September 21, 1956

Mr. Kenneth M. Morse
Chief Industrial Hygiene Engineer
United States Steel Corporation
525 William Penn Place
Pittsburgh 30, Pennsylvania

Dear Ken:

Thank you for your letter of September 12 requesting information on our hydraulic fluid Pydraul 150 and our product known as "Askarel." I have been out of town for the last ten days which accounts for the delay in my reply.

Askarel is a generic term for our product Pyranol 1470. This is a nonflammable oil used solely in the electrical industry for filling transformers where a nonflammable oil is desirable.

Pydraul 150 is a phosphate ester-based fluid with several additives to improve several specific characteristics not found in the base material.. I have enclosed two copies of our toxicity screening tests on the fluid. You will note that in the "Certificate of Analysis" by Scientific Associates the fluid is referred to as "08-57." This was an identification number for the fluid during research and development and is the same fluid which was renamed Pydraul 150 when the fluid was turned over to the sales group.

The toxicity report shows that the fluid was practically innocuous when fed orally to rats; animals survived single doses of 28.5 grams per kilogram with the only manifestation of any toxic effect, loss of appetite and severe diarrhea.

The fluid is apparently not readily absorbed by rabbits with any serious effects since animals survived a dose up to 9.5 grams per kilogram. With this dosage we normally find that animals display discomfort and loss of appetite due to being restrained and the large body surface area covered by the test material.

The numerical scores for irritation to the skin and eyes are less than we experience with a 10% aqueous soap solution when tested under similar conditions. We know from experience in humans, however, that the animal test does not indicate the pain which humans experience if there is accidental splashing in the eyes. We have had reports of severe smarting and pain

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when this has occurred with workers. All cases reported, however, have responded to the use of an ointment or solution containing an anesthetic such as 1% pontocaine and there have been no reports of damage to any eye tissues. Of course, in case of accidental eye contact, there should be immediate flushing with copious quantities of water as with any foreign body or industrial chemical. This is not to imply that if such flushing is not possible that there will be serious eye injury, but only to emphasize the usual first aid procedure for such an occurrence.

In regard to vapor inhalation, it appears that six hour exposures to heavy atmospheric concentrations are not lethal. Although Scientific Associates describes the experiment as vapor inhalation, their discussion points out that there was more than vapor present since "a moderately dense cloud of atomized Fluid 03-57 resulted from the operation." I believe that this indicates that the animals were subjected to an aerosol which one would certainly expect to be more severe than any vapor exposure.

Several of us in the Medical Department and our Research Department recently had occasion to inhale a mist of Pydraul 150 atomized with the equipment common in medical offices for nasal and throat sprays. Although our exposure was not prolonged, it was acute and our subjective response was as mild as that experienced with a petroleum or mineral oil fluid of similar viscosity.

I am sorry that I am not in a position to give you any information regarding the detailed composition of the fluid, but I think as a matter of fact that the toxicity of the fluid "per se" is more significant than the knowledge of the components. I can assure you that the results of more comprehensive toxicological research on the components confirm results obtained in the acute toxicity studies.

If I can be of any further assistance, please let me know. I look forward to seeing you in Pittsburgh at the time of the Foundation meeting, if not sooner. Dr. Kelly sends best regards to you and Dr. O'Connor.

Sincerely,

Elmer P. Wheeler
Assistant Director
Medical Department

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Enclosures 2

Two copies of SA-77

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