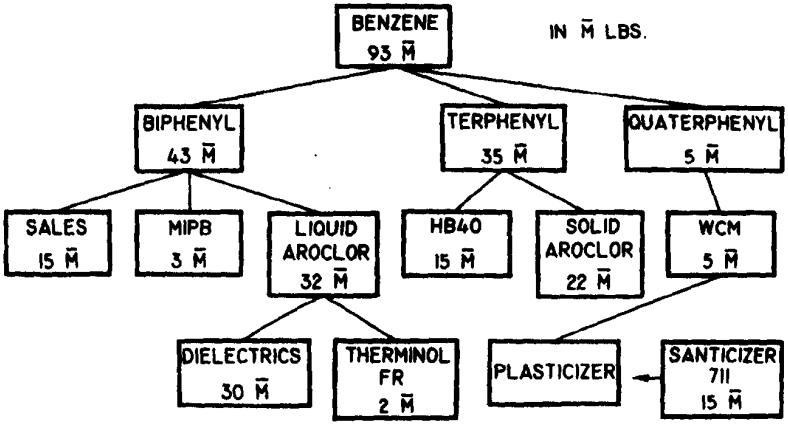
D. Hansen

STATUS REPORT

POLYCHLORINATED BIPHENYLS

November 12, 1971

MONS 045449


BENZENE
93 M
IN M LBS.
BIPHENYL
43 M
TERPHENYL
35 M
QUATERPHENYL
5 M
SALES
15 M
MIPB
3 M
LIQUID
AROCLOR
32 M
HB40
15 M
SOLID
AROCLOR
22 M
WCM
5 M
DIELECTRICS
30 M
THERMINOL
FR
2 M
PLASTICIZER
SANTICIZER
711
15 M

ACTION PLAN
APPROVED BY CMC

1) TERMINATE SALES OF ALL NON-BIODEGRADABLE CHLORINATED BIPHENYLS TO NON-CONTROLLABLE END USES
Complete: August 30th, 1970

2) DISCONTINUE SALES OF AROCLOR 1242 TO NCR AND REPLACE WITH HB-40 IN U.K., AND MIBP IN U.S.A.
Complete U.K.: July 1st, 1970
Complete U.S.A.: 1st Quarter 1971

3) CLOSE THE LOOP ON HEAT TRANSFER APPLICATIONS WHERE F/R IS VITAL AND REPLACE WITH ALTERNATES IN OTHER CASES
Complete: December 30th, 1970

4) REPLACE ALL NON-BIODEGRADABLE CHLORINATED BIPHENYLS IN HYDRAULIC APPLICATIONS
Complete 20%: August 1st, 1970
Complete 40%: November 1st, 1970
Complete 100%: March 31st, 1971

5) CLOSE THE LOOP ON ALL NON-BIODEGRADABLE CHLORINATED BIPHENYLS IN TRANSFORMER APPLICATIONS
Complete: August 1st, 1970

6) CLOSE THE LOOP ON CAPACITORS AS FAR AS POSSIBLE AND REPLACE 1242 WITH AROCLOR 1016
Complete: December 31st, 1970

7) PLANT DISCHARGES WILL BE REDUCED TO A LEVEL OF 10 PPB (1 LB. PER DAY)
Target: September 30th, 1971

1) TERMINATE SALES OF ALL NON-BIODEGRADABLE CHLORINATED BIPHENYLS TO NON-CONTROLLABLE END USES

COMPLETE - AUGUST 30th, 1970

- Sales of PCB's to plasticizer applications were terminated August 30th, 1970.
- 40% of this business was retained by substitute products containing HB-40 and chlorinated terphenyls -- it is probable that chlorinated terphenyls will come under environmental pressure in the future.

SALES
(Millions of Pounds)

YEAR	PCB	REPL. PRODUCT	$	GROSS PROFIT
1969	13.2	-	2.4	1.1
1970	15.9	.7	3.0	1.3
1971	2.4	4.1	1.3	.5
1972	-	4.7	1.0	.4

2) DISCONTINUE SALE OF AROCLOR 1242 TO NCR

AND REPLACE WITH HB-40 IN

U.K., AND MIBP IN U.S.A.

COMPLETE - U.K. -- JULY 1st, 1970
COMPLETE - U.S. -- 1st Qtr 1971

- NCR domestic were changed to MIBP March 31st 1971.
- NCR U.K. and Germany using HB-40 since July 1st 1970.
- 1972 - NCR domestic will change to either alkylated naphthalenes or other alkylated biphenyls.

