Approved March 20, 1984
Date

MINUTES OF THE HOUSE COMMITTEE ON LABOR AND INDUSTRY.

The meeting was called to order by Representative Arthur Douville at
Chairperson

9:05 a.m. ~~p.m.~~ on February 14, 1984 in room 526-S of the Capitol.

All members were present except:

All members were present

Committee staff present:

All present

Conferees appearing before the committee:

Representative Ardena Matlack
Mr. Sidney A. Shapiro, KU
Mr. Richard D. Cordry, KS Trial Lawyers
Mr. Wayne Maichels, AFL-CIO
Miss Lynelle King, Executive Director of KS State Nurses Assoc.
Mr. Matt Selby, Sierra Club

Chairman Douville called Rep. Matlack to the speakers stand to give testimony to the committee on H.B. 2770. See attachment #1.

Mr. Sid Shapiro was the next speaker and spoke in favor of H.B. 2770.

Mr. Richard Cordry also gave testimony in favor of H.B. 2770. In his testimony he sited a specific case he worked on representing an employee who was exposed to a toxic substance. He also gave the committee members attachment #2.

Mr. Wayne Maichel gave testimony in support of H.B. 2770.

Miss Lynelle King gave testimony in support of H.B. 2770. See attachment # 3.

Another conferee who spoke in support of H.B. 2770 was Mr. Matt Selby. Here are some of Mr. Selby's reasons for support:
1. The bill identifies to workers the toxic substances in the work place, the effects of those substances and the circumstances under which these effects are produced.
2. It provides for education of training to workers who might regularly expose themselves to toxic materials.
3. It enables employees to have access to information on toxic materials they work with the dangers involved with those materials, how to avoid such dangers and the emergency procedures necessary if a dangerous situation does arise.
4. This bill requires employers to keep a record of every employee who handles or uses toxic substances.

The committee then asked questions of the conferees. The meeting was adjourned at 10:00 a.m.

Unless specifically noted, the individual remarks recorded herein have not been transcribed verbatim. Individual remarks as reported herein have not been submitted to the individuals appearing before the committee for editing or corrections.

Labor & Industry 2-14-84

Visitors	Representing
Rob Hodges	KCCI
~~Ross Martin~~	KPC
Sidney A Shapiro	KU
Richard D. Cordry	Ks. trial lawyer
Lynelle King	Ks State Nurses' Assn.
Matt Selby	Sierra Club
PAUL MAGES	Ks Termite & Pest Control Assn
Wayne Kitchen	Ks. Dept. of Human Resources
RICK EMEWOLD	AT+T
Ken Lassiter	KS C.P. Association
Ken Johnson	" " "
John Koch	Capitol
Max Foster	Ks. Board of Agriculture
Harry Pflaster	Ks AFL-CIO
R.E. "Jack" DUNCAN	KS. wine & spirits wholesalers Assn.
DAN MORGAN	AGC of KS.
Ralph McGee	KS. AFL-CIO

STATE OF KANSAS

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CLEARWATER, KANSAS 67026

TOPEKA

COMMITTEE ASSIGNMENTS
MEMBER: FEDERAL AND STATE AFFAIRS.
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GOVERNMENTAL ORGANIZATION
JOINT COMMITTEE ON ADMINISTRATIVE
RULES AND REGULATIONS

HOUSE OF
REPRESENTATIVES

TESTIMONY - HOUSE LABOR AND INDUSTRY COMMITTEE
Chm. Rep. Arthur Douville

BY REP. ARDENA MATLACK
February 14, 1984

Re: HB 2770

HB 2770 is a culmination of a growing awareness of the very real necessity of living with chemicals safely. It began when the people of Furley became very concerned about the proposed Furley hazardous waste site. My interest there involved me in the first hazardous waste bill for the State of Kansas and in various amendments to that act since that time. Since the end of 1976 and up to now, I have heard of the black lung disease in the coal mines across the country and the brown lung disease. Several years ago we heard about the damage from breathing asbestos in the insulation of our schools and factories. According to the National Institute of Health, 11 million workers have been exposed to asbestos. In 1978 the U.S. Department of Health, Education, and Welfare concluded that 5.6 million workers may die of diseases resulting from workplace exposure to asbestos. Then, we heard about Agent Orange being used in Vietnam and damages from that chemical being recognized many years later. We know now that some diseases can occur from exposure to chemicals possibly forty years after the exposure has occurred. The NIOSH studies estimate that 100,000 people die annually from occupational disease---many from latent exposure.

The Silkwood case hit the headlines and lately we have heard about damage and death from Benzine. These problems have been gnawing at my conscience---what are we doing to our fellow human beings? We are living in a chemical society but we must not allow the lives of our fellow human beings to be destroyed by lack of knowledge.

Then, last summer, I saw an article named 'Hazardous Materials: How Much Should Workers Know?" from the State Legislatures

Magazine. I realized that this was a partial answer to the problem that had been gnawing on my mind. During the last fall, I asked our Revisor, Mr. Furse, to provide copies of the laws from the States suggested in the article, picked out the things that I felt would answer our problems best, and you have the end product before you. This may not be the perfect answer but if it would prevent one death in the State of Kansas---and I believe it will prevent many plus preventing much suffering---then it is worth the effort.

This bill will allow employees access to information they should rightfully have when working with toxic substances. This bill will allow employers access to information that they should rightfully have without delays. This bill will require records to be kept so that we can build a history of toxic substances and their effects.

