bcc: Dick Davis

April 4, 1966

Mr. John Versaak
Boeing Company
Dept. 6-6423
Bldg. 2.63-Annex A
Marginal Way
Seattle, Washington

Dear Mr. Versaak:

Confirming our telephone conversation last Thursday, I am forwarding the enclosed summary of toxicity safe handling information for our hydraulic fluid, Pydraul F-9.

You asked specifically about the possible hazards associated with the rupture of fluid lines and spraying the fluid on heated surfaces or molten metal. Paragraph 3 of the enclosure indicates briefly the results of experimental work done with animals at the Kettering Laboratories in Cincinnati about 15 years ago.

Depending on the temperature and available oxygen, the thermal decomposition products of Pydraul F-9 include carbon (soot), CO, CO_2, water vapor, HCl, phenols and aldehydes. Experiments conducted at the University Pharmacological Institute in Hamburg, Germany in 1964 confirm the earlier work done in Cincinnati.

From a practical standpoint, experience during the 15 years that Pydraul F-9 has been in use in American industry indicates that if there is accidental rupture of a line and fluid is sprayed onto a hot surface, a dense cloud of "smoke" made up of the above components is generated. The amount of the smoke will depend obviously on the volume of fluid which sprays onto the metal surface and the duration of the leak. The smoke has been quite intensely irritating to the eyes, nose and throat of any workmen exposed. In no case has there been serious systemic effects in exposed people. In every case there has

been sufficient time for the personnel to shut down the equipment and leave the contaminated area until it could be cleared by ventilation.

The above information pertains essentially to all of our products in the Pydraul series. I am sure our technical representatives can assist you better than I in selecting the appropriate Pydraul to meet your requirements.

Very truly yours,

Elmer P. Wheeler
Manager, Environmental Health
Medical Department

EPW:mjb

cc: D. E. Eriksen - Monsanto, Los Angeles

Note to DEE and DDavis -- Mr. Versack rather guardedly described his prospective use as involving "stretching titanium" with temperature on the one hand being about 1500°F, with the possibility on the other hand of temperatures reaching 6000°F.

EPW