SLIDE #5

The dielectric fluid market breaks roughly into two parts: two-thirds consumed in capacitors and one-third used in transformers. Let's look first at the U.S. capacitor market:

a. Remember that a capacitor is a device to store an electrical charge.

b. The dielectric fluid separates the two electrodes within the capacitor, assisting as well in the energy storage function.

c. PCB's possess an excellent ability to store energy, are very fire resistant, and have a very long functional life. However, the very thing that makes PCB's so fire resistant, makes them unacceptable to the environment because they accumulate instead of degrade.

d. Aroclor 1016 is the tradename of our PCB capacitor fluid with a 20M̄ pound market today. Our replacement candidate MCS 1238 is a blend of a biphenyl derivative and a sulfone. This blend has characteristics which would permit almost 25% less poundage being needed or roughly 16M̄ pounds.

e. GE has an estimated 44% market share and is almost four times the size of its nearest competitor, Westinghouse.

f. The end-use market for capacitors is:

-- 50% motor run primarily major appliances

-- 25% lighting, both fluorescence and street

-- 25% power, for use in transmission lines.

SLIDE #5a

Our reasons for selecting MCS 1238 as our PCB replacement are summarized on this chart -- Let's review the comparative characteristics of MCS 1238 versus Aroclor 1016.

9. The Monsanto/G.E. MCS 1238 Proposal was as follows:

Price @ $1.20/lb.

Volume @ 4M lbs/year for three years

Liquidated Damages starting @ $3M, declining over three years to zero.

This proposal was developed to generate $3M per year PI for Monsanto which would yield 23% net income return on investment, once volume reached 70% of capacity.

G.E. evaluated our proposal, looked at their alternates and came up with the following conclusions:

SLIDE #6

a. G.E. can make acceptable capacitors with DOP to serve all markets, thereby saving 60¢/lb. versus our candidate.

b. If G.E. can do it, their competitors will learn the technology to do likewise.

c. The capacitor market historically has been extremely competitive, low growth, and low

profit and will remain that way.

d. Some fragmentation to several available commodity chemical alternates will be inevitable as we will illustrate shortly.

e. Therefore, G.E. must select a commodity chemical solution to PCB's to stay competitive long-term.

10. The fundamental point here is that once you back off the superior performance of PCB's, particularly their excellent fire resistance, price becomes a dominant criteria for alternate selection. If there was a major flaw in our business planning for PCB withdrawal, it was in underestimating this point.

SLIDE #7

11. The rest of the industry, aware of G.E.'s position due to G.E.'s actions in the marketplace, reached the following conclusions:

a. DOP can be made to work in motor run capacitors.

b. If G.E. can make DOP work in power capacitors, others will try to do the same.

c. Fragmentation will take place in power capacitors including:

-- G.E. - DOP + Trichlorobenzene @ about 30¢/lb.

-- Westinghouse - MIPB or Santosol 100 @ about 67¢/lb.

-- Sangamo - DOP @ 27¢/lb.

-- McGraw - DOW's fluid which was developed with McGraw's technical help and upon which many patents are jointly held. McGraw does admit their odds for success now are at best slim @ $2.00/lb.

NOTE: These prices compare with PCB's today at 60¢/lb and $1.20/lb for our fluid MCS 1238 which would equivalently cost 90¢/lb.

SLIDE #8

12. Based on these conclusions reached by our customers, we have now embarked upon the following course of action:

a. We will have reviewed the phthalate ester opportunity with the plasticizer division, assisting them with our technical base.

b. We will offer Santosol 100, which is benzylated ethyl benzene, currently sold to NCR as a carbonless copy paper solvent to power capacitor producers.

c. We will put our replacement candidates back on the shelf.

d. We will redeploy our resources to growth projects within the division.

e. We will reaffirm Monsanto's PCB withdrawal.

SLIDE #9

13. Now that we have reviewed the background, conclusion and business direction taken for the capacitor portion of our dielectric business, let's take a comparatively quick look at the transformer market:

a. The transformer business, you will recall, historically has accounted for approximately one third of our dielectrics sales in the U.S. We said that out of a 30M lb. PCB sales year, 10M lbs. would be sold into "Askarel" or fire retardant transformers. These would typically account for only five to seven percent of the total output of transformers produced in the U.S. annually.

b. Functionally, transformers are devices for converting power at one voltage to equivalent power at a different voltage. The dielectric components from each other and to remove heat. Thus, good dielectric strength, heat transfer properties and fire resistance are the primary performance criteria.

c. Mineral oils are the most widely used transformer fluid in non-fire risk applications. Air cooled also account for a substantial portion of the market as well. PCB or Askarel transformers would be ordered where the unit is either in the midst of, or in close proximity to, people such as apartment buildings, hospitals, factories, etc.

d. Keep in mind that the pressure to remove PCB's from capacitors has been more severe than in transformers because:

(1) Capacitors are the largest consumption area;

(2) G.E.'s Hudson River plants are capacitor plants; and,

(3) Transformers are more truly closed applications because these large units are not normally discarded into the environment.

SLIDE #10

14. The situation then was Monsanto developed the best replacement candidate we could for transformers based upon a blend of hydrocarbon (alkylated biphenyl) and trichlorobenzene.

Our candidate: (1) was designed as a plug-in for PCB's in existing, as well as new, Askarel transformers; (2) was believed to be environmentally acceptable; (3) was designed to cost only fractionally more than today's PCB's; (4) could be produced with comparatively low level new capital; and (5) was based upon existing Monsanto raw materials.

Conclusions

a. Our own fire tests (at Monsanto's fire lab in St. Charles) showed our fluid to have less fire resistance than PCBs, but also less than silicone.

b. G.E. has said they could and likely would use straight TCB in their liquid filled fire resistant transformers.

c. Liquid silicone can be used as a replacement fluid in existing PCB transformers.

d. Transformer customers are moving rapidly away from Askarels by specifying air-cooled or oil-cooled units. PCB sales for new units are now projected to be near zero by early 1976.

SLIDE #11

15. Monsanto's course of action then is to:

a. Cease all work on formulation of non-PCB replacement transformer fluids.

b. Redeploy our resources to divisional growth projects.

c. Reaffirm Monsanto's PCB withdrawal.

III. SUMMARY

SLIDE #12

A. In summary, let me stress that we are not lightly walking away from the dielectric fluids business. Technically, as well as commercially, we believe we made every possible effort to replace our own PCB products with Monsanto replacement candidates. But, the fact is clear that once the electrical industry steppped away from the excellent fire-resistance of PCB's, alternate products of higher fire-risk must compete on the basis of price. That criteria of price has led this industry to existing commodity chemicals.

While we have specifically discussed our U.S. business directions with you today, the inevitability of our European PCB production following this same phaseout at perhaps a slower pace is unavoidable.

B. We do take some measure of accomplishment though in knowing that we have done at least three things we consider to be important:

1. We are getting the corporation out of the production of an environmental pollutant, probably before the end of 1977.

2. We are exiting the business profitably while covering all our phaseout costs, both $800M of net investment and $730M of decontamination and dismantling costs at our Krummrich facility.

3. We prevented what would have been, we believe, a serious capital mistake. Had we commercialized the in-house manufacture of MCS 1238 and its raw materials, an estimated $10.5M of new fixed capital would have been spent with the same eventual market movement to phthalate esters taking place anyway.

THANK YOU FOR YOUR TIME AND ATTENTION -- ARE THERE ANY QUESTIONS?