  1973 - NCR U.K. and Germany will probably move to same products.

SALES
(Millions of Pounds)

YEAR	PCB	REPL. PRODUCT	$	GROSS PROFIT
1969	10.9	-	1.8	.9
1970	9.4	1.9	1.7	.9
1971	2.5	11.4	3.3	1.4
1972	-	14.1	3.2	1.2

3) CLOSE THE LOOP ON HEAT TRANSFER APPLICATIONS WHERE F/R IS VITAL AND REPLACE WITH ALTERNATES IN OTHER CASES

COMPLETE - DECEMBER 30th 1970

- 53% of heat transfer fluid sales are now non-PCB products.
- Following East Coast Terminal incident we have investigated over 650 installations and changed all food or feed related uses to non-chlorinated fluids -- paper mill applications are also being changed.
- Objective is to phase out of all heat transfer uses of PCB's -- cost is a major factor in persuading customers to refill and return spent PCB for incineration.

SALES
(Millions of Pounds)

YEAR	PCB	REPL. PRODUCT	$	GROSS PROFIT
1969	3.7	-	1.0	.7
1970	5.5	-	1.5	1.0
1971	4.2	-	1.3	.8
1972	3.2	.8	1.2	.7

(1)

HYDRAULIC FLUIDS. —

PROGRAMME COMPLETED

BUT USING PHOSPHATE ESTERS & CHLORINATED TERPHENYLS. — REPLACEMENT MUST BE TOTAL PHOSPHATES. (?) — PROJECT FOR NC. PHOSPHATE —

PROBLEM OF PCBs IN TERPHENYLS — NOW DOWN TO 0·2 - 0·3 %. — PROJECT IN HAND WILL TAKE US DOWN TO

4) REPLACE ALL NON-BIODEGRADABLE

CHLORINATED BIPHENYLS IN

HYDRAULIC APPLICATIONS

COMPLETE 20% - AUGUST 1st, 1970
COMPLETE 40% - NOVEMBER 1st, 1970
COMPLETE 100% - MARCH 31st, 1971

- Replacement completed March 31st 1971.
- Blends of chlorinated terphenyls and phosphate esters used as replacements -- pressure on chlorinated terphenyls would result in need for move to total phosphate ester systems -- project for NC phosphate ester will be submitted early December -- estimated new capital $400M.

SALES
(Millions of Pounds)

YEAR	PCB	REPL. PRODUCT	$	GROSS PROFIT
1969	20.3	-	5.3	2.4
1970	22.9	-	5.8	2.3
1971	3.6	19.8	6.0	2.1
1972	.5	20.5	5.5	1.7

5) CLOSE THE LOOP ON ALL NON-BIODEGRADABLE CHLORINATED BIPHENYLS IN TRANSFORMER APPLICATIONS

COMPLETE - AUGUST 1st, 1970

- Achieved good degree of success -- major customers now cooperating -- constant vigilance needed.
- ANSI established committee to provide guidance -- W. B. Papageorge chairman.
- Solids disposal remains problem -- G.E. working on incineration techniques.

SALES
(Millions of Pounds)

YEAR	PCB	REPL. PRODUCT	$	GROSS PROFIT
1969	20.3	-	3.2	1.2
1970	22.9	-	3.7	1.4
1971	23.4	-	4.3	1.5
1972	22.5	-	4.2	1.3

(6. CAPACITORS.

MAJOR PROBLEM – DISPOSAL OF END PRODUCT. ~ 90% OF SMALL CAPACITORS HAVE 2-YEAR LIFE.

ALTERNATES — SULPHONES ETC ETC – TESTING ARRANGEMENT WITH GE NEED BETTER RELATIONS WITH WESTINGHOUSE

6) CLOSE THE LOOP ON CAPACITORS AS FAR AS POSSIBLE AND REPLACE 1242 WITH AROCLOR 1016

COMPLETE - DECEMBER 31st, 1970

- Good progress with major customer cooperation -- but disposal of spent ballast and small capacitors remains problem.
- Aroclor 1016 (lower isomers -- less persistent) now in use by all domestic customers.
- Continuing work on housekeeping needed -- ANSI committee developing standards.
- Industry could go to alternates within 2 years for small capacitors (55% of total) but replacement for existing equipment a serious problem.

