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Australian PCB study details capacitor plant worker problems

By DON JORDAN
H-T Environmental Writer

Much of the information detailing human health effects of poisoning by polychlorinated biphenyls (PCBs) is based on the Japanese *Yusho* incident, but a 1974 Australian study also provides a guideline of those health effects.

In a paper prepared by Dr. K.H. Ouw, Division of Occupational Health and Radiation Control, P.O. Box 163, Lidcombe, Sydney, New South Wales, Australia, for the New South Wales Health Commission, 34 occupational exposed workers in an Australian capacitor manufacturing plant were examined. The plant used the same Monsanto Arocior fluids used by the local Westinghouse capacitor plant.

"In this survey, 34 occupationally exposed workers were examined. Complaints consisted of a burning sensation of the face and hands, nausea and a persistent body odour. One had chloracne, five suffered from a rash on the legs and hands," notes the study.

The Australian report also notes that industrial exposure to PCBs has been reported to cause chloracne and that one study described ten cases of fatal PCB or naphthalene poisonings. In those fatal cases, each victim suffered from liver necrosis and cirrhosis and fat degeneration.

"Exposed workers tend to complain of eye, face and skin burning. The Arocior 'fume' is an eye irritant and has a pungent smell which often causes persistent body odour. One worker suffered from chloracne, without the systemic effects characterized by anorexia, nausea, rash on the face and hands and abdominal pain. Five workers complained of rashes on the hands and legs," notes the study. Also noted was a correlation between higher exposure levels and skin lesions of the workers.

"It can be seen that the impregnation (where the capacitor cans are filled with PCB fluid) workers tend to absorb more volatile compounds with low relative retention times whereas the process workers outside the impregnation room tend to absorb 'heavier' compounds, as shown by the statistical differences in the two groups," continues the Australian report.

Those more volatile compounds include biphenyl without chlorine and other chemicals with low vapour pressure like trichlorobenzene. The heavier components would be the more highly chlorinated biphenyls which show up in local watersheds, animals and city sewage sludge in Bloomington.

The report also notes that components of the Arocior fluids can be inhaled and absorbed through the skin. They can also be ingested as has been underlined by the levels in the general populace of the United States and Canada.

"It is essential that atmospheric contamination be accompanied by adoption of high hygiene standards and the avoidance as far as possible of skin contact," said the Australians.

Liver damages associated with PCB poisoning were not thouroughly studied and the report was issued prior to the Yusho follow-up study which detailed the finding of polychlorinated dibenzofurans (PCDFs) in the livers of the Japanese instead of PCBs.

Current thinking is that PCBs can be metabolized in the liver to become PCDFs.

A chemist working in the EPA's Office of Toxic Substances described PCDFs as "the second most toxic chemical we know of."

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