

THE INDUSTRIAL HEALTH RESEARCH PROGRAM IN THE FOREST INDUSTRY

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In 1976, the Executive Committee of COFI commissioned a study by B.C. Research on potentially hazardous materials used in industry. Completed in September 1978, this report was reviewed by an *ad hoc* committee and as a result, the industry laid the ground work for the establishment of the Forestry Industry Industrial Health Research Program in 1979. The objective was to acquire reliable information on, and develop guidelines for, the handling of materials in the employee environment for which little or no information was available. FIIHRP contacted B.C. Research to carry out this work over a five year period at a cost to the industry of \$750,000.

In a statement of policy, the guiding principle of the industry is that employees should not be subjected to unnecessary risk to health in the handling of materials employed in the various processes associated with the industry's work.

FIIHRP is administered through a Steering Committee whose membership includes representatives of COFI, PPIRB, FIRL and the major labor unions of the Forest Industry. An Advisory Committee is accountable to the Steering Committee and its task, in conjunction with B.C. Research, is to identify priority areas of research, recommend safe handling procedures for various materials, and maintain liaison with appropriate producers and agencies.

Three sector subcommittees, representing wood products manufacturing, forestry and logging, and pulp and paper, have chairmen on the Advisory Committee. In addition, a Manual Subcommittee oversees the production of the materials handling manual. There was also established a Liaison Committee, which was sponsored by the industry and the IWA in May of this year, to review the feasibility of pentachlorophenol (PCP) and tetrachlorophenol (TCP) health studies.

In June 1979 a program of research was formally started and expenditures were approximately \$70,000 by industry and \$16,000 of a \$50,000 development commitment by B.C. Research. In 1980, expenditures reached the \$170,000 level, in addition to the balance of the B.C. Research commitment, and in 1981 they were expected to be in excess of \$250,000. In 1981, the activities of this research program were as follows.

WOOD PRODUCTS MANUFACTURING SECTOR

Measurements of chlorophenolate levels on the inside of gloves were made to determine the efficiency in protecting the hands against contact with anti-stain agent.

The result of these studies identified that improved personal hygiene practices and provision of facilities to reduce contact of workers with chlorophenates was required.

It was identified that a method of determining dust content in air was required for wood dust studies in cedar sawmills, and a new particle size classifier was produced and is now undergoing field trial in two mills.

PULP AND PAPER SECTOR

Gas concentrations in kraft mills have been studied, with one objective being to determine if there were differences between interior mills that were closed up in the winter, and coastal mills.

Dimethyl sulphide has been identified as a major potential sulphur contaminant. One further study is planned for later this year. The study is intended to provide an overall assessment of the

- Vapours: Ensure adequate ventilation to minimize inhalation. Keep lids on solvents and cleaning cans and other volatile materials to reduce vapor emissions.
- Liquids: Keep hands clean. Wash before smoking or eating. Avoid putting on contaminated clothing so that skin contact is minimized.
- Solids: Avoid inhalation of dust or skin contact where moisture will dissolve the solid and cause a reaction.

When considering problems due to vapors, the aromatic liquids and petroleum-based compounds are the ones to be particularly careful with, in terms of inhalation.

The above rules for materials handling may be briefly summarized:
if it smells, keep it covered;
if it is liquid, avoid contact; and
if it is dust, avoid inhalation.

As the Association of Wood Preservers, you might ask "How do I find out more about the materials with which we deal?" Environment Canada is putting out a report emanating from EVS Consultants re: *Development of a Recommended Code of Good Practice for Operating Chlorophenol Wood Protection Facilities and for Storing and Transporting Chlorophenol Fungicides*. This is a highly technical article and has yet to be finally passed, but I suggest you keep tuned in to Environment Canada as to when this manual will be available.

Since the chlorophenols are of particular current interest and the IWA has taken a position that it would like to see them replaced, a few remarks on chlorophenols might be appropriate.

As many of you may be aware, Forintek Canada Corp. has been asked by the industry to evaluate replacement chemicals, for chlorinated phenols currently used in the protection of unseasoned lumber against stain and mould. Five chemicals are being tested including, copper-8-quinolinolate which would appear to be a promising candidate. An actual industry test might take as long as two years to determine that the chemical is able to protect lumber for the export trade against attack by mould and stain fungi. In addition, further examination by Agriculture Canada is under way for approval of these alternative chemicals and health studies might be necessary to ensure that in fact these materials are less hazardous than chlorophenols.

