

HYDROGEN SULPHIDE MONITORS RESPONSIVENESS TO OTHER REDUCED SULPHUR GASES

FOREST INDUSTRY HEALTH RESEARCH PROGRAM

c/o Pulp and Paper Forum
#100-620 Royal Avenue
New Westminster, BC
V3M 1J2
Telephone: (604) 777-1533
Facsimile: (604) 777-1567
Website: <http://www.paperforum.com>

The FIHRP Forest Industry Health Research Program has completed a study to determine if Hydrogen Sulphide Gas Monitors currently used in the pulp and paper industry provide adequate protection against other reduced sulphur gases including, methyl mercaptan, dimethyl sulphide and dimethyl disulphide. A copy of the report is now available to members titled: **"Hydrogen Sulphide Monitors Responsiveness to Other Reduced Sulphur Gases"**. To request a copy, call Agi Lee at the Pulp and Paper Forum at (604) 777-1533, send a fax to (604) 777-1567, or e-mail alee@paperforum.com. Non-members of the Forum may be charged for the reports. **Member companies can download a copy of the report from the Forum web site:** www.paperforum.com

Two pulp mills and one pulp and paper mills participated in this project. The objectives of this project were to determine: if fixed hydrogen sulphide monitors currently used in the mills respond to other reduced sulphur gases; if fixed hydrogen sulphide monitors provide adequate protection to mill employees against other reduced sulphur gases; and if the monitors responsiveness are influenced by exposure to multiple reduced sulphur gases.

The project was completed in three phases. Phase one consisted of gathering information on the make(s) and model(s) of fixed hydrogen sulphide gas monitors(s) used in FIHRP member mills, and obtaining pre-calibrated units of each of the hydrogen sulphide monitors used by participating mills from the manufacturers/suppliers.

Phase two of the project involved testing the monitors received from the manufacturers in the laboratory. The monitors were individually tested for their response to hydrogen sulphide, methyl mercaptan, dimethyl sulphide, and dimethyl disulphide. Each monitor was exposed to these individual reduced sulphur gases at concentrations equal to their Workers' Compensation Board of British Columbia Exposure Limit, or an alternative criteria level determined from other exposure guidelines.

The final phase of the study involved field testing of the hydrogen sulphide monitors in use at one of the pulp mills participating in the project. At the pulp mill, each monitor was tested with hydrogen sulphide to determine the monitors' responsiveness to the gas. Following the tests with hydrogen sulphide, the monitors were exposed to methyl mercaptan and to a combination of methyl mercaptan and hydrogen sulphide gas.

In total, eight monitors were tested in the laboratory for their responsiveness to hydrogen sulphide and other reduced sulphur gases. Five of the monitors employed electrochemical sensor technology and three used solid state sensors. All of the sensors tested in the laboratory were found to adequately respond to hydrogen sulphide. None of the monitors were found to respond adequately when exposed to methyl mercaptan, dimethyl sulphide or dimethyl disulphide. As a result of poor responses for individual gases, tests using mixtures of reduced sulphur gases were not carried out.

At the pulp mill chosen for the field testing, all but one of the gas monitors tested were found to respond inadequately when exposed to hydrogen sulphide. It was noted that although the hydrogen sulphide monitors tested provided less than adequate response, the hydrogen sulphide monitors still provided adequate protection because the alarms were set at 5 ppm (50% of the Exposure Limit). All of the monitors tested at the pulp mill were found to have an inadequate response to methyl mercaptan. The hydrogen sulphide gas monitors in the field were not tested for their responsiveness to dimethyl sulphide and dimethyl disulphide.

The hydrogen sulphide gas monitors tested in the field with a mixture of hydrogen sulphide and methyl mercaptan were found to respond additively as expected for the individual gases.

The results of this study indicate that none of the hydrogen sulphide gas monitors currently used in the pulp and paper mills participating in this study responded sufficiently to provide adequate warning of employee exposures to methyl mercaptan, dimethyl sulphide or dimethyl disulphide.