

## INDUSTRIAL HYGIENE

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### INTRODUCTION

Industrial hygiene involves the recognition, evaluation and control of chemical and physical agents that could cause adverse effects to workers' health. We will briefly examine one area of industrial hygiene: exposure to chemicals, specifically exposure to anti-sapstain and wood preservation chemicals.

The Forest Industry Industrial Health Research Program (FIIHRP) provides information on chemical handling concerns. It was set up to help B.C. forest industry companies and unions make informed decisions on chemical hazards. The program is administered by joint union-management committees. They decide which projects are needed to assist wood products operations, pulp and paper mills, and forestry and logging operations. Project work is carried out by B.C. Research; an independent, non-profit research organization. FIIHRP reports, manuals, audio-visual materials and newsletters can be obtained by contacting the Council of Forest Industries of B.C..

In the wood products manufacturing sector, a major emphasis of FIIHRP has been on use of anti-sapstain chemicals. During 1987, one project was done at a wood preservation plant; a study of worker exposure to CCA.

### ELEMENTS OF AN INDUSTRIAL HYGIENE PROGRAM

#### Recognition

The first step is to find out everything you can about the chemical you are handling. What are the health effects of a short term (acute) exposure to a high concentration? What are the effects of long term (chronic) exposure to low concentrations.

Start by obtaining a Material Safety Data Sheet (MSDS) from the chemical supplier. MSDSs usually cover acute exposure well; the effects of accidental exposure to high concentrations. MSDSs rarely cover the long term effects of exposure.

Next, ask the supplier for more information: what are the known or suspected long term health effects; what additional information is available from trade associations; what training materials are available?

Additional information can be obtained from the FIIHRP Materials Handling Manual, Pocket Manuals and reports on anti-sapstain chemicals.

A valuable source of information on the toxic effects of wood preservation chemicals is the "Codes of Good Practice" recently prepared by Envirochem Services. For chlorophenates, refer to the "Codes of Good Practice" prepared by Environment Canada and Ministry of the Environment.

Since these materials provide information on the toxic effects of wood protection and preservation chemicals, we will proceed to the next step in an industrial hygiene program.

### EVALUATION

Evaluation of the health hazard associated with a job is critical step. If a worker handles a toxic chemical, but the job involves no contact with the chemical, then there is little risk of a health problem from long term exposure. Conversely, a chemical which is not acutely toxic may represent a risk to workers' health if poor handling practices exist in the mill.

Evaluation of health hazards can be done by observation of job procedures and by measurement of worker exposure.

Observation is an important part of evaluating health hazards. Is the major route of contact with the chemical by breathing of airborne contaminants or by skin contact? Do operating practices produce dusts, mists or vapours? Observation cannot always predict exposure. Variations in job procedures from one employee to the next may have an important influence on the amount of chemical taken into the body.

Measurement of exposure is often necessary to evaluate an individual's exposure. It may be necessary to measure the amount of chemical in the breathing zone of a worker. Analysis of urine or blood samples may be necessary to determine worker exposure, particularly if skin adsorption is the major route of entry for the chemical into the body.

### CONTROL

Effective control of excessive exposure to chemicals depends on how well the health hazard has been evaluated. The actions needed to prevent excessive exposure can vary considerably throughout a mill.

Delivery of chemical to the plant has the potential for intermittent, short term exposure to concentrated product. Even though accidents occur rarely, precautions must be in place to prevent splashing onto eyes and onto skin, and breathing of mists, dusts, gases or vapours. Showers and eye-washes need to be close to areas where concentrates are handled.

Application usually involves exposure to diluted treating solution. The major health concern is potential long term effects of repeated exposure by inhalation of airborne or by skin adsorption.

Handling treated lumber or preserved poles and ties usually requires protection to prevent transfer of chemical to skin. In addition, customers should also be considered and appropriate advice given. For example, pentachlorophenol and chlorophenates can be transferred to skin and rapidly adsorbed in the body. Customers should be advised to wear gloves. If treated wood will be sawed, customers should wear dust masks.

The best way to control exposure to chemicals is at the source. If an operation produces dusts, vapours, mists or gases, it is much better to install good local exhaust ventilation than to require workers to wear respirators. If respirators must be worn, workers need to be thoroughly trained in fitting and maintaining respirators.

Effective ways to prevent skin contact are to change the process or to wear impervious gloves and clothing. Since the chemicals used in wood treatment and wood preservation have the potential to cause problems through skin contact, gloves, long sleeved shirts, aprons and rain suits will often be necessary.

Personal hygiene is very important in reducing the effects of skin contact. Washing hands and arms frequently with mild soap and water is important in limiting skin exposure. Washing hands before going to the toilet is very important. Coveralls should be changed immediately if they become contaminated.

To prevent chemicals from being swallowed is largely related to personal cleanliness. Workers should wash their hands before eating, drinking, smoking or chewing gum.

### CONCLUSION

The essential ingredient that makes an industrial hygiene program successful is education. Workers must know the hazards of chemicals and how to do the job in a way that minimizes exposure. Informed workers can often come up with the best solutions to control their exposure to chemicals.