

*John Westinghouse
Drelec*

Bergen

MONSANTO INDUSTRIAL CHEMICALS COMPANY

WELCOMES

MR. M. J. MC DONOUGH

WESTINGHOUSE ELECTRIC CORPORATION

St. Louis, Mo.

June 1, 1972

MONS 043104

INDEX

BACKGROUND DISCUSSION PAPERS

<u>SECTION</u>		<u>PAGE</u>
I	MICC SUMMARY POSITION ON DIELECTRIC AROCLORS	1
II	WESTINGHOUSE PURCHASES OF CAPACITOR AND TRANSFORMER INERTEENS 1968-1972 (Est.)	2
III	MONSANTO DIELECTRIC FLUIDS	
	- Pricing Capacitor Aroclor to Westinghouse 1953-1972	3
	- Pricing Transformer Inerteen to Westinghouse 1968-1972	4
	- Pricing Characteristics and Cost Increases	5
IV	MONSANTO PRESENTATION TO FEDERAL GOVERNMENT PCB TASK FORCE	6
V	SUMMARY GOVERNMENT PCB TASK FORCE REPORT AND RECOMMENDATION	21
VI	MONSANTO RESEARCH PROGRAM - PCB REPLACEMENT PRODUCTS.	
	COOPERATIVE PROGRAM WITH WESTINGHOUSE	

MONS 043106

MONSANTO INDUSTRIAL CHEMICALS COMPANY
SUMMARY POSITION ON DIELECTRIC AROCLORS

ac
~~In view of~~ the PCB ecological situation *developed:*
continue to supply

- OK 1) Monsanto decided to ~~remain in the~~ dielectric Aroclor ~~business~~ because of the electrical industry's need for these products based on their unique performance characteristics, and because industry supported Monsanto with special agreements of indemnification.

- OK 2) Monsanto ~~has~~ voluntarily phased out of many PCB markets and ~~will~~ sell only to approved *the electrical* *the non-electrical* *customers*. This decision was supported recently by the U.S. Government PCB Task Force.

- 3) Monsanto with industry cooperation developed a more environmentally acceptable capacitor fluid ~~fluid - based on dielectric fluid~~ *with 100% dielectric fluid*.

- 5 4) Monsanto's costs for dielectric Aroclors have increased because of:

- Lost sales volume/lower production divisor
- Pollution clean-up costs
- Research & development expenses on new products
- Toxicity, biodegradation test work
- Plant investments

- 5) Monsanto has had (since 1969) a research and development program to find "PCB" substitutes in the dielectric area:

- To date some promising leads
- A capacitor experimental sample
- Transformer Fluid - no candidates as yet
- At least 2-3 years away from commercialization

- 6) On balance, the ecological risks have been substantially reduced by Monsanto and customer actions.

- B) Monsanto has long valued our relationship with Westinghouse and we desire to work closely with you at all levels of Management.

I

MONS 043108

WESTINGHOUSE PURCHASES
OF
CAPACITOR AND TRANSFORMER INERTEENS

POUNDS

<u>LOCATIONS</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972 Est³</u>
Bloomington, Ind.	3,610,000	2,724,000	2,557,980	1,032,600	2,046,000
Total Capacitor Inerteen	3,839,000 ¹	2,724,000	2,566,380 ²	1,051,650 ²	2,100,000 ²
Notes: 1) Includes small sales to Vicksburg					
					2) Includes small sales to Cleveland
					3) Annualized, from first four months
Sharon, Pa.	5,873,000	2,596,000	2,244,520	1,213,000	270,000
So. Boston, Va.	--	2,051,000	3,469,120	4,083,000	3,927,000
Phoenix, Ariz.	--	237,000	323,900	225,000	270,000
Service Shops	<u>1,003,000</u>	<u>740,300</u>	<u>1,399,866</u>	<u>285,000</u>	<u>393,000</u>
Total Transformer	6,876,000	5,624,300	7,437,406	5,806,000	4,860,000
Total Westinghouse	10,715,000	8,348,300	10,003,786	6,857,650	6,960,000