SALES
(Millions of Pounds)

YEAR	PCB	REPL. PRODUCT	$	GROSS PROFIT
1969	33.6	-	4.9	2.3
1970	39.9	-	5.9	2.7
1971	27.1	-	4.4	1.6
1972	29.9	-	5.2	1.9

(7)

PLANT LEVELS.

MEETING WITH JOHN WHITE EPA - SE REGION OFFICE.

DISCUSSED DETAILS ACTIONS - ON INTERIM - NO PCB MANUFACTURE NOW AT ANNISTON - DISCUSSED KRUMMRICH - NOTED FOR MEETING WITH ILLINOIS EPA ETC.

7) PLANT DISCHARGES WILL BE REDUCED

TO A LEVEL OF 10 PPB (1 LB. PER DAY)

TARGET - SEPTEMBER 30th, 1971

- Continuing progress -- average level of losses during past 3 months:

  W. G. Krummrich - 0.2 lbs./day *

  Newport - 1.0 lbs./day

  Anniston - 0.3 lbs./day

  * Aroclor Department

- Major problems:

  Krummrich - Sewer deposits - Sauget Village treatment plant levels

  Anniston - Chocolocca Creek and Lake Martin - EPA & Alabama State Water Quality Board

(5) TRANSFORMERS

MEETING WITH GE - VICE PRESIDENTS —

INVOLVEMENT — NEED FOR MONSANTO COMMITMENT —

—

WORK TOGETHER — SUPPORT INFORMATION

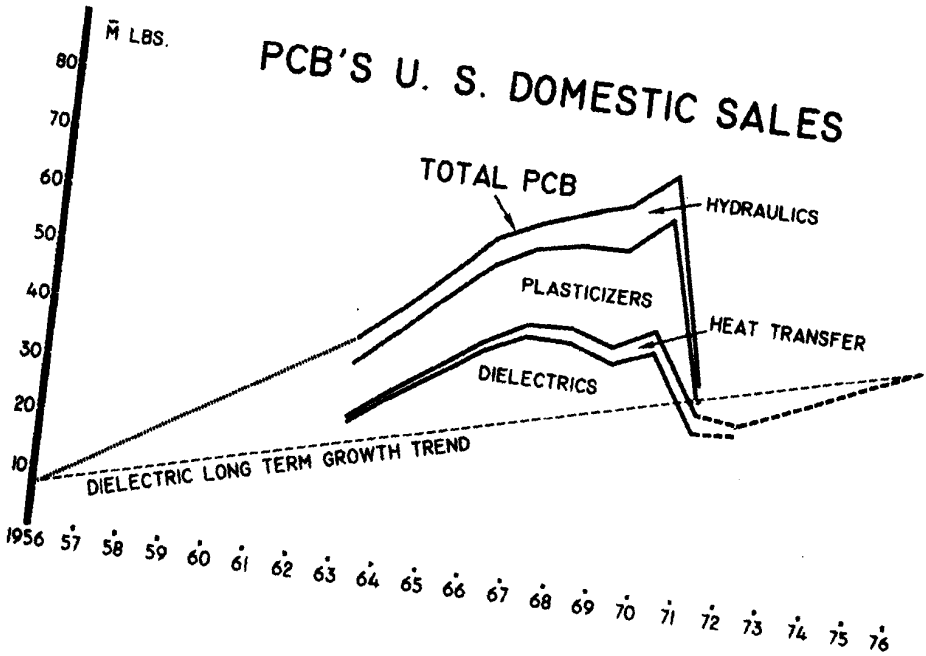
ON TRANSFORMER USES.

—

PROBLEM AGGRAVATED BY OUR PUBLIC DISCLOSURE.

30 YEARS — 95% STILL IN USE.

MONS 045462


M LBS.
80
70
60
50
40
30
20
10
PCB'S U. S. DOMESTIC SALES
TOTAL PCB
HYDRAULICS
PLASTICIZERS
HEAT TRANSFER
DIELECTRICS
DIELECTRIC LONG TERM GROWTH TREND
1956 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76

MONS 045463

WORLD WIDE

PROFITABILITY FORECAST

AROCLORS + NEW PRODUCTS

($M)

	1969	1970	1971	1972
SALES				
Dielectrics	8.1	9.6	8.7	9.4
Heat Transfer	1.0	1.5	1.3	1.2
Industrial Fluids	5.3	5.8	6.0	5.5
NCR	1.8	1.7	3.3	3.2
Plasticizers	2.4	3.0	1.3	1.0
TOTAL	18.6	21.6	20.6	20.3
GROSS PROFIT	8.6	9.6	7.9	7.2
NIAT	2.7	2.9	2.1	1.7
GROSS INVESTMENT	23.9	28.7	29.8	28.1
ROI %	11.3	10.1	7.0	6.0

BIODEGRADATION STUDIES

THE PCB'S ARE EXTREMELY PERSISTENT MATERIALS--THE LOWER HOMOLOGS WILL DEGRADE BUT SOME 10 TIMES SLOWER THAN SOFT ALKYL BENZENE SULFONATES.

