

STATEMENT BEFORE THE HOUSE COMMITTEE
ON MERCHANT MARINE AND FISHERIES

Gentlemen:

My name is Clifford Tuttle and I am president of Aerovox Industries, a manufacturer of alternating current capacitors located in New Bedford, Massachusetts. I welcome this opportunity to provide you what information I have on the use of polychlorinated biphenyl in capacitors and, specifically, small capacitors - by this, I mean the industrial type found in fluorescent lighting, street lighting, microwave ovens, television sets, air conditioners and most large AC motors. I use the term "small capacitors" to differentiate this type from the high voltage capacitors employed in electrical distribution systems by utilities and large users of electricity.

The small AC capacitor uses approximately half of the PCBs, tradenamed Aroclor, produced by Monsanto. Without these capacitors, the cost of lighting industrial buildings, public buildings, streets, etc. would more than double as would, obviously, the energy consumed. Some equipment, such as air conditioners and microwave ovens could not even function without this component. Therefore, it does serve a necessary purpose in our society.

PCBs are employed in electrical closed systems for four reasons. They are, in their order of priority:

1. Flammability - PCB in its application will not burn nor will it promote burning. All other known impregnating fluids will burn, causing serious safety problems when we consider the fact we are continually in contact with this type of capacitor.
2. Reliability - It is bad enough to have to change fluorescent tubes every two or three years; imagine the cost involved if we have to change the basic fixture that frequently. Presently, Aroclor 1016 units operate from 10 to 15 years without needing replacement.
3. Cost - A PCB impregnated capacitor is less expensive than any other alternative even when the fire retardant characteristic is ignored. This difference may vary from 25 to 100% depending upon the alternate impregnating fluid used.

4. Size - An Aroclor 1016 filled capacitor is smaller than any known replacement material can achieve. This not only makes for easier packaging by our customers, but, more importantly, it is on the existing sizes that all tooling has been made. A change in capacitor sizes will not only force capacitor manufacturers to retool, but will also impose a fantastic retooling bill on our customers. It will also make replacements unavailable for all existing applications.

Unfortunately, because of the media and, to some extent the EPA, we all tend to talk in the generic term - PCB. There are many formulations that fall into this category, and we would be much better advised to refer to them individually; Dr. R. Risebrough, Ph.D., Bodega Marine Laboratory stated at the Chicago Conference on PCBs that we should do exactly this. He stressed the fact that in all his studies he had yet to identify Aroclor 1016 in either the environment or the animal life which he has examined. For your information, both the high voltage and small capacitors are made exclusively with Aroclor 1016. The advantage of this material is that only one-half of one percent of it is made up of homologs that are not readily biodegradable; in contrast, other formulations are considerably more persistent. Fortunately, these formulations are used exclusively in large transformers where control to keep material out of the environment is much easier to exercise.

In presenting this analysis of the PCB problem, I would be remiss if I did not mention the large expenditure of time and money by industry - transformer and both large and small capacitor manufacturers - to reduce the amount of PCBs going into the environment. Admittedly, some companies have moved more slowly than others. The fact is that all capacitor manufacturers immediately switched voluntarily to Aroclor 1016 when it became available even though there was a significant premium in cost. All manufacturers are high-temperature incinerating their liquid wastes at significant costs. Each has dramatically reduced its liquid discharges; our company has gone from 5 to 10 lbs. per day in 1970 to .5 to 2 ounces presently. No stone is being left unturned in our efforts to make further progress. All small capacitor manufacturers are pooling their experiences and results on environmental efforts, to the extent permitted under antitrust.

I am neither a toxicologist nor a medical man, but I have read many papers and heard much of the testimony given over the last two years on PCBs. None of this has indicated that Aroclor 1016 has been

demonstrated as being harmful to wildlife, much less man. As a matter of fact, the only documented incident of a hazard to man's health occurred in Japan where a much more toxic formulation was involved. In this case, the formulation included another chemical compound and the PCB was directly ingested in large doses over a long period of time.

Still, a change is in order even though the environment appears to be cleaning up in almost all areas. At the Chicago Conference, our food, with the exception of certain species of fish, was reported to have improved significantly over the last three years in terms of PCB content. This may be due to decreased usage of PCBs; also, it is probably influenced by the capacitor industry's change to 1016. In addition, most waters and lakes have apparently improved, with the exception of the Great Lakes. Please do not misunderstand, I am not suggesting that we continue the use of Aroclor 1016, much less any other PCB compound longer than is necessary. I believe that due to past practices there has been significant damage to our environment and I do believe we should cease using this material as soon as is practical. The hooker is that last word...practical.

All of us would like to speed this up. Therefore, a total phase out of PCB is called for. The problem is how quickly this can be accomplished without completely closing down the construction industry and the manufacturers of certain appliances and increasing our energy bill drastically.

To date, the small capacitor manufacturers have yet to find an adequate replacement in terms of reliability and size for units made with Aroclor 1016. Two new fluids have been made available in the last three months that are quite promising. Both of these would involve significant compromises in personal safety, because they are flammable. Each would have some economic impact in the cost of the capacitor ranging from 25 to 100%. Still, these compromises appear to be justified.

Unfortunately, it will take industry at least 18 months to confirm the fact that either of these two fluids can even meet the minimum requirement of performance, safety and environmental hazard. It is my estimate it would then take a supplier 12 months to tool to produce a sufficient quantity to meet the needs of the capacitor industry. This means that a phase out of Aroclor 1016 cannot possibly be accomplished before July 1, 1978 assuming the new fluids prove to be satisfactory. I believe this is a reasonable target date that we should try to achieve.

This committee is primarily concerned with the effect, past and present, the use of PCBs is having on wildlife. I can only speak on this matter relative to what I have heard at hearings, and there is little doubt that the situation in the Great Lakes is a problem. The fact is that I am not aware of any point source in which capacitors, or even transformers, have significantly influenced the situation in these waters. I think the primary problem is the past usage of PCBs and the fact that deposits on the bottom are moving up the food chain in these waters which change very slowly. The same may be true of the upper Mississippi and the Hudson.

Our discharges go into Buzzards Bay and the tests we have had conducted by outside laboratories indicate that body of water now meets the proposed water criteria of 1 part per trillion. This is the case despite the fact that my company, as well as others in the area, employed in the past - prior to the time we knew of the potential hazard of PCBs - practices that did not minimize their introduction into the environment. In addition, we used formulations that were much less biodegradable than 1016. I think this evidence on the situation in Buzzards Bay is particularly important when you consider the fact that New Bedford's large fishing fleet up until 1970 was painted almost exclusively with materials containing 10 to 15% of PCBs. Obviously, this is just one of many other ways in which PCBs have been introduced into my local environment.

Perhaps the foregoing does not directly answer all your questions; I believe it is a fairly accurate presentation of the situation from a layman. If you have other questions, or if I can provide additional information, I will be glad to try.