HB 2770 allows employees that are routinely exposed to toxic substances to be given training for safe handling of such substances. It allows trade secrets of manufacturers to be kept by registering the trade secrets with the secretary, along with information for correct handling of the substance. It includes safeguards for employees who have filed complaints so they will not lose benefits, employment, or be discriminated against.

There is a civil penalty section as well, stating that intentional violators of the act will be guilty of a misdemeanor with a fine of not more than $500 and/or imprisonment for not more than 30 days on the first offense with subsequent offenses having greater penalties. The definition section at the beginning of the bill is self explanatory. Remember, the bill states that the employer must post a sign if toxic substances are in use and provide safeguards or provide training if the employee is routinely exposed. Many industries do this. Then, the employer has 72 hours or three days, excluding Saturdays, Sundays, and holidays to furnish this information. If the information cannot be provided in that time, the employee shall not be required to work with that substance until the information is made available. This is a protective measure for both the employee and employer.

We have been concerned with protecting the public for many years. In 1932, from a study about the health of workers, the

labeling of chemicals was proposed. Finally, in 1976 the Consumer Product and Safety Protection Act was passed. In 1977, the EPA Toxic Substance Control Act was passed. Why shouldn't we protect the workers who handle those labeled chemicals in their most pure concentrations? Kansas Industrial and Public Safety Division receives about 6,000 inquiries a year from insurance companies, and about an equal amount from employers and employees.

This bill will not be expensive. A little training time invested in employees that are routinely exposed will be cheaper, in the long run, and most employers that would be required to have training are already doing this. Other employees can put up a hand-written sign to comply. The data is already available. It will merely take a 20¢ stamp or a phone call to get the information. Soon, information will automatically accompany the first order from the manufacturer.

There is absolutely no reason that employers should protest or not be willing to give such information to employees. This bill is for the benefit of the employee, the employer, and the public as a whole.

We must learn to live safely with chemicals. Kansas must be a leader in providing a healthy workplace for its citizens. This bill will further that goal, therefore, I urge you to support HB 2770.

PLAINTIFF'S EXHIBIT 407

Charles R. Sh

#2

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-269 599

Informing Workers and Employers about Occupational Cancer

National Research Council, Washington, D C

Prepared for

Occupational Safety and Health Administration, Washington, D C

Jun 77

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15. Supplementary Notes

16. Abstracts

This report discusses the issues involved in informing the employee and the employer of the hazard of occupation-related cancer. It includes broad recommendations to the Occupational Safety and Health Administration (OSHA) of the Department of Labor on the content, manner of presentation, and target audience of the Occupational Cancer Information and Alert Program undertaken by OSHA.

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INFORMING WORKERS AND EMPLOYERS ABOUT OCCUPATIONAL CANCER

Committee on Public Information in the
Prevention of Occupational Cancer

Division of Medical Sciences
Assembly of Life Sciences
National Research Council

Supported by the Occupational Safety and
Health Administration, U. S. Department
of Labor, Contract No. J-9-F-5-0122

National Academy of Sciences
Washington, D.C.
1977

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NOTICE

The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the Councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The members of the Committee responsible for the report were chosen for their special competences and with regard for appropriate balance.

This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

INFORMING WORKERS AND EMPLOYERS ABOUT OCCUPATIONAL CANCER

CONTENTS

COMMITTEE ON PUBLIC INFORMATION IN
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PREFACE

In the spring of 1975, the National Cancer Institute (NCI), of the National Institutes of Health, Department of Health, Education, and Welfare (DHEW), and the Occupational Safety and Health Administration (OSHA), Department of Labor, signed a memorandum of agreement. This document stated that the Cancer Control Program of the NCI was established by Congress to develop and implement a coordinated effort to reduce the morbidity and mortality from cancer by educating the public with regard to social and industrial conditions or practices that may cause cancer.

The Occupational Safety and Health Administration was established to ensure safe and healthful working conditions for working men and women and to provide for research, information, education, and training in the field of occupational safety and health. It relies on the National Institute for Occupational Safety and Health (NIOSH) in the DHEW for research support and recommendations for occupational safety and health standards. Most importantly, the memorandum of agreement stated that:

> The Occupational Safety and Health Administration (OSHA) will develop an Occupational Cancer Information and Alert Program. It will provide for review of scientific information on occupationally related cancer and development of a plan for incorporating that information into an educational program aimed at reducing the incidence of cancer. The Program will include such tasks as establishing and conducting research, technical reviews, and symposia, and producing and distributing films, curriculum materials, training aids and other materials necessary for the attainment of Program objectives.
>
> OSHA will develop, maintain, coordinate and evaluate projects and activities to improve the effectiveness of cancer education carried on through public information activities, professional organizations, industries, and unions.

In September 1974 the Director of the OSHA Office of Training and Education had asked the President of the National Academy of Sciences (NAS) to assist in establishing goals and objectives for the program then under consideration. Ultimately the NAS accepted the task of making recommendations on the general content, the manner of presentation, and the target audience of the Occupational Cancer Information and Alert Program and to plan and conduct a symposium designed to permit the interchange of information concerning the role of information and education in the control of occupation-related cancer. The Committee on Public Information in the Prevention of Occupational Cancer was established within the Assembly of Life Sciences of the National Research Council, and met for the first time on 2 December 1975.

