

Monsanto

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June 6, 1985

Mr. Omar Halvorson
Deputy General Counsel
Bonneyville Power Administration
P.O. Box 3621
Portland, Oregon

Dear Mr. Halvorson:

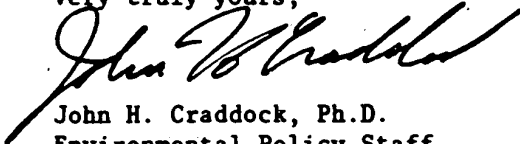
Enclosed are several technical articles which review and discuss the health effects of humans occupationally exposed to PCBs.

Dr. Gaffey reviewed the published epidemiological studies of PCB exposed populations, including workers who had been exposed to very high concentrations for 20-40 years (Brown and Jones 1981). His conclusions and summary (p. 294 & 295 of his article) are very straightforward and to the point.

In addition to the Gaffey paper, several others have reviewed the published literature on PCB health effects since 1981 including the Drill, Friess, Hays et al study for Edison Electric Institute and National Electrical Mfgs. Assn. (NEMA). These reviews and a few of the most important individual studies dealing with electrical equipment manufacture and maintenance are marked in red in the pamphlet published by the American Council on Science and Health (Jan. 1985) that I've enclosed also.

I hope this technical literature helps answer your questions. I'd be happy to discuss any other questions you have after you've had time to review this information. If you have questions related to legal issues involving PCB litigation and defense, I suggest you contact our attorney, Thomas Bistline, Esq. (314-694-2989).

Very truly yours,


John H. Craddock, Ph.D.
Environmental Policy Staff
Product and Environmental Safety Director

ve
Enc.

cc: T. M. Bistline
bcc: W. J. McCarville
P. S. Park

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PCBs: Is the Cure Worth the Cost?

A Report by the
American Council
on Science and Health

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PCBS: HUMAN AND ENVIRONMENTAL HAZARDS

F. M. D'Itri, M. A. Kamrin

Chapter 20 "The epidemiology of PCBs"

W. R. Gaffey

Butterworth Publishers, Woburn, MA, 1983

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Highlights of the Potential Health Effects in the Human From Exposure to Polychlorinated Biphenyls (PCBs) and Related Impurities

Executed for the National Electrical Manufacturers Association and the Edison Electric Institute by Dr. H. H. Hayes, Loomis, and Shaffer, Consultants in Toxicology

Introduction

Mixtures of chemicals known as polychlorinated biphenyls (PCBs) were manufactured commercially in the United States until 1977 and they are used throughout the world in a variety of applications. Over the years, people have been exposed to these chemicals both in the workplace and in the natural environment. Exposures in the workplace were generally far more intensive, especially in terms of inhalation and skin contact, than the typical low-level or occasional exposure in the natural environment. Much information on possible health effects resulting from PCB exposures has accumulated in the scientific literature, starting back in the 1930s. This report reviews this information and uses it as the basis for an objective assessment of the potential health effects of PCBs on people.

Methodology of the Study

Two teams of specialists, representing the disciplines of medicine, toxicology, pharmacology, biochemistry and epidemiology, participated in the study. The first team reviewed the PCB health effects literature in detail through 1981, and prepared draft reports on the relationships between PCB exposure and specific health effects in test animals and in exposed people. The second team of scientists from universities independently reviewed the draft material. Conclusions and opinions in the final report reflect contributions from both teams.

The health effects information reviewed was of two major types: first, results from large numbers of studies in which laboratory test animals were ex-

posed to graded doses over variable time periods; second, data effects detected in occupationally exposed workers as deduced from epidemiological and clinical studies. In the major recent studies, which are continuing, several thousands of occupationally exposed workers are being followed.

From the entire collection of data on people and test animals, conclusions are drawn as to the possible occurrence of specific potential health effects in people from exposures to PCBs that have been drawn. The results fall into two categories of effects, as follows:

Health Effects Observed in People and Animals

Two health effects, neither of which is serious, have been observed in workers occupationally exposed to PCBs and in experimental animals. They are:

1. A skin disorder known as chloracne. The intensity of this effect is related to degree of exposure and to PCB chemical structure. Chloracne diminishes on termination of exposure, and is not a serious health problem.
2. In the process of metabolism PCBs, excess amounts of certain enzymes (known as microsomal oxidases (MFOs)) are produced chiefly in the liver. Even following cessation of exposure, is not of itself a health hazard over the lifetime of the exposed person. At high levels, MFO levels can cause changes in the required dosages of medicines or other therapeutic agents that are