In the summary paper on NaTCP/PCP's the general health effects are described as follows:

Most of the health effects from chlorophenols described in the medical literature have been caused by contact with concentrated PCP solutions, rather than with the diluted aqueous NaTCP/PCP solutions used for sapstain control. Many of the reported short- and long-term health effects of TCP and PCP have been ascribed to chloro-dioxin and dibenzofuran impurities. However, impurities in industrial TCP and PCP were not adequately characterized until recently because of difficulties with analytical techniques, and even today's analysis results must be interpreted with caution. There are many gaps in the reported toxicity data and, overall, uncertainty regarding the role of contaminants in the evaluation of potential hazards. An extreme view has been expressed by Van Gelder, University of Missouri, that "if one eats PCP, the amount of PCP swallowed will kill you several times over before the dioxin concentration does". Under conditions present in the majority of British Columbia sawmills, absorption of NaTCP/PCP solution through the skin is more important than intake through breathing the vapour, or swallowing the chemical.

Regarding the storage, metabolism and removal of PCP from the body, in animals and humans most of the PCP taken up by the body is discharged unchanged in the urine. Four stalwart human volunteers who drank 0.1 mg/Kg body weight of PCP and water eliminated approximately 90% of the material within one week. In a summary paper it points out that skin absorption is probably the most important source of NaTCP/PCP intake by sawmill employees. Most PCP taken into the human body is discharged rapidly, but a portion may be retained in the liver during extended periods of exposure and slowly eliminated when contact with the chemical ceases. Tests using animals have not shown teratogenic or carcinogenic effects from TCP and PCP and most biological tests for mutagenicity were negative.

concentrations of gas contaminants in working areas at a representative cross section of the kraft mills in the province.

FORESTRY/LOGGING SECTOR

A study is under way to determine the uptake of 2,4-D by applicators using the hack and squirt technique.

In order to carry on the work of the Research Committee, B.C. Research has liaised with many national organizations and is currently checking out some health study results identified by a Swedish association on PCP's and TCP's.

MATERIALS HANDLING MANUAL

Information sheets on 70 chemicals used in the industry have been prepared and distributed by FIIHRP. Sheets for another 16 chemicals are being reviewed by the Manual Subcommittee. Data has been collected and compiled in preparation for review by the Committee on over 100 proprietary chemicals, including water treatment products, cleaning agents, defoamers, slimicides, pitch dispersants, and resins and glues.

HAZARDOUS CHEMICAL REPORTS

Summary reports have been prepared and distributed to subcommittee members in the uses, properties and health hazards of PCB's, 2,4-D, chlorophenates, and hydrazine. A report on formaldehyde is in the final stages of preparation.

These summary reports on hazardous chemicals represent a substantial literature search by B.C. Research so that the findings can be used to initiate proper handling procedures for the industry. These summary reports will be available to Forest Products Industry members of COFI and the Industrial Relations Bureau upon request.

For 1982, budgets are being submitted for further work on dust content in air, and including identification of controls on anti-sapstain chemicals, with particular reference to industrial hygiene and waste disposal practices. Also proposed are studies in plywood mills, (i) to identify the best methods of controlling veneer dryer emissions, and (ii) industrial hygiene research on formaldehyde emissions and isocyanate patching compounds.

Work will continue on gas analysis in kraft mill areas; on respirator performance and maintenance; and on chronic health effects of chlorine, chlorine dioxide, TRS (Total Reducible Sulphur) and turpentine vapor. Mill atmospheres will also be examined for possible contamination by mutagens and pathogenic bacteria.

The budget also includes industry-wide studies related to liaison with industrial health groups, further work on the materials handling manual, education of various industry personnel and further summary reviews of suspected or potential carcinogens used in the forest industry.

As was discussed previously, the materials handling committee is reviewing over 100 proprietary chemicals and it is expected this information will be of great value at the plant level.

I recently reviewed this same program at a meeting of our Occupational Safety and Health Group in the plywood plant and tried to put the matter of materials handling into a simple perspective. I would offer the following rules for handling vapours, liquids or solids:

At all times protective clothing should be worn to minimize exposure. This includes respirators or face masks where indicated.

The White Paper also proposes that in personal hygiene, employees handling the solutions of anti-sapstain chemicals should:

- wear plastic or rubber gloves, *not* leather;
- wear gloves which are in good condition;
- rinse outside of gloves before removing them and wash gloves inside and out at the end of each shift; a practical alternative may be to wear cotton liners instead and keep them freshly laundered;
- wear a plastic or rubber knee-length apron;
- keep footwear covered with a waterproof material;
- wash hands with soap and water before eating, drinking, smoking or going to the toilet;
- not carry cigarettes in work clothes;
- shower and change at the end of the work day.

I think this emphasizes the 3 simple rules:

- if it smells, keep it covered;
- if it is liquid, avoid contact; and
- if it is dust, avoid inhalation.

For those of you interested in the FIIHRP program, members of COFI have information available, and George Norris at COFI can be contacted for further details.