bcc: Paul Benignus

April 26, 1966

Mr. Alvin W. Crow
Quarterman Maintenance
Public Works Department
U. S. Naval Station
Kodiak, Alaska

Dear Mr. Crow:

Your letter of April 15th has been referred to me for reply.

I have enclosed a booklet which describes fire resistant transformer fluids which have the generic name "Askarel." You will note on page 2 and page 3 of the enclosed Askarel Guide that there are several commercial or trademark types of formulations, some of which are described in tables 1 and 2.

Chemically these transformer fluids are mixtures of chlorinated diphenyl and trichloro and/or tetrachlorobenzene.

The history of the manufacturing, handling and use of these products dates back approximately 30 years. In that time there have been no cases of serious illness or toxic effects when simple precautions to avoid exposures have been followed. In the case of chlorinated diphenyls, a Hygienic Guide has been published by the American Industrial Hygiene Association for the materials containing 42% and 54% chlorine. The diphenyl in Askarel is diphenyl chlorinated to 60%. The toxicity characteristics then are believed to be similar to the 54% chlorinated material. The hazard (as differentiated from toxicity) is less in handling the 60% material since it is less volatile than the materials with lower degrees of chlorination.

The vapors from transformer Askarel are somewhat toxic and should not be breathed continuously over a prolonged period of time. With the fluid at room temperature we would expect that there would be some odor of the fluid. The level or concentration which is barely detectable by smell should not be hazardous. On the other hand, if the fluid is heated and vapors which are liberated are allowed to accumulate in an

unventilated room or area, the concentration could become significant. In general, people can detect a concentration in the amount of 0.5 to 1.0 mg per cubic meter of air which is regarded as the safe workroom limit for an 8-hour daily exposure (5 days a week, week in and week out).

Transformer Askarel accidentally spilled on the skin does not present an acute toxicity hazard nor will it cause serious irritation. It should be removed from the skin by washing with soap and water, however, because repeated and prolonged exposure may lead to drying and chapping of the skin because of the "solvent action" of the fluid -- which might be compared to the drying of the skin from using paint remover or many other solvents in a careless fashion.

Vapors released in high concentrations when the fluid is heated will cause eye irritation. It is pointed out on page 5 of the enclosed Askarel Guide that typical opthalmic solutions or ointments for relieving pain in the eyes may be used after flushing the eyes with large amounts of water.

Long range accumulative effects from exposure to Askarel fluids would not be expected unless workmen were exposed to high levels of vapors a number of hours a day, day in and day out or allowed the material to remain on the skin for prolonged periods of time and at frequent and repeated intervals. Excessive vapor inhallation or skin contact can lead to an effect on the liver as is the case with many chlorinated hydrocarbons. We have never heard of such effects in workers installing, repairing or servicing transformers, however. If exhaust ventilation cannot be provided to remove the vapors released by leaks, the workmen should be provided with respiratory protection equipment if repairs and servicing are required in an area where the vapors are irritating the eyes and nose or throat.

If I can be of any further assistance, please do not hesitate to let me know.

Very truly yours,

R. Emmet Kelly, M.D.
Medical Director

REK:mjb

Encl. Askarel booklet
Hygienic Guide "Chlorodiphenyls"

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