The membership of the Committee was selected to provide, essentially, two main groups of people: one well versed in the hazards of the workplace and familiar with occupational carcinogens and the circumstances of their presence in the industrial environment and with the techniques of controlling exposure to them, and the other concerned with human behavior, the use of information in altering behavior, and the ethical-legal aspects of that use. The inclusion of representatives of labor, management, and government in the membership was considered; but it was concluded that the objectivity of the Committee would be better maintained if it were not established on any such representational basis.

In the course of its 14 meetings, the Committee sought to identify the issues involved, to learn what various groups and individuals had to say about those issues, and to learn what was being done about them. The Committee was afforded the opportunity of having frank discussions with representatives of OSHA, NIOSH, labor unions, management, and physicians involved in the problem of informing employees (Appendix 1).

The Committee made three specific attempts to gain information from the public. The first was an open meeting on 17 February 1976 that was announced in a press release and in the NAS News Report. Some 55 people attended, including representatives of five trade associations, eight manufacturers, two labor unions, the press, and the general public.

In March 1976, a letter was mailed to 30 trade associations and 17 unions presumed to be faced with the problem of carcinogens in the workplace and to 12 public service occupational safety and health groups. It asked for information concerning "(1) the nature of current information programs related to the control of occupation-related cancer, (2) the issues involved in providing information to employers and employees for that purpose, (3) suggestions for approaching those issues, and (4) the nature of any recent research efforts having to do with the concept of risks and evoking appropriate behavior." This appeal resulted in nine responses--six from trade associations, two from unions, and one from a public service group. Of these responses, only two were informative.

A symposium was held 2-3 December 1976. In addition to being released to the press, invitations were mailed to some 160 individuals and groups, including 31 trade associations, nine manufacturers, 22 unions, 18 public service organizations, and eight professional associations. In addition to the 30 invited speakers (Appendix 2), 149 people attended the symposium. The audience included representatives of seven trade associations, 23 manufacturers, three labor unions, 10 public service health organizations, the government, the press, and the general public (3).

The report that follows reflects the information acquired by the Committee in the above activities, discusses the issues that were identified, and makes recommendations for the general content, target audience, and manner of presentation of an information program.

I. SUMMARY AND RECOMMENDATIONS

SUMMARY

The Committee was asked to contribute to the Occupational Cancer Information and Alert Program of the Occupational Safety and Health Administration by recommending the general content, the target audience, and the manner of presentation of information aimed at preventing cancer related to the workplace. We examined the statutory responsibilities of OSHA, the Department of Health, Education, and Welfare, and employers to provide such information to the worker, and found those responsibilities clearly delineated. We accepted without question the fundamental ethical requirement to inform the worker about the presence of a carcinogenic substance in his working environment. We believe that the documentation of increased risk of cancer among employees in a variety of workplaces permits no doubt of the importance of information as a preventive measure. The great number of chemicals in our environment, when coupled with the long latent period of cancer, suggests that the problem may be greater than is now apparent--which makes a public information program imperative.

While the Committee was asked to consider only the subject of occupational cancer, most of its findings and recommendations apply equally to agents responsible for the other two major chronic cell effects, i.e., mutation and birth defects.

The Committee encountered the following problem areas:

- The Definition and Determination of Carcinogenesis

The determination of whether an agent is a human carcinogen is not always absolute. Evidence of the carcinogenicity of an agent is obtained from epidemiologic studies of human populations, from animal experiments, and from in vitro tests. Because the interpretation of the results of such studies in terms of the risk to man is often difficult, it is not easy to decide which substances should be brought to the attention of the worker as carcinogens. Moreover, there is a vast difference between the number of agents suspected of being carcinogens, and the number for which standards have been promulgated. For example, while the National Institute for Occupational Safety and Health has published a list of some 1,500 suspect carcinogens, and issued 12 "Current Intelligence Bulletins" on carcinogens since January 1975, OSHA has, since 1971, promulgated standards for only 16. This situation indicates another difficulty--that in addition to international and non-government organizations, at least three government agencies, OSHA, NIOSH, and the National Cancer Institute (NCI), issue reports on the carcinogenicity of substances. Informing workers about a carcinogen in the workplace requires a commitment of resources, so a decision to inform should be based on carefully evaluated data.

- Public Information Sources and Institutions

The sources of the information ultimately provided the employer and the worker range from those which determine that a substance is a carcinogen to those which explain the risk in specific workplaces. These sources include a variety of agencies, organizations, and individuals. They are perceived by the worker as having different degrees of expertise and credibility.

- Target Audience

The primary audience must be the individual worker who is exposed to the carcinogenic substance, and this implies that his employer also be informed. The accessibility of the audiences varies widely. Large plants engaged in manufacturing chemicals and those employing unionized workers can be identified and seem to offer opportunities for adequate information programs. However, the greater number of workers employed in small and/or non unionized plants are generally much less accessible, as are agricultural workers. Information provided to school children and the families of workers may facilitate the education of both employers and employees.

RECOMMENDATIONS

General Content

Information about the hazard of a carcinogen in the workplace should (1) be sufficient to permit a job applicant to decide if he wants to work there, or an employee to decide whether he wants to continue working there; (2) tell the worker how to take steps to minimize his own exposure; and (3) be sufficient to permit the worker to assist, to the limit of his capability, in monitoring and improving the environment of his workplace.

To permit a broad understanding of the hazard of occupational cancer, the employer and the worker should be presented with the following concepts:

- Many carcinogenic substances can be absorbed by man without any warning signal such as coughing, burning, or nausea.