II

MONS 043110

Historical Price of Capacitor Aroclor
Sold To Westinghouse

<u>Year</u>	<u>Price Per Pound</u> <u>(Bulk)</u>	<u>Product</u>
1953	14.0¢ Not Delivered	Aroclor 1242
1957	13.88¢ Delivered	Aroclor 1242
1960	14.98¢ Delivered	Aroclor 1242
1964	14.50¢ Delivered	Aroclor 1242
1966	14.95¢ Delivered	Aroclor 1242
1970	16.00¢ Delivered	Aroclor 1242
1971	18.00¢ Delivered	Aroclor 1016
1972	20.50¢ Not Delivered	Aroclor 1016

Historical Price of Transformer Inerteen
Sold To Westinghouse Electric Company

<u>Year</u>	<u>Price Per Pound</u> <u>(Bulk)</u>	<u>Product</u>
June 1968	13.45¢ Not delivered.	Inerteen 54201CM
Jan 1, 1971	16.50¢ Not delivered.	(100% Aroclor 1242)
April 1, 1972	19.50¢ Not delivered.	"

<u>Year</u>	<u>Price Per Pound</u> <u>(Bulk)</u>	<u>Product</u>
July 1, 1970	14.70¢ Not delivered	Inerteen 54201 KA
		(70% Aroclor 1254 +
		30% TCB)
Jan 1, 1971	16.70¢ Not delivered	"
April 1, 1972	21.00¢ Not delivered	"

Table III

MONSANTO DIELECTRIC FLUIDS

Pricing Characteristics

1. Unusual price stability until 1970 even though ---

Cost Increases

Labor Costs:	197% Increase	(1953-1972)
Raw Materials:	20% Increase	(1953-1972)
Indirect Fixed Costs:	41% Increase	(1953-1972)

(e.g. Capacitor Fluids increased by only 7%, 1953-1969)

2. Increase 1970 - 1973² due to:

- A. Successful Development of Aroclor 1016
- B. Loss of 45% PCB Sales to other markets -- Divisor loss.
- C. Costs of Environmental Control Programs ---

Incinerator Program

Plant Clean-up

[

27

[

MONS 043114

MONSANTO PRESENTATION TO FEDERAL GOVERNMENT PCB TASK FORCE

MAY 15, 1972

OBJECTIVES

- PROGRESS REPORT ON LABORATORY BIODEGRADATION OF PCB'S
- RESIDUE ACCUMULATION STUDIES IN FISH, BIRDS AND MAMMALS
- TO SHOW REDUCTION IN LESS BIODEGRADABLE PCB'S AS A RESULT OF MONSANTO ACTIONS ON SALES AND PRODUCTS

MONS
043115

①

MONSANTO PCB ACTIONS

- PHASE-OUT OF PCB SALES WORLDWIDE IN ALL APPLICATIONS EXCEPT DIELECTRICS
- CONVERSION OF DIELECTRIC FLUIDS TO MORE BIODEGRADABLE PCB'S

2

MONS 043116

MONSANTO PCB SALES IN U.S.A.

(MILLION POUNDS)

	<u>DIELECTRICS</u>	<u>ALL OTHERS</u>	<u>TOTAL</u>
1969	37.0	30.0	67.0
1970	40.5	33.5	74.0
1972 (EST.)	32.0	--	32.0

MONS 043117

③

EFFECT OF
PHASE-OUT POLICY

PCB SALES REDUCED IN U.S.A. BY

4
30 TO 33 MILLION POUNDS,

OR 45%

MONS 043118

PCB PRODUCT
CHANGES IN DIELECTRICS

CAPACITORS

97% CONVERSION TO AROCLOR 1016

TRANSFORMERS

ELIMINATION OF AROCLOR 1260

MONS 043119

6

DEGREE OF BIODEGRADATION OF PCB'S

BASED ON DATA PRESENTED

- TRANSITION IN BIODEGRADATION OCCURS
AROUND PENTA-/HEXA-CHLOROBIPHENYL
- DISAPPEARANCE OF ALL HOMOLOGS BELOW
HEXA-CHLOROBIPHENYL OBSERVED
- PENTA- AND HIGHER PCB DETERMINED BY
SPECIFIC GLC/MS TEST METHOD

PCB'S USED IN CAPACITORS

<u>PCB</u>	<u>MAJOR USE PERIOD</u>	<u>% PCB (PENTA- CHLORO- AND HIGHER</u>	<u>% PCB (HEXA- CHLORO- AND HIGHER</u>
AROCLOR 1254	1930-1952	77.0	29.0
AROCLOR 1242	1952-SEPT. 1971	9.0	1.0
AROCLOR 1016	OCT. 1971	1.1	0.1

CAPACITOR FLUIDS
WHY CONVERT
TO AROCLOR 1016 ?

