractories, Ceramic, Insulation
Abstract - A program was developed to eliminate the use of asbestos products in LRA. Replacement materials have been obtained for most items and evaluation of these materials continue.

Brake shoe and gasket items require future effort because of the unavailability of replacement materials.

Card 1 of 1 Card(s)

TDS

Card 2 of 2 Cards

To:

Insulation
Development 12L

TDS ID 76-31

Send copy of ☐ Document
☐ TDS Card

To:

DECEMBER 1992

IN RE: ABRAMS
77-0040377

ID 76-31

ASBESTOS IN LPA
PROGRESS REPORT

Proprietary Class 2

Distribution

East Pittsburgh 11N-S	N. A. Beldecos
4N24	C. R. Marcum
	Route to: 5N-N D. H. Rielly
	5N-S J. D. Davidson
	3N46 J. W. Batchelor
	4N46 W. H. Morse
5N-N	R. M. Sexton
4N-S	P. J. Hillen
3N14	B. B. Winer
	Route to: 6N38 E. H. Myers
	4N-S A. J. Spisak
6N-N	L. W. Finnell
3N66	H. C. Elliott
3GA	A. S. DePaul
	Route to: 2G J. F. Onofrey
	2G R. L. Oblich
	2G S. A. Drinkut
	12L W. P. Iski
	5G F. R. Hoguet
10L	P. R. Heller
	Route to: 12L R. L. Novak
	12L J. G. Myers
	10L L. P. Curtis
	10L E. I. King
2N32	D. L. Donatucci
	Route to: MA Gen'l. D.G. LePere
	3GA O. J. Mitol
	2N49 R. C. Simmers
4G10	G. T. Brady
Irwin	W. R. Watson
6G28	R. F. Crouse
<u>R&D</u>	<u>401-3X9 Z. R. Heasley</u>
	501-3Y34 R. N. Sampson
	601-2B20 W. M. Day

Members of Asbestos Committee

03114809