- If permanent damage is done to a cell by a carcinogenic agent, the defect is passed on to daughter cells in the process of multiplication. The effects of repeated exposure can therefore be additive. Moreover, some agents, such as asbestos, are not readily eliminated from the body, so their concentrations increase with repeated exposure.

- There is usually a latent period of from 5 to 30 or more years between the first absorption of the carcinogen and the appearance of any sign of disease.

- Although there is still some debate within scientific circles, for all practical purposes there is no dose of a carcinogen below which

one can say that there is absolutely no risk of its causing cancer. Nevertheless, decreasing the exposure decreases the risk, and increasing it increases the risk.

- The hazard of a carcinogen is, in some instances, multiplied if it is absorbed in conjunction with other substances, such as cigarette smoke.

- Some carcinogens can be inadvertently transferred from the workplace to the home in significant quantities.

- An indication that a substance may produce cancer in man is frequently found in experiments on laboratory animals and cells. When an agent is demonstrated, in controlled experiments, to produce cancer in animals, that agent should be regarded as possibly carcinogenic in man.

- In some instances, benign tumors develop into cancer; and in many instances agents that produce benign tumors increase the risk of cancer.

* Within a specific workplace, once it has been determined reliably that a substance is or may be carcinogenic, the following information should be provided:

- The identification of the substance in question by the name used in the workplace and, where possible, by its generic name.

- Data on the carcinogenicity of the substance, including evidence from human epidemiologic studies, animal studies, and other valid techniques.

- An interpretation of the risks in the workplace implied by the above data.

- A description of the disease in man, where applicable.

- The route of exposure within the workplace.

- Required and recommended measures to reduce exposure, including containment and disposal measures, monitoring procedures, and individual protective measures.

Target Audience

In order to ensure that all employers are aware of the necessity of informing their employees, OSHA should take steps to:

- See that carcinogenic substances are so identified where appropriate, by generic and trade names--and clearly labeled from point of manufacture to disposal, regardless of the number of intermediate formulations.

- Acquire and maintain an accurate list of commercial enterprises that are potential manufacturers or users of carcinogenic substances.

To enhance the receptiveness of the worker to a specific information program:

- Where appropriate, the immediate community should also be informed, through local health and other authorities, of the hazard.

- The fundamental concept of hazardous substances in the environment should be introduced in primary- and secondary-school curricula.

Manner of Presentation

To ensure the establishment of effective communication with the worker:

- Sources beyond those charged with statutory responsibility should also be involved in informing him. Consideration should be given to labor unions, extension services of the land grant colleges and other adult-education activities; state, county, and municipal health departments; and community-oriented public-service health groups.

For this multiple-source approach to be effective, the information provided by each must be essentially similar.

- A central national source of information should be established, whose output is credible to all and can be used as a common base for the content of all information programs.

Although the matter of when and where information is best presented to the worker cannot be delineated by the Committee, because it can vary with so many circumstances, it is clear that:

- The information program should be initiated at the preemployment interview and should be presented recurrently under a variety of circumstances--regardless of the stability of the work force.

- The presentation of the information should take into account the nature of the specific work force--its size, structure, degree of training, etc.

- OSHA should devote some of its resources to supporting studies designed to identify the best presentation techniques for selected types of workplaces. These studies should have a common data base, to permit a valid comparison of effectiveness.

In spite of the anxiety that is frequently associated with the hazard of cancer:

- Information essential to the understanding of risk by the whole group of employees should not be withheld on the chance that it might cause anxiety in some.

Because of the widely varying nature of specific work forces and of individuals within them:

- The content of the message and the selection of the medium should be based on the characteristics of the target audience.
- A variety of media and methods of presentation should be used to inform an individual work force.

For the worker to be satisfied that he is the subject of a genuine effort to tell him what he needs to know:

- Provision should be made for answering questions that arise from the information that is presented.

II. INTRODUCTION

IMPORTANCE OF THE PROBLEM

It has been estimated that some 80% of all human cancers are caused, or their orgin strongly contributed to, by factors in the environment and therefore are theoretically preventable (6). Although less than 5% have been attributed directly to occupational exposures (1), this may be an underestimate in view of the difficulty in identifying causes. Regardless of the proportion, however, occupational carcinogens constitute a group of environmental factors that, when identified, are subject to specific regulation and engineering controls, which offers the possibility of nearly total prevention of new cases.

A number of tabulations of occupational carcinogens have been made. One of the more recent lists, by Cole and Goldman, is presented in Appendix 3. The figures given for incubation periods and risk ratios are the authors' estimates, based on their interpretation of the literature. As in most summary tables of this sort, no attempt has been made to indicate that in some instances, as with nickel and chromium, only certain compounds, or forms, of the agent have been reported to be carcinogenic.

The importance of preventing occupational cancer is readily apparent when one examines the increased risks of cancer demonstrated in workers exposed to known carcinogens. Beyond this, however, is the conviction that all occupational carcinogens have not been identified. For example, Tomatis (11), in 1975, reported on an International Agency for Research in Cancer program to evaluate the carcinogenic risk of chemicals to man. At that time the chemicals selected for assessment were among those for which there was some evidence or suspicion of carcinogenicy in experimental animals and/or man, and to which human exposure is known to occur. Of the 196 compounds evaluated, carcinogenicity to man, or a strong suspicion thereof, were found for 14 compounds associated with occupation. Of 94 compounds found unquestionably carcinogenic in animals only, 78 are present in some occupational environment. Of 41 found to have "limited" carcinogenic activity in animals, 34 are present in the workplace.

