M.I.C.C.

SPECIALTY AND PROCESS CHEMICALS DIVISION

PCB CONTINGENCY PLAN

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JNH:ad

COMPANY CONFIDENTIAL

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1. Strategic Summary

In the event that PCB's are banned by the U.S. Government and that sales in Europe have to be stopped within three months, we plan to retain a profitable polyphenyls and derivatives business. We will supply the probable unbalance in the diphenyl capacity / demand situation caused by our ceasing of PCB sales but we will not supply diphenyl for chlorination purposes. Our marketing of diphenyl and derivatives will be aggressive to make expansions by other manufacturers unattractive thus limiting their own terphenyl based business (Santosol 340 and Santotherm 66). The feasability of taking a share of the diphenyl/diphenyl oxide heat transfer fluid market will be studied when the economics of U.S. manufacture of diphenyl oxide are known. We plan to develop a capacitor impregnants business based on a hydrocarbon derived from diphenyl (eg. alkyl diphenyls). The possibility of a business in safety transformer fluids will be explored.

2. Market Situation

The impact of the U.S. Government ban and Monsanto's subsequent action in ceasing sales is examined for each of the different forces acting on the market for PCB's.

2.1. Effect on governments and supranational organisations concerned with the Environment :

OECD : U.S.A. would convene a meeting of the Committee for the Unintended Occurrence of Chemicals in the Environment and apply pressure to endorse their action and to make it applicable to all OECD countries within the shortest period possible. The Committee would examine all the scientific evidence and the effect of the ban economic ecological viewpoints together with its effect on trade. They would want input from Monsanto and other suppliers of PCB's as well as from the Electrical Industry. A first preliminary report would probably take three months to be published and no action would result apart from a request to member states to study the situation in each of their countries and report back within six months. Final recommendations would take a further nine months to a year to be published depending on gravity of findings (eg. incidence of health problems in capacitor plants).

Total time from Monsanto / U.S. Government announcement to final OECD recommendations say 18 months.

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E.E.C. : No immediate acceptance of ban, would probably act in accord with OECD recommendations.

U.K. Government : Independently of OECD the U.K. Dept. of the Environment and Dept. of Trade and Industry will want scientific data on reasons for the U.S. Government action. They will consult with industry and no doubt follow OECD timing. They would permit import of competitive PCB's until industry was able to change over to non-PCB products according to OECD timing. Estimated timing required for implementation of a PCB ban two years min. from date of U.S. announcement particularly since U.K. industry has not evaluated PCB replacements.

Scandinavia + Switzerland : Will put a lot of pressure on their industry to convert even ahead of the OECD recommendations but no instant action will be possible. Likely timing as for U.K. (but the two years would probably be a maximum).

France, Germany, Italy, Belgium : Will wait for OECD / EEC recommendations.

E. Europe : Will decide their own policy based on economic and bureaucratic criteria, but likely to continue using PCB's for another five years.

2.2. Effect on Customers :

Capacitors : Significant customers making up over 90 % of our sales volume are :

W. Europe :		Tonnes
*BICC	- U.K.	500
**CGE	- Italy	200
*Nokia	- Finland	200
*Lilljeholmen	- Sweden	100
RIC	- U.K.	100
		1100

E. Europe :		
Sojuschim	- U.S.S.R.	1200
Petrolexport	- Romania	400
		1600

* licensees of General Electric U.S.A
** affiliate of " " "

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Transformers : Our business can be conveniently divided into two major parts, the U.K. market and ACEC Belgium as follows :

U.K. market	500
*ACEC Belgium	400
Total	900

* affiliate of Westinghouse U.S.A.

U.K. market with its low distribution voltage of 11 kv (as opposed to 22 kv in continental Europe) has always had the option of dry-type transformers. Our ceasing of sales would simply cause the dry-type to take over the market share held by askarel transformers.

ACEC Belgium as an affiliate of Westinghouse U.S.A. would have U.S. technology available and switch as soon as Westinghouse / government / customer pressures dictated.

2.3. Effect on other Monsanto business :

If our notice period is too short for customers obtain other supplies,we could prejudice other Monsanto relationships.

2.4. Press and Media : (U.K. only)

Press and Media will no doubt bring PCB's into the head lines again and bring out all their previous press matter along the lines of "we told you so - these are the most dangerous chemicals known to man".

2.5. Legal Implications and Resurrection of Past PCB Problems :

These would probably be limited to the U.K. and a review by legal department of past problems is required to determine our increased exposure (if any).

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2.6. IEC, CIGRE, Local Electrical Associations :

Capacitors : Monsanto would need to get standards for impregnants used in large p.f. correction capacitors added to in order to cover our non-PCB fluids. No other significant problems are foreseen in the standards area.

Transformers : If alternative non-PCB askarels are available or silicate fluids are developed Monsanto will need to initiate new specifications.

2.7. Effect on Installed Electrical Equipment :

Capacitors : Short term say 2 year forward needs would be supplied by PCB capacitors made by our customers using PCB's from competition until non-PCB products were available and/or mandatory.