- 9-FOLD REDUCTION IN PCB'S OF PENTACHLORO- AND HIGHER
- 10-FOLD REDUCTION IN PCB'S OF HEXACHLORO- AND HIGHER
- MINIMUM INDUSTRY TESTING REQUIRED

CAPACITOR FLUIDS

WHAT IS THE EFFECT OF AROCLOR 1016 ?

U.S. CAPACITOR FLUID SALES (1972): ~20 M LBS.

<u>IF AROCLOR WAS</u>	<u>% PENTACHLORO- AND HIGHER PCBs WOULD BE*</u>	<u>% HEXA CHLORO- AND HIGHER PCBs WOULD BE*</u>
1254	15,400,000 POUNDS	5,800,000 POUNDS
1242	1,800,000	200,000
1016	220,000	20,000

*THIS DOES NOT MEAN AMOUNTS OF PCB ENTERING THE ENVIRONMENT

WHAT IS CAPACITOR
FAILURE RATE ?

INDUSTRY SOURCES CITE : 0.02-0.2% PER YEAR

IF CAPACITOR FAILURE RATE
IS 0.2% PER YEAR (WORST CASE)

PCB ESCAPE TO THE ENVIRONMENT* IS --

	<u>AROCLOR 1242</u>	<u>AROCLOR 1016</u>
ALL PCB HOMOLOGS	40,000 POUNDS	40,000 POUNDS
PENTA CHLORO- AND HIGHER	3,600	440
HEXA CHLORO- AND HIGHER	400	40

*ASSUMES U.S. FLUID SALES OF 20 M LB./YEAR

PCB CHANGES IN
TRANSFORMER FLUID APPLICATIONS

- AROCLOR 1260 BEING PHASED-OUT NOW
- INCINERATION OF SCRAP PCB'S - 1971

NOTE: ASKAREL (PCB) TRANSFORMERS ARE
TIGHTLY SEALED UNITS

WHAT IS FAILURE RATE
IN LIQUID TRANSFORMERS ?

INDUSTRY SOURCES CITE: UNDER 0.2% PER YEAR*

*ALL LIQUID TYPES - MINERAL OIL AND PCB.

IF ASKAREL (PCB)
TRANSFORMERS FAIL AT 0.2%/YEAR
HOW MUCH PCB IS AFFECTED*?

ALL PCB HOMOLOGS

24,000 LBS.

(ESTIMATED PCB TRANSFORMER FLUID SALES IN U.S. 12 M LBS./YEAR)

*WITH INCINERATION FACILITIES AVAILABLE, NOT ALL THESE AMOUNTS
WILL ENTER ENVIRONMENT.

MONSANTO'S PRESENT PROGRAM TO PREVENT ENVIRONMENTAL POLLUTION BY PCB'S

- NO MORE SALES WORLD-WIDE EXCEPT APPROVED
DIELECTRIC USERS
- RESTRICT OVER 97% CAPACITOR FLUID SALES TO
AROCOR 1016 ONLY
- ELIMINATE AROCOR 1260 FROM TRANSFORMER
FLUIDS
- CONTINUE INCINERATION FACILITIES FOR SCRAP PCB'S
- ENCOURAGE DIELECTRIC INDUSTRY THROUGH ANSI
C-107 TO ENFORCE STRICT ENVIRONMENTAL CONTROL
OVER PCB'S

MONS 043130

Districts I - IV--Licensed refinery crude and unfinished oils, 1,379,181 b/d; licensed petrochemical crude and unfinished oils, 175,088 b/d; licensed finished petroleum products, 312,011 b/d; licensed residual fuel oil, 1,955,948 b/d; exempt imports from Canada, 7,934 b/d of finished petroleum products; and exempt imports from Mexico, 33, 253 b/d of unfinished oils.

District V--Licensed refinery crude and unfinished oils, 418,207 b/d; licensed petrochemical crude and unfinished oils, 20,242 b/d; licensed finished petroleum products, 23, 662 b/d; licensed residual fuel oil, 1,556 b/d; and exempt imports from Canada, 222,774 b/d of crude oil, unfinished oils and finished petroleum products.