A few historical examples will indicate the crucial importance of, as well as the difficulty of recognizing, the occupational relationship of these long-latent period cancers--in particular, the dilemma of the translation of animal data to man; their social and economic impact; and the need for informing the worker of both the general and the specific hazard. The three examples following are those of a substance long considered an occupational hazard, and now firmly established as a carcinogen; an industrial material only recently confirmed to be carcinogenic in man; and a ubiquitous industrial solvent recently shown, in one study, to produce cancer in mice, but not in rats.

Asbestos, as the source of lung fibrosis, or "asbestosis", has been recognized as a health hazard for over 50 years. It was not until the 1940s that an association between the inhalation of asbestos and lung cancer was supported by epidemiologic evidence. By the early 1960s, the evidence was overwhelming. It was first suggested in 1960 that asbestos was involved in the etiology of malignancies of the mesothelium (the pleura or peritoneum), which is now generally accepted. Epidemiologic data were recently summarized by the International Agency for Research on Cancer.

> In many studies of groups of asbestos workers, for example, approximmately 20% of all deaths are the result of lung cancer, three-quarters of which are attributable to their work with asbestos (8). Among such groups, pleural and peritoneal mesotheliomas have become common; estimates for certain groups suggest that as many as 7-11% may die of these diseases (4), which otherwise occur only rarely. Excess incidences of gastrointestinal, laryngeal and oropharyngeal cancer will claim further lives. There are few accurate estimates of the numbers of persons at risk from exposure to asbestos in the various countries of the world. Attempts to do so have been made in the U. S. (18), and it is sobering to realize that there are now in the U. S. approximately one million men and women who work regularly in manufacturing asbestos products or who were so employed in the past. Should the foregoing estimates hold for them as well, some 200 thousand deaths from lung cancer and 50 or more thousand deaths from mesothelioma will occur (19).

Vinyl chloride, one of the three major ingredients used in making plastics, has been produced on an industrial scale in the United States since 1933, but on a large scale only since the 1950s. In the absence of animal studies to indicate long-term effects, the vinyl chloride monomer was at first regarded as relatively nontoxic. In the late 1960s unusual changes were noted in the hands of workers who cleaned polyvinyl chloride polymerization chambers. Animal investigations ensued and in 1970, through the administration of high concentrations of vinyl chloride monomer to rats by inhalation, it was learned that the chemical produced not only vascular and bone changes, but also cancers. Because the experimental doses were so much higher than those encountered in the workplace, there was no general alarm. By 1973, much lower doses had been linked with a number of tumors in rats, including those of the liver, but no unusual tumors had been reported in exposed workers. However, in late 1973 and early 1974, three cases of liver hemangiosarcoma were discovered in a Louisville plant. Since then, over 50 cases of this rare tumor, in vinyl chloride workers--including 4 more related to the Louisville plant--have been located throughout the world. One mortality study of 257 workers exposed to vinyl chloride for five years or more found that, of the 24 deaths, three were due to hemangiosarcoma of the liver. In that group, nine deaths from all forms of cancer were observed, where only four would be expected (5).

Trichloroethylene is a solvent that is used in degreasing machine parts, in dry-cleaning and extraction processes, and to some extent as an inhalation anesthetic. The annual U. S. production is approximately 234,000 metric tons. It is estimated that some 280,000 industrial workers are exposed occupationally to the chemical. Although known to be a central nervous system depressant at high concentrations and reported to produce some toxic effect on the liver and kidneys, it had been regarded as an industrial chemical of low toxicity. In June 1975, the NCI issued a Carcinogenesis Technical Report (17) indicating that trichloroethylene caused liver cancer, in the one strain of mice tested, when given in large doses by gastric intubation. No tumors were seen in rats similarly tested. This was the first report associating trichloroethylene with cancer in animals, and its relevance to occupational hazard is questioned by some of the scientific community. While there is no evidence at present that the chemical is carcinogenic in man, definitive epidemiologic studies have not, to the Committee's knowledge, been undertaken.

THE LEGAL BASIS

The Committee examined the statutory responsibilities assigned to various government agencies and found relatively few concerning the provision of information to the worker. The pertinent statutory obligations are summarized below.

The Occupational Safety and Health Act of 1970 (15) requires every employer to "furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees; [and to] comply with occupational safety and health standards promulgated under this Act."

The employee is required to "comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to the Act which are applicable to his own actions and conduct," but no penalty for failure to comply is prescribed. The Act recognizes the right of employee representatives to seek information on hazardous substances in the workplace, but assigns them no special responsibilities.

The Act recognizes the necessity of cooperation between employees and management. It states that "employers and employees have separate but dependent responsibilities and rights with respect to achieving safe and healthful working conditions," and it "[encourages] joint labor-management efforts to reduce injuries and disease arising out of employment."

With respect to information, the Act requires that

> Any standard promulgated under this subsection shall prescribe the use of labels or other appropriate forms of warning as are necessary to insure that employees are apprised of all hazards to which they are exposed, relevant symptoms and appropriate emergency treatment, and proper conditions and precautions

of safe use or exposure. Where appropriate, such standard shall also prescribe suitable protective equipment and control or technological procedures to be used in connection with such hazards and shall provide for monitoring or measuring employee exposure at such locations and intervals, and in such manner as may be necessary for the protection of employees.