Transformers : Any U.K. market needs for top-up would be supplied by competition. If PCB's were finally banned it is likely that a mixture of selected chlorobenzenes could probably be used at least for a time unless other non-PCB askarels were available.

2.8. Effect on Remaining PCB Suppliers :

European suppliers are :

Estimated tonnage manufactured (1973 OECD Statistics)

	Tonnes	% of Total
Bayer	7382	29
Monsanto	4067	16
Prodelec	9674	37
*Caffaro	2519	10
***Coquisa / Flix**	2000	8
Total	25642	

at today price of approx. $ 850 / tonne net to plant give a market value of $ 22 M

*20 % owned by Ugine Kuhlmann,
**licensee for Prodelec technology.

***Wholly owned by Rhône Poulenc, acts as sales agent for Flix.

Prodelec is a 50/50 venture between Rhône Poulenc and Ugine Kuhlmann.

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Bayer :

Bayer will do everything possible to stay in the business but will abide by OECD timing. Their action following Monsanto's withdrawal of PCB fluids from the German mines (where Bayer simply stepped in and took the business), admittedly with OECD and German government approval, shows that they are unlikely to follow Monsanto's lead unless there is OECD or Government pressure. Their continue sales of poly-chlorinated terphenyls to this day is a further indication of their attitude.

Prodelec :

90 % of this company's turnover is in askarels. They will do everything possible to stall and delay a ban on PCB sales. The parent companies will however be the decision-makers and will without doubt follow the OECD timing.

Caffaro :

Is 20 % owned by Ugine Kuhlmann and will most likely follow their policy.

Coquisa / Flix :

Will follow Prodelec.

2.9. European Capacity / Demand Situation for PCB's :

Current PCB's capacity estimated as follows : (tonnes)

Company	Capacity	Demand
Bayer	10,000*	
Prodelec	14,000	
Caffaro	3,500	
Coquisa / Flix	3,500	
Total	31,000	26,000

* Bayer's capacity is a part-time activity in a multi-product chlorination unit, so capacity available depends on occupancy by other products. This is therefore a pure guess.

This date suggests that other suppliers would have no capacity problems supplying Monsanto's customers for PCB's.

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2.10. European Capacity/Demand Situation for Polyphenyls :

Shortages of diphenyl in 1974 suggest that Rhône Progil / Kuhlmann / Caffaro were running close to capacity before the 1975 recession set in. Bayer appeared to have 500 - 1000 tonnes of spare capacity.

Monsanto had no capacity problems (only benzene problems). If Monsanto ceases sales of PCB's then competition will take up PCB sales of 3000 tonnes Aroclor diphenyl and 1000 tonnes Pyroclors and need about 2200 tonnes of extra diphenyl. This could well leave the European market captive and non-captive with a total shortage of say 1000 tonnes.

We could gain sales in two ways. The preferred way would be to supply diphenyl direct to the market either as diphenyl or as the diphenyl content of the diphenyl / diphenyl oxide heat transfer fluid using diphenyl oxide ex Monsanto U.S.A. If this was not feasible but we could supply competitors shortfall provided they undertook not to use the product for chlorination purposes but restricted their use of our diphenyl to dye carrier and/or heat transfer fluid applications.

3. Critical Assumptions

- U.S. Government's ban calls for ceasing of sales within three months and is based only on sound scientific arguments which will convince OECD countries to follow suit, albeit according to their own timing.
- Monsanto Europe timing for ceasing of sales will be the same as Monsanto U.S.A., i.e. in line with U.S. Government ban.
- U.S. Government puts a ban import of raw PCB's and finished goods containing PCB's to coincide with Monsanto's last sales.
- Our competitors will only cease sales under pressure from OECD / local governements / EEC.
- Our ceasing of sales in time with the U.S. Government ban will be accepted as force majeure by our European customers.
- Should it be required, we will be allowed to supply diphenyl to competition provided they undertake not to use it for chlorination.

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4. Objectives (in order of priority)

- Maintain a viable polyphenyls and derivatives business at Newport, U.K. after ceasing sales of PCB's.

- Develop a profitable business in non-PCB capacitor impregnants based on a polyphenyl derivative.

- Develop a profitable business in non-PCB safety dielectric transformer fluids.

5. Key Action Steps

- Cease sales of all PCB's in line with corporate instructions.

- Provide data to all interested parties to back up the ceasing of PCB sales.

- Set up necessary financial reserves to cover ceasing of PCB sales e.g. write offs of plant, stocks, costs of disposing of PCB's, analytical costs, P.R. costs, legal costs, etc.

- Legal Department reviews past PCB problems and determine our increased exposure (if any).

- Retain all existing Santosol 340, Santotherm 66 and diphenyl business.

- Supply any shortfall in the European capacity/supply situation.

- Develop a market for non-PCB capacitor impregnants based on alkyl diphenyls or other diphenyl derivatives.

