Monsanto

FROM (NAME & LOCATION): P. B. Benignus-B2SC-St. Louis

DATE : April 4, 1974 CC:

SUBJECT : WESTINGHOUSE ELECTRIC RESEARCH CENTER
CHURCHILL BOROUGH
REFERENCE : PITTSBURGH, PA.

TO :

H. S. Bergen	W. R. Richard	C. F. Seger
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C. Paton	D. L. Mellon	
D. Wood	W. C. Moore	

Drs. Dakin, Byrne, and Mandelcorn - 4-2-74

Purpose of my visit was to present, describe and discuss our various new capacitor dielectrics with Westinghouse Research.

Westinghouse have been working on the same problems and appreciated learning our developments and views.

The reason Dr. Dakin continues to not communicate results of his work is because as he said, "The problems are difficult and refractory and they have no alternate similar to PCB's regarding not only fire-resistance, but also in certain other respects".

To put this into its proper perspective, the Westinghouse capacitor operation is primarily in power capacitors. In this area, of course, they find replacement of Aroclor 1016 difficult. They expect to continue to use it and have no urgent need for our "new development fluids".

However, Dr. Dakin asked that I review our new fluids with Don McClain and Geo. Mercier at Bloomington so that they are posted on what Monsanto could do in the event of an unexpected radical change from Aroclor 1016.

The following are some general comments:

1) Around 1950, Westinghouse tried to use dioctyl phthalate for power capacitors and found it hard to clean-up and unstable (I recall that PCB's were in very short supply at that time).

2) In 1951-1952, Westinghouse used tolyl xylyl sulfone purchased from General Aniline and Film Co. at $1.00/lb. to enhance the dielectric constant of capacitor Aroclor. They were not able to get the TXS sufficiently pure to rely on it. Dr. Dakin asked whether we are making TXS and perhaps selling it (also) for other purposes.

3) Westinghouse find it very difficult to make any kind of a 100% PPL film capacitor. They expect that McGraw/Edison will come to realize this, (as well as some other people).

4) Westinghouse asked whether we knew that GE lost a reported up to $2M on bad power capacitors due to trouble impregnating the PPL film, as result of a process change? (Yes, we knew about this as well as trouble elsewhere.)

5) As GE must now police their world-wide Magvar patents covering PPL film and Aroclor (or risk losing them) Westinghouse is being sued by GE, not-with-standing that Westinghouse purchase GE's film.

6) Westinghouse is in process of shutting down the Cleveland, Ohio, operation (effort) to make ballast capacitors. Westinghouse now believe that they may have made a mistake when they shut-down their capacitor plant at Vicksburg, Miss.

7) I gave Westinghouse the PCB hearings schedule in Washington. They will check their associates who are active on this so as to be kept informed. (Harry Sheppard who was at our IEEE meeting asked whether I was going to Washington tomorrow? I said that others from Monsanto are handling this.)

8) A representative from GE at our IEEE meeting asked Harry why did a Westinghouse Inerteen transformer fail recently in a Commonwealth Edison's system, killing 2 men? Also, quite recently, an askarel unit made by Ferranti-Packard exploded in the Commonwealth Edison system. Askarel was not at fault in these unfortunate failures.

9) A reliable source indicated that when soil borings were taken in the downhill direction and toward the river from the Tennessee spill, the level of PCB's decreased, but then shot up at the river bank. It is said that a steel mill up stream had used PCB fluid for quenching purposes.

10) Westinghouse continues to add anthraquinone to all of their capacitor Aroclor. When I asked Dr. Dakin about how much good it does, he said that, "Well, they still make some DC units".

11) Westinghouse, Bloomington, Indiana, are going all out after the series (EHV lines) capacitor business and have Don McClain in charge.

12) We discussed the possible different behavior and needs for epoxide in transformers vs. capacitors. In transformers, the arcing is likely to be rapid where as in capacitors the HCl generation is slow. This explains why Westinghouse do not feel that a fast acting epoxide such as Unox 4-206 is really needed in capacitors, i.e., a slow reacting epoxide will suffice.

13) A more difficult question discussed is, "Why is the reaction product of HCl and epoxide evidently less offensive than such as benzylchloride or chlorodiphenyl methane, or the well known addition chlorine derivative of biphenyl? Westinghouse believe that hydrogen bonding possible in the HCl-epoxide reaction product accounts for its apparent greater stability.

P. G. Benignus

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P. S. Originally, when we considered incorporating an epoxide into the capacitor Aroclor sold by Monsanto the fast reacting, relatively volatile, and difficult to handle Unox 4-206 sponsored by GE was in vogue, and restricted amongst other epoxides by their patents.

The Westinghouse belief that such a fast reacting epoxide is not needed for capacitors supports our own more recent belief that much slower reacting epoxides would suffice and that the one most readily cleaned and easiest to handle would be the most desirable. Also, as GE has relaxed (dropped) their attitude toward enforcing their epoxide patents, we find it easier to consider adding epoxide to our fluid where needed to compete with French and German capacitor Aroclor fortified with epoxide.

PGB