This charge is reflected in current standards promulgated by the Department of Labor for carcinogens, of which that for vinyl chloride (10) is representative:

> Training. Each employee engaged in vinyl chloride or polyvinyl chloride operations shall be provided training in a program relating to the hazards of vinyl chloride and precautions for its safe use.
>
> (1) The program shall include:
>
> (i) The nature of the health hazard from chronic exposure to vinyl chloride including specifically the carcinogenic hazard;
>
> (ii) The specific nature of operations which could result in exposure to vinyl chloride in excess of the permissible limit and necessary protective steps;
>
> (iii) The purpose for, proper use, and limitations of respiratory protective devices;
>
> (iv) The fire hazard and acute toxicity of vinyl chloride, and the necessary protective steps;
>
> (v) The purpose for, and a description of the monitoring program;
>
> (vi) The purpose for, and a description of, the medical surveillance program;
>
> (vii) Emergency procedures;
>
> (viii) Specific information to aid the employee in recognition of conditions which may result in the release of vinyl chloride; and
>
> (ix) A review of this standard at the employee's first training and indoctrination program, and annually thereafter.

Use for Benzene as well

Both the law and the standards establish a clear requirement for the provision of training to the employee.

The Act places further responsibility for providing public information on toxic substances in the hands of the Secretary of Health, Education, and Welfare, as indicated in the following statement:

> The Secretary of Health, Education, and Welfare shall publish . . . as needed but at least annually a list of all known toxic substances by generic family or other useful grouping, and the concentrations at which such toxicity is known to occur. He shall determine following a written request by any employer or authorized representative of employees, specifying with reasonable particularity the grounds on which the request is made, whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found; and shall submit such determination both to employers and affected employees as soon as possible. If the Secretary of Health, Education, and Welfare determines that any substance is potentially toxic at the concentrations in which it is used or found in a place of employment, and such substance is not covered by an occupational safety or health standard promulgated under Section 6, the Secretary of Health, Education, and Welfare shall immediately submit such determination to the Secretary [of Labor], together with all pertinent criteria.

In addition, the new Toxic Substances Control Act of 1976 (16) empowers the Administrator of the Environmental Protection Agency (EPA) to require testing and development of data on chemical substances and mixtures if it is reasonable to assume that such substances or mixtures might--through manufacturing, distribution, processing, use, or disposal--result in an unreasonable risk of injury to health or to the environment, and if the requisite data are lacking. Testing for carcinogenicity, mutagenicity, and teratogenicity are specifically included within the requirements that the Administrator may mandate under the Act. If the Administrator concludes that a hazard exists, he may take actions ranging from an outright prohibition of manufacture, through a requirement that proper warning labels be placed on the substance, to a requirement that records of processing, testing, or use be maintained. The Committee cannot yet determine the influence of the Act with respect to public information on occupational carcinogens.

Current laws, as administered by OSHA and DHEW, clearly contain a legal basis for providing public information for the prevention of occupational cancer.

THE ETHICAL BASIS

Early in its deliberations, the Committee agreed that there is a fundamental ethical principle that may best be called the "right to know." We believe that the readiness with which we accepted this principle parallels the increasing concern of society as a whole with the individual's right of self-determination.

The Committee believes it unethical and unrealistic to assume that the right to know requires employers to inform workers about only the few chemicals that nearly everyone agrees are human carcinogens. It also believes it unethical and unrealistic to argue that the right to know requires employers merely to make summary information about the exposure of workers to suspected carcinogens available for inspection. Therefore, the Committee finds it necessary for government agencies and employers to make a reasonable effort to ensure that workers comprehend the relevant information. They should devote appropriate time and resources to gathering, interpreting, and explaining that information.

The Committee suggests that the employee's right of self-determination shapes the boundaries of the employer's duty to reveal information. The employee must possess enough information to enable an intelligent choice. Thus, the ethical test for whether particular information must be divulged is its relevance to the employee's decision. All risks potentially affecting the decision must be unmasked (7).

III. PROBLEM AREAS

DEFINITION AND DETERMINATION OF CARCINOGENESIS

A carcinogen is something that causes cancer. Beyond that, the definition becomes complex. NIOSH has published a list of some 1,500 substances that have been rendered suspect by virtue of reports that they have produced mutagenesis, teratogenesis, or carcinogenesis in biologic systems ranging from cell cultures to man. The evidence on which this list is based varies widely in scientific accuracy and credibility. Moreover, the list does not cite negative results obtained in similar investigations. In contrast, OSHA has issued standards on only 16 carcinogens.

Some General Considerations

A carcinogen may be generally defined as any physical, chemical, or biologic agent (including hormones) or combination of agents that produces cancer in an organism. Physical agents include ionizing radiation (such as x rays), nonionizing radiation (such as ultraviolet light), and particles (such as asbestos); chemical agents include such compounds as calcium chromate and benzidine and complex mixtures, such as those in cigarette smoke; and biologic agents include viruses and parasites. Because each of these types of agents can be found in an occupational setting, it is generally difficult to ascribe a specific case of cancer to any one of them. One usually cannot tell the cause of an individual case of human cancer. A case of lung cancer due to cigarette smoking may be identical with one due to an occupational exposure. There are some types of tumor of which the cause can be strongly suspected, such as mesothelioma caused by asbestos and angiosarcoma of the liver caused by vinyl chloride, but these are the exceptions. That a case of cancer occurs in someone exposed to a carcinogen does not prove that it was caused by that exposure. The probability of an association increases with the known potency of the carcinogen, the degree and duration of exposure, and the length of time since exposure began.

