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DEPT• GROUP MANUFACTURING SUPPORT OPERATION
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SUBJECT• DRAFT OUTLINE OF KEY POINTS FOR REPORT

REF: TASK FORCE-PYRANOL TRANSFORMERS

copy for J. Vance Cox

D. R. Bair
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J. S. Nelson
R. C. Osthoff
G. I. Payne
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Gentlemen:

Here is my attempt to draft an outline of the key points for the report by the Task Force - Pyranol Transformers. The points are derived from what I think I have heard and read. Corrections, modifications and additions are welcomed. There is no editorial pride.

Because we are a team, each of you should review the total write-up in order to contribute with respect to both content and form.

You will note, however, there are names bracketed alongside the subject headings. This indicates the assignment of prime responsibility for furnishing the written material for that portion of the report. Please move forward with this work.

After the scheduled meetings by individual, I will fit the inputs into a more fleshed out draft that we will review collectively.

Very truly yours,

W. M. NAVE, MGR.
GMSO

/mpc

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GENP 006029

(Draft #1)

# TASK FORCE - PYRANOL TRANSFORMERS
# OUTLINE OF KEY POINTS FOR REPORT

I. Future Availability of Pyranol (Nave)

A. EPA will not ban PCB's within the next 5 years.

B. Monsanto is the sole domestic supplier of PCB's with sufficient capacity. PCB's are an unavoidable bi-product of other process operations (correct?).

C. Foreign sources are available but at prices 3 to 5 times greater.

D. The substantial usage of PCB's is by the capacitor and transformer industries per the following annual rate (million pounds):

| | GE | Industry |
|---|---|---|
| Capacitor | 9 | 27? |
| Transformer | 3 | 9? |
| | 12 | 36? |

E. The I&PC Dept. by 1980 will be employing fully a substitute for pyranol in the major portion of its output, - the small distribution capacitors (excluding power capacitors). This will reduce their annual usage from the current 9 million pounds to 3.5 million pounds.

If the capacitor industry so converts, the capacitor-transformer usage of PCB's will decline as follows:

| | 1973 | | 1980 | | PC Industry Change |
|---|---|---|---|---|---|
| | GE | Industry | GE | Industry | |
| Capacitor | 9 | 27? | 3.5 | 10.5 | (60)% |
| Transformer | 3 | 9? | 4 | 12 | 30 |
| | 12 | 36? | 7.5 | 22.5 | (38)% |

F. Conclusions:

1. PCB's will continue to be available but to strict EPS regulations.

2. Monsanto will continue to supply PCB's, however, prices may be expected to increase 3 to 5 times ($0.20/lb. to $0.60-$1.00/lb.).

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II Implications of EPA Regulations (Nelson)

(To be determined)

III Liability Exposure of GE (Jewell)

A. GE has prime accountability for incoming shipment of PCB material. Signed "hold harmless" agreement with Monsanto.

B. GE has prime accountability for outgoing shipment of transformers to customers.

C. Liability exposure re: inbound shipments - (to be determined)

D. Liability exposure re: outbound shipments.

- ? probability of one serious accident (spill) every 3 to 5 years for $? cost per accident

(Extremely preliminary evaluation)

IV Attitude of Customers (Rodgers-Payne-Bair)

A. Commonwealth Edison: Dry-type transformers fully for large commercial loads, - e.g. high rise buildings.

B. Duke Power Co.: Explored (in 1970) 167 KVA dry-type transformers for some apartment buildings.

C. Pacific Gas & Electric Co.: Will convert to dry-type transformers for all indoor applications.

D. Future posture re: EPA regulation (???)

E. Conclusions (????)

V Substitute Non-combustible Liquid (Osthoff)

A. Over 100 compounds investigated during the 25 years of 1948-1973; all rejected.

B. The highly bio-degradable AROCLOR 1016 that is suitable for capacitors is not acceptable for transformer applications.

C. Candidate substitutions were explored with Arthur D. Little Co. in 1973. Resulting recommendation: Make studies in seven areas.

D. A one-for-one substitute for pyranol is highly unlikely.

V (Cont'd.)

E. A compromise substitute liquid may be expected to

- increase costs
- derate transformer

F. Required development program

1) Manpower - facilities - cost
2) Activities
3) Candidate materials
4) Completion target date
5) Current best assessment of
   - probability of success
   - form of success

VI Business Significance of Pyranol Transformers (Rodgers-Payne-Bair)

MTD: Highly significant

- 14% of sales but 42% of net income
- Practices dry-type transformer technology but full conversion entails obstacles re: facilities, additional technology, market strategy, etc.

DTD: Potentially significant

- 2% of sales but attractively profitable, including a rapidly growing product line.
- Market transition to dry-type transformers will introduce a scope problem with the Specialty Transformer Dept.

PTD: Negligibly significant

- Only 4% of sales (but at 7% net ratio in a negative-profit Dept.)
- Limited market (multi-unit railroad passenger cars) that will decline 56% 1973-1977.

VII Alternatives (Rodgers-Payne-Bair)

For each Department:

| | Continue with Pyranol | Substitute Liquid | Dry-Type Transformer |
|---|---|---|---|
| 1) Required Changes | | | |
| 2) Competition | | | |
| 3) Costs | | | |
| 4) Other | | | |
| 5) Timing | | | |

W. M. Nave
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