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February 19, 1964

Dr. Earl E. Weston
Medical Director
Vickers, Inc.
Box 302
Troy, Michigan 48064

Dear Dr. Weston:

I have been asked to forward comments relative to the hazards associated with use of Pydraul A200 with specific reference as to the toxicity of decomposition products.

A number of years ago we sponsored animal studies at Kettering Laboratories at the University of Cincinnati. The purpose was to determine the comparative toxicity of Pydraul type hydraulic fluids, petroleum base fluids, tricresyl phosphate and chlorinated biphenyls. The three latter materials had been used in industry for a number of years and the degree of hazard associated with them appeared to be well established.

The investigation included the exposure of several species of animals (cat, guinea pig, mice and rats) to atmospheres essentially saturated with vapors when the fluids were heated to moderately elevated temperatures. Secondly, animals were exposed to atmospheres saturated with vapors and decomposition products when the fluids were dropped on heated metal surfaces (an Inconel furnace) maintained first at a temperature of 1,000°F and secondly at a temperature of 1,250°F.

All animals survived without signs of intoxication when exposed to air saturated with vapors of each of the fluids for 7 hours per day for 4 days. When, however, the fluids were dropped onto the heated metal surfaces the decomposition products in each case caused immediate irritation to the mucous membranes, labored respiration and fatalities among some species in exposures as short as 20 minutes. In the case of the petroleum base fluid, the experimental equipment had to be modified so that the flame from the burning fluid would not be carried into the exposure chamber with fatalities caused by such exposure. Except for this modification, the experiments with all compounds were similar.

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The evaluation of all animal toxicity data available and many years experience with the use of the Pydraul fluids as heat transfer media or as hydraulic fluids leads to our following interpretation:

1. The daily use of these products in these applications presents no hazards when one follows the recommended precautions such as the use of the medium in a completely sealed system where there will be no leakage of liquid or the vapors when the material is heated.
2. The loss of fluid at a high temperature or by being sprayed onto heated surfaces (as a result of a broken line) presents a hazard to humans no more critical than with other type fluids. In either event the vapors or decomposition products would be so irritating that workmen would not remain in the contaminated atmosphere without respirators or gas masks. In those instances where breaks have occurred exposure to the workers long enough to shut off the system and evacuate the premises has not resulted in any ill effects.
3. Skin contact with the Pydraul fluids at normal temperatures does not present a hazard in terms of immediate or subsequent systemic effects if normal personal hygiene practices are followed. In other words, if there is massive skin exposure workmen should within a reasonable time remove contaminated clothing and bathe thoroughly.
4. Repeated or prolonged skin contact should be avoided in order to prevent possible irritation to the skin (because of the solvent properties of the fluid) and possible systemic effects. Again, normal personal hygiene should suffice as long as it is understood that workmen must not smear the liquid on the skin and allow it to remain.

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

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