- Determine market for non-PCB safety dielectric transformer coolants.

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6. Financial Data

Assuming earliest date for ceasing all PCB sales is October 1, 1975, our last quarters income statement (using the sales figures and COGS in Appendix) down to gross profit only would be :

1975 Last Quarter :

Sales Revenue	$ 568 m
COGS	$ 539 m
G.P.	$ 29 m

i.e. virtually a break-even situation at gross profit. No allowance made in COGS for anything except budgetted FIE for Aroclors and Pyroclors. No extra PCB disposal costs are included.

If we use the same cost data and same selling prices but use provisional 1976 budget volumes our income statement for 1976 would be :

1976 Total Year :

Sales Revenue	$ 2796 m
COGS	$ 2696 m
G.P.	$ 100 m

i.e. a break-even situation at gross profit. However, included in COGS are non-recurring items amounting to approx. $ 850 m including Capital write off, dismantling and decontamination costs and Aroclor and Pyroclor FIE which would later be redistributed across the whole of Newport plant. Gross Profit without the non-recurring items would be $ 945 m and 34 % of sales. Whether to take the write-offs in 1975 or 1976 would be a policy decision.

If in 1977 we proceeded with the HB-40 expansion, total capital expenditure of $ 1.33 m would be required to change the diphenyl/terphenyl ratio on the pyrolysis furnace and expand HB-40 production to 5000 tonnes p.a. No income statement has yet been generated for this.

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APPENDIX I

Monsanto PCB Replacements

- Capacitor Impregnants

Two likely candidates :

MCS.1588 - Santosol* 100 + TXS
MCS.1238 - MIPB + TXS

Santosol 100 is benzylated ethyl benzenes,
MIPB is monoisopropyl biphenyl,
TXS is tolylxylylsulfone.

MIPB : could make a significant contribution to the polyphenyls complex since it would be manufactured from diphenyl.

Santosol 100 : might be a supply problem ex U.S.A. Alternatively Hüls, Germany have approx. 3500 tonnes of spare capacity for this type of product and should be considered as a possible supply source at least until MIPB was available ex Monsanto.

- Transformer Fluid Replacements

Two approaches are being pursued by St. Louis Research :

a) non-PCB chlorinated products fire resistant and biodegradeable,

b) high AIT fluids either silicate ester or hydrocarbon based.

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APPENDIX II

Sales Forecast Data

Assumes earliest date for ceasing for all PCB sales is October 1, 1975.

No extra sales of diphenyl which would result from an unbalance in the European capacity/ demand situation for this product are included.

1. 1975 Last Quarter :

Forecast for Products remaining after PCB ban is :

Product	Last Quarter 1975		
	tonnes	$/kilo	$ m
DQ molten	220	0.651	143
DQ flake	30	0.850	26
S.66	81	1.300	105
S.340	294	1.000	294
Total	625		568

2. 1976 (Volumes only) :

Product	1976 LRP tonnes	1976 Budget tonnes (provisional)	Sales $ m*
DQ molten	1766	1300	846
DQ flake	786	300	255
S.66	1120	650	845
S.340	380	850	850
Total		3100	2796

* using same prices as in last quarter of 1975 and 1976 Budget (provisional) volumes.

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3. 1977 (volumes only) LRP figures :

Product	1st Semester tonnes	2nd Semester tonnes
DQ molten	945	945
DQ flake	420	421
S.66	600	600
S.340	150	1900

New capital involved is :

Diphenyl debottleneck	$ 170 m
HB-40 expansion	$1150 m

start-up lid 1977 as per LRP.

4. 1978 (volumes only) LRP figures :

Product	tonnes
DQ molten	2022
DQ flake	900
S.66	1280
S.340	3720

Note : DQ = diphenyl

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APPENDIX III

Manufacturing Costs Data

Last Quarter 1975

		C.O.G.S.
Diphenyl molten 220 Diphenyl flake 30	250	£ 206 726
Santotherm 66 Santosol 340	375	$ 475 470
Aroclors Budget Fixed		23 265
Pyroclors Budget Fixed		4 314
Total COGS :		£ 234 305
		= $ 538 902 = $ 539 m

1976 : Basis HB-40 produced by 750 tonnes ex stockpile with 70/30 Ratio on Biphenyl furnace.

Diphenyl molten	1300 tonnes
Diphenyl flake	300 tonnes
Santotherm 66	650 tonnes
Santosol 340	850 tonnes

	$ M
COGS	1 850
FIE/Depr. Aroclor + Pyroclor	253
Capital write off Aroclor/Pyroclor and HCl with associated allocated capital	442
Desmantling + Decontamination	150
Total	2 696

1976 : Capital Expenditure on Pyrolysis Furnace of $ 177 000 to increase ratio diphenyl/terphenyls otherwise we stay on 1976 basis until Santowax pile runs out.

1977 : Require Capital Expenditure : $ 1 150 M for HB-40 expansion

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