The concept of a carcinogenic agent or substance must take into consideration the following factors:

1. Latency period: Some time elapses between the exposure of an organism to a carcinogenic agent and the development of cancer. In man, latency periods may vary from 5 to 30 or years or even more, and there is evidence that the period decreases with increased exposure.

2. Metabolism of chemical agents: A chemical agent to which an organism is exposed may not be in the form that actually produces the cancer--the ultimate carcinogenic agent. When a chemical is introduced

into an organism, it is usually metabolized; the ultimate carcinogen that finally produces the cancerous change may be the end result of a series of metabolic changes. The metabolism of a compound is not always the same in man and other animals.

3. Dose-response relationship: Available data indicate that, as the dose or duration of an exposure to a carcinogenic agent increases, the probability of developing cancer increases. Although, theoretically, there is no dosage below which a carcinogenic agent cannot produce cancer, it can be shown that decreasing the exposure decreases the risk and that increasing the exposure increases the risk. Whether small risks are acceptable is a matter for evaluation by working people, industry, and society at large--as well as by scientists (9).

4. Benign tumors: It is not always possible to make a sharp distinction between benign tumors and malignant tumors (cancer). In some instances, benign tumors develop into cancer.

5. Cocarcinogenesis: Some agents may not produce cancer by themselves, but only if followed by exposure to another agent (which also does not produce cancer by itself). Thus, a sequential series of exposures to different agents may be necessary for some types of cancer to develop.

6. Susceptibility: Individuals may vary in their susceptibility or response to a carcinogenic substance. Currently, there are no reliable methods by which to determine individual susceptibility.

Methods of Determining Whether an Agent is a Carcinogen

1. Epidemiologic studies in human populations: When properly controlled epidemiologic studies (retrospective or prospective) in a human population group indicate that exposure to an agent increases the risk of cancer, it is generally accepted that the agent is carcinogenic. The carcinogenicity of chemicals in man has usually been determined from epidemiologic studies of exposed occupational groups. Negative epidemiologic data may not establish the noncarcinogenicity of suspected agents because in a particular situation under study the sample may be too small or the exposure too brief or too small to produce an effect.

A major problem encountered in epidemiologic studies results from the long latent period (e.g., 5-30 years) common for cancer. In addition, because of this length of time, it is difficult or impossible to determine retrospectively the agent involved, let alone the dose or duration of exposure, and to ascertain accurately the extent of personal habits, such as cigarette smoking, that are related to some forms of cancer.

2. Experimental animal studies: The carcinogenicity of an agent can be established when administration to animals in adequately designed and conducted experiments results in an increased incidence of one or more types of cancer. Such increases are regarded with greater confidence if

positive results are observed in more than one group and species of animals or by different investigators. Evidence of carcinogenicity is strengthened if there is a dose-response relationship, i.e., if the incidence of cancer is increased with an increased dose of the agent being tested.

Extrapolation from animal studies for evaluating human risks entails large uncertainties. Each situation must be individually evaluated, with consideration of such factors as adequacy of experimental design, statistical significance of the data, dose-response relationships, duration of exposure, route of administration, metabolism (including species variations), host susceptibility, cofactors and other modifying factors, and the dose of the agent to which humans are or will be exposed.

A negative result obtained in a particular animal experiment does not preclude the potential carcinogenicity of a compound in humans: an inappropriate experimental species may have been chosen, too few animals may have been tested or the period of observation may have been too short. Alternatively, test conditions may have been inappropriate, with respect to their predictive value for the response of humans. Extrapolation of experimental carcinogenicity data to the human situation is strengthened by obtaining results in more than one species. However, negative results obtained in one species do not detract from the significance of clearly positive results obtained in another species.

3. Short-term in vitro tests: Two major practical limitations in using animal experiments for determining potential human carcinogenesis are the large number of animals required and the long time (several years) that are necessary to obtain results. Consequently, a number of short-term in vitro tests have been developed, with promising results. Most of these actually measure mutagenic effects, rather than carcinogenesis. The bacterial mutagen test developed by Ames and coworkers has been studied most extensively. Test results are usually obtained in 2 days. Comparison of results of this test with results of animal studies have indicated that 85% of chemicals that are definitely carcinogenic (as previously determined by animal studies) were positive mutagens by this test, as compared with about 8% of non-carcinogenic substances that had chemical structures similar to those of the carcinogens (2). These findings, combined with other available data, indicated that the Ames in vitro test system is a useful screening device for chemicals.

The intelligent application and interpretation of in vitro tests must also take into account species variations in metabolism, macromolecular repair, and host defense mechanisms. A number of approaches addressed to the metabolic aspects are now available, including "host-mediated" mutagenesis assays, the assay of urine and other biologic fluids taken from animals or humans receiving the test compound, the addition of microsomal enzymes and cofactors to the test system, and the use of specific types of cells in the test. Some laboratories are actively engaged in the development of new tests and in the improvement of others.

None of the short-term tests can be used today to establish, beyond refutation, whether a compound will be carcinogenic in man or in experimental

animals. Positive results obtained in these systems suggest extensive testing in long-term animal bioassays, particularly if there are other reasons for concern. Negative results in a short-term test, however, do not establish safety.

Who Makes the Determination?