BIODEGRADATION STUDIES ARE IN PROGRESS IN ST. LOUIS; RUABON AND AT THE UNIVERSITY OF NORTH WALES UNDER THE DIRECTION OF PROFESSOR EVANS.

RAT AND DOG FEEDING STUDIES WITH AROCLOR 1242 SHOW BREAKDOWN OF ALL LOWER ISOMERS--WE WOULD EXPECT COMPLETE BREAKDOWN OF AROCLOR 1016 AS HIGHER ISOMERS HAVE BEEN STRIPPED OUT OF THIS PRODUCT.

RUABON STUDIES INDICATE AROCLOR 1016 DEGRADES COMPLETELY IN PRESENCE OF C_2 C_3 CULTURES WHICH ARE FOUND IN THE ENVIRONMENT.

TOXICITY STUDIES

2 YEAR FEEDING STUDIES -- NOW COMPLETED.

FDA PRESS RELEASE -- DR. AL KOLBYE -- STATEMENT THAT PCB'S ARE MILDLY TOXIC.

TERATOLOGY -- RESULTS NEGATIVE.

HB-40 AND MIPB -- LOW LEVEL OF TOXICITY.

CHLORINATED TERPHENYLS -- INSUFFICIENT INFORMATION.

FEDERAL AND STATE AGENCIES

ESTABLISHED EXCELLENT RAPPORT WITH OFFICE OF SCIENCE AND TECHNOLOGY AND JOINT AGENCY TASK FORCE -- DISCLOSING FIGURES AND FULL DETAILS OF PCB USAGES.

MICHIGAN WATER QUALITY BOARD IMPOSING SEVERE RESTRICTIONS ON PCB LEVELS IN AUTOMOBILE PLANT EFFLUENT.

SPECIAL PROBLEMS

PROPOSED LEGISLATION

RYAN BILL -- PROPOSES TOTAL BAN -- NOT EXPECTED TO PASS.

PCB USED AS EXAMPLE IN JUSTIFYING TOXIC SUBSTANCES ACT.

LAW SUITS

HOLLY FARMS -- SUING MONSANTO AND OTHERS FOR $ 56M -- EAST COAST TERMINALS INCIDENT.

MILK CONTAMINATION -- 3 LAW SUITS FILED: -- COULD BE MORE -- DAMAGE WAS DONE SOME YEARS AGO.

MINNESOTA TURKEY INCIDENT -- POSSIBLE LAW SUIT -- NO EVIDENCE.

ENVIRONMENTAL DEFENSE FUND -- DEMAND FOR RELEASE OF PRODUCTION FIGURES -- POSSIBLE LAW SUIT OR INJUNCTION?

EX-U.S.A.

U. K. -- OUT OF OPEN SYSTEMS -- GOOD RAPPORT WITH GOVERNMENT.

SWEDEN -- LEGISLATION JANUARY 1, 1972 -- LICENSING FOR DIELECTRIC USAGE.

GERMANY -- DER SPEIGEL EMOTION -- BAYER NOW GETTING OUT OF HIGHER CHLORINATED ISOMERS FOR OPEN SYSTEMS.

JAPAN -- PRESSURE INCREASING -- MMK VISITED ST. LOUIS FOR DETAILED BRIEFING AND UPDATE ON U.S. SITUATION.

IMPLEMENTING TOTAL PLAN IN OTHER EX-U.S.A. MARKETS.

SUMMARY.

(1) HAVE FOLLOWED PLAN - BUT BAD DECISION IN HEAT TRANSFER AREA. — LAW SUIT.

(2) OBJECTIVE NOW IS TO PRESERVE DIELECTRIC BUSINESS — GET OUT OF HEAT TRANSFER AT LOWEST COST & RISK TO MONSANTO.

(3) DEVELOP & IMPLEMENT DEFINITE PLAN ON CHLORINATED TERPHENYLS.

MONS 045470

(4) HANDLE PUBLIC DISCLOSURE OF PRODUCTION & SALES STATISTICS.