Monsanto

FROM (NAME & LOCATION) R. E. Kelly, M.D.

DATE April 24, 1969

SUBJECT CHLORINATED NAPHTHALENES IN FLUIDS

REFERENCE

TO W. R. Richard

cc H. S. Bergen
Richard Davis
E. P. Wheeler

Mr. Wheeler has told me of your discussion with him concerning the possible addition of chlorinated naphthalenes to our Santosafe class of fire resistant hydraulic fluids. Based not only on the reports of toxicity studies of these compounds and the chlorinated biphenyls as shown in the enclosures but, further, based on the potential hazards which might develop from the use of the combination of these materials, I would never approve the addition of chlorinated naphthalenes to our formulations.

As Mr. Wheeler told you difficulties with mixtures of chlorinated naphthalenes, chlorinated diphenyls and chlorinated diphenyl oxides developed in the mid-1930s. The products involved were known as "halowax" and were being used for impregnating electrical cable coatings. The summary of the number of investigations which followed the realization that workmen were being excessively exposed to vapors of the hot mixture and probable excessive skin contact indicates that there were several deaths due to acute atrophy of the liver and a number of non-fatal cases of liver disease. In addition serious acneform dermatitis developed in many workers with a lower degree of exposure.

Animal toxicity experiements originally implicated chlorinated biphenyls alone with the other materials. Subsequent experience, however, has indicated to our satisfaction that reasonable control of exposure to the chlorinated biphenyls will prevent any toxic effects. The control includes the avoidance of inhalation of vapors when the chlorinated biphenyls are heated in open containers or when there are leaks of the hot liquids. Secondly reasonable care to avoid prolonged and repeated skin contact is necessary. When these precautions are followed the industrial use experience with the chlorinated biphenyls has been singularly free of any difficulties.

Again, in the early 1950's problems arose with certain uses of the chlorinated naphthalenes as indicated in the enclosed copies from Patty's "Industrial Hygiene and Toxicology." A number of herds of cattle around the

country suffered fatalities and disabilities from a condition described as "hyperkeratosis". This apparently developed from cattle ingesting high pressure lubricating greases on farm machinery that contained chlorinated naphthalenes. As the time of the incident research sponsored by Monsanto and the U. S. Department of Agriculture led to a statement by the latter that the chlorinated diphenyls were not responsible for the cattle disease (even though some chlorinated diphenyls were being used in extreme pressure lubricants).

I do not mean to imply that the chlorinated naphthalenes are seriously toxic materials. Further I am sure that like many toxic or hazardous chemicals the chlorinated naphthalenes can be used safely. I am convinced however that it would not be good business judgement to allow the use of chlorinated naphthalenes in Monsanto products since if again, as in the past, any problems arose which might subsequently be proven to be due to the chlorinated naphthalenes alone, the chlorinated biphenyls would be considered to be partially if not fully responsible.

R. E. Kelly, M. D.

REK:cjs