Porto Rico--Licensed crude and unfinished oils, 330,059 b/d; licensed finished petroleum products, 3,962 b/d; and licensed residual fuel oil, 4,768 b/d.

Shipments from Puerto Rico during December were: To Districts I - IV--Unfinished oils, 16,261 b/d; finished petroleum products, 107,551 b/d; and residual fuel oil, 0 b/d.

District V consists of Alaska, Arizona, California, Hawaii, Nevada, Oregon and Washington. Districts I - IV are comprised of the remaining states.

- 0 -

STANDARDS: USDA LOWERS GRADE REQUIREMENTS FOR FLORIDA, IMPORTED SEEDLESS GRAPEFRUIT

The Department of Agriculture has revised grade requirements for Florida and imported seedless grapefruit.

The minimum grade for fresh shipments of seedless grapefruit grown in the Interior District of Florida and marketed under a federal marketing agreement and order has been lowered to U.S. No. 1 Russet, effective May 12, 1974. For seedless grapefruit from the Indian River District, the minimum grade will be lowered to U.S. No. 2 Russet on May 14. The previous minimum grade requirements were U.S. No. 1 and Improved No. 2, respectively.

Grade requirements for all imports of seedless grapefruit will be lowered to U.S. No. 2 Russet on May 19, so as to be comparable to the requirements for the Florida-produced grapefruit. The current grade requirement for all such seedless grapefruit is Improved No. 2. The Agricultural Marketing Agreement Act requires that imports of certain commodities, including grapefruit, must meet the same or comparable requirements as those imposed on domestic commodities regulated under a Federal marketing order.

No change is being made in the minimum size requirements for Florida-produced seedless grapefruit or imported seedless grapefruit. Presently, both Florida and imported seedless grapefruit must be at least 3-7/16 inches in diameter.

- 0 -

CHEMICALS: TASK FORCE FINDS PCB'S NO HAZARD TO HEALTH, BUT RECOMMENDS USE RESTRICTIONS

A Federal Government Task Force on the chemicals known as PCBs--polychlorinated biphenyls--over the week-end issued a report recommending that all current uses of the chemicals, except in electrical capacitors and transformers, be discontinued.

At the same time, the Task Force concluded that current environmental levels don't constitute an imminent hazard to health, but the effects of long-term exposure are largely unknown.

In conjunction with the issuance of the report, the Government announced several actions to deal with the PCB problem:

1. The Environmental Protection Agency will restrict the discharge of all industrial effluents of PCB's from PCB users into water so that levels of PCB's in rivers or lakes do not exceed 0.05 parts per billion.

2. The Food and Drug Administration proposed on March 18 new regulations which include new and more stringent action levels for PCB's in food, steps to prevent PCB's in food packaging, and measures to prevent contamination of food from accidents in food plants.

The Task Force report, entitled "PCB's and the Environment," is the result of a six-month review by eight federal agencies. It includes detailed information on the production, use, and distribution of PCB's, the benefits of the chemicals, the effects of PCB's on man and wildlife, and a variety of other data related to the problem.

Despite finding "much data that it regards as inadequate and many questions that remain unanswered," the Task Force concluded, from all of the available scientific information on the PCB problem that:

1. All uses of PCB's that are not essential should be discontinued, and to the extent that they must be used great care should be taken to prevent release of the substances to the environment.

2. The chemicals can have serious adverse effects on human health, but, so far as now known, these adverse effects will not occur as a result of the levels of PCB's currently in the environment.

3. PCB's are highly persistent and can be found in almost all parts of the environment.

4. High levels of PCB's have occurred in food as a result of accidental release of the substance. Steps taken by FDA and the Department of Agriculture will minimize the occurrence of such accidents in the future and avoid the food and economic losses that have accompanied the accidents.

5. The use of PCB's should not be banned entirely. If currently available substitutes were used in transformers and capacitors there would be a greatly increased likelihood of fire and explosion, resulting in deaths, injury, and damage to property. Furthermore, such use can be controlled so that it does not insignificantly contribute to environmental contamination.

6. The major gap in the regulatory system to deal with PCB's is the absence of any broad federal authority to restrict use or distribution, to control imports, and to collect information. The task force believes that such authority is needed. It would be provided by the Administration's Toxic Substances Control Act, now pending before congress. The Monsanto Company, the sole U.S. producer of PCB's, has reported voluntarily taking a number of actions, including discontinuing sales of PCB's for use in paints, plasticizers, sealants, adhesives, and all other open-system uses.