Those who seek to inform the worker of the hazard of a carcinogen in the workplace--be they employers, labor unions, or public service groups--have difficulty finding clear evidence that there is indeed a hazard. Statements, of varying credibility, are received from a wide range of sources--the federal government, the scientific literature, the news media. In the government, the somewhat ponderous procedures imposed by the statutes under which OSHA operates result in credible information on only a few carcinogens. NIOSH makes announcements that do not become directives in nature until they are ratified by OSHA, as is the case with the "alerts" promulgated by the NCI. Under the Toxic Substances Control Act, the EPA will no doubt be added to the sources of information about the carcinogenicity of chemicals in the workplace. The scientific literature abounds with papers that attribute some degree of carcinogenicity to a chemical under circumscribed investigative circumstances, whose evaluation often taxes even the scientific community, let alone the layman. The news media, on occasion, have given credence to such papers or extrapolated their findings to a degree that the scientist finds questionable.

The decision to inform those in affected workplaces of the hazard of a chemical is not to be taken lightly, as it involves the commitment of substantial resources. For that reason we believe it essential that a single national source, such as DHEW, be charged with making the decision that workers are at risk. This source should be, to the extent possible, credible to both management and labor; therefore, it should not be involved in the regulatory process. But, it must not be so remote from the realities of the workplace that it cannot make an appropriate assessment of risk, or at least announce its decision in a form that can be translated to a specific occupational situation.

PUBLIC INFORMATION SOURCES AND INSTITUTIONS

The worker is exposed to various kinds of information about the workplace from many different sources. Those sources, both individual and institutional, are perceived as having various degrees of expertise and credibility. They include trained industrial hygienists, family physicians, shop stewards, local newspaper columnists, cousins, wives, and fellow workers. The public information task ranges from the initial determination that a substance is a carcinogen to the publication of the information important to the individual worker, and the sources of such information include a variety of institutions and individuals that perform different parts of the task.

OSHA offically promulgates the type of information that must be presented to an employee working with an established carcinogen, and requires that the material used in so informing him be submitted for review on request. The individual industrial hygienists working for OSHA, in their compliance surveys, also have an opportunity to inform workers. In addition to industrial hygienists employed by OSHA, the agency funds a number of training contracts, including those with land grant colleges, certain unions, and other organizations (Appendix 4).

The principal arm of the Secretary of HEW in the execution of his responsibilities under the Occupational Safety and Health Act is NIOSH. NIOSH publishes and distributes two series of educational pamphlets related to the hazard of the workplace--one directed at the employer, and the other directed at the worker. None of the current series of documents,however, addresses the hazard of carcinogenesis; rather, they are more concerned with accidents and acute toxic effects. There also appears to be no mechanism by which to ensure the distribution of appropriate documents to all places of employment.

Management and labor both play a role in presenting information to the worker and other relevant audiences. However, it is not known which source is more effective or more credible.

Although there are clearly a number of "official" sources of information available to the worker, unofficial sources may be more influential in actually modifying a worker's decision and behavior with respect to the workplace. The Committee could identify no data with respect to the effectiveness or credibility of various sources of information. The Committee did hear testimony suggesting that not all sources were equally effective with any given group of workers and that multiple sources and institutions must be used to transmit messages to the worker.

TARGET AUDIENCE

The primary audience for any public information program must be made up of the individual workers who are or may be exposed to carcinogenic agents. This implies that their employers must also be informed. Determining and isolating the target audience, however, are not easy, because it consists of many divergent groups.

Perhaps the most readily identifiable target audience is the unionized workers employed in a large plant that is engaged directly in the manufacture of a chemical determined to be carcinogenic. For example, in 1973, 18,258 people were engaged in manufacturing asbestos products in 129 plants, of which 46% employed more than 50 workers each (12). Such a target audience is not only readily identifiable, but suggests an organization within which an effective information program could be mounted.

A far more difficult audience to identify and reach consists of workers employed in nonunion plants and plants that employ few workers. In 1974,

at least 75% of the nonagricultural work force was not affiliated with labor unions (13). As an example of the size problem, the construction industry in 1973 employed almost 600,000 people who might be exposed to asbestos in their working environment; they were distributed throughout about 70,500 establishments, only 2% of which employed more than 50 workers each. [51% of these establishments employed fewer than four workers each (14)].

The most difficult audience to reach consists of farmers and other workers engaged in farming activities. This population is engaged in handling chemicals that may be carcinogenic. Finding an organizational structure to reach such groups is difficult, particularly when the large number of migrant workers is considered.

Although workers are, and must remain, the primary target audience for public information programs, other audiences are important. The families of workers may be able to play an important part in determining a group's behavior. Programs designed to reach the families thus deserve considerable attention. But the Committee has identified few attempts to provide educational materials to the families of workers at risk.

Finally, an important audience consists of that large body of young people who have not yet entered the workforce, i.e., children in elementary and secondary school. The Committee heard testimony suggesting that reaching such audiences, perhaps through the schools, could produce lasting habits of caution in the workplace.

IV. INFORMING THE WORK FORCE AND THE PUBLIC

The critical elements of any public information effort are the content of the message, selection of the target audience, the choice of the most effective means of transmitting that message, and the determination of its effect. The preceding discussion has indicated the clear need for providing information to the worker and some of the problems involved in doing so. What follows are the Committee's suggestions of broad guidelines within which the task can best be accomplished.

CONTENT

Information about the hazard of a carcinogen should (1) be sufficient to permit a job applicant to decide if he wants to work there, or an employee to decide whether he wants to continue working there; (2) tell the worker how to take steps to minimize his own exposure; and (3) be sufficient to permit the worker to assist