7. PCB's are widely manufactured in Japan, Italy, France, West Germany, and Russia, and possibly in Brazil, Argentina, India, and East Germany. Many electrical products imported from those or other countries into the United States may use PCB's. The Task Force knows of no way to monitor this supply unless the Toxic Substances Control Act or similar legislation is enacted. Until then, buyers of products which may contain PCB's are cautioned that they should question their overseas suppliers about the potential presence of PCB's and consider the substitution of suitable alternatives.

As an additional measure, the United States has asked the Organization for Economic Cooperation and Development (OECD) through its environment committee to make a special review of member states' national policies concerning PCB's and also to identify products moving in international trade which contain PCB's. OECD, whose membership includes all major western industrialized states plus Japan and Australia, has been giving priority attention to the problem of PCB's over the past year.

The 192-page report "PCB's and the Environment" is available at \$6 from the National Technical Information Service, Springfield, Virginia 22151, or the first floor of the commerce building, Washington, D.C.

* Prime Print.

MONS 043132

Monsanto

MONSANTO INDUSTRIAL CHEMICALS CO.
800 N. Lindbergh Boulevard
St. Louis, Missouri 63188
Phone: (314) 584-1000

May 19, 1972

Westinghouse Electric Corp.
P. O. Box 341
Bloomington, Indiana

Gentlemen:

Monsanto Company, through its operating unit Monsanto Industrial Chemicals Company (hereinafter "MONSANTO"), possesses certain proprietary and confidential information relating to dielectric fluids useful in electrical apparatus, particularly in electrical capacitors. MONSANTO understands that Westinghouse Electric Corp. (hereinafter "WESTINGHOUSE") is desirous of evaluating the performance of certain of said dielectric fluids and MONSANTO is willing to make samples thereof available to WESTINGHOUSE under certain terms and conditions.

To enable WESTINGHOUSE to evaluate performance of the samples it may be necessary for MONSANTO to disclose to WESTINGHOUSE certain confidential information concerning the nature of the dielectric fluids, their performance, test methods and the like. Furthermore, the furnishing of fluid samples to WESTINGHOUSE will provide WESTINGHOUSE with certain knowledge of the fluid characteristics. All such disclosure and knowledge received by WESTINGHOUSE is hereinafter referred to as "Dielectric Fluid Information."

It is understood and agreed that WESTINGHOUSE will not, for a period of five (5) years following the date first set forth above, use (except in connection with evaluation of test samples of dielectric fluids) or disclose to others, unless specifically authorized by MONSANTO in writing, Dielectric Fluid Information obtained under this Agreement; provided, however, that WESTINGHOUSE shall not be subject to the restrictive obligations set forth herein with respect to Dielectric Fluid Information which

- (1) is known to WESTINGHOUSE at the time of its receipt from MONSANTO which can be established by documentary evidence,

MONS 043133

May 19, 1972

- (2) is or through no fault or act of WESTINGHOUSE becomes part of the public knowledge or literature, or
- (3) lawfully becomes available to WESTINGHOUSE from a source other than MONSANTO without restriction on disclosure or use.

Specific portions of Dielectric Fluid Information shall not be deemed to be in the prior possession of WESTINGHOUSE or in the public knowledge or literature merely because it is embraced by more general information in the prior possession of WESTINGHOUSE or in the public knowledge or literature.

It is understood and agreed that WESTINGHOUSE will not analyze (or have analyzed) fluid samples furnished by MONSANTO. WESTINGHOUSE agrees to return all unused portions of the samples to MONSANTO upon completion of the evaluations. WESTINGHOUSE shall not transfer the samples to third parties within the term of this Agreement.

If the foregoing terms and conditions meet with the understanding and approval of WESTINGHOUSE, please show the acceptance and agreement of WESTINGHOUSE by having an authorized representative of WESTINGHOUSE execute this letter in duplicate at the place indicated below.

Very truly yours,

MONSANTO COMPANY

By *Henry P. Buge*
Director, Specialty Products

INHD

ACCEPTED AND AGREED TO:

WESTINGHOUSE ELECTRIC CORP.

By _____
Title:

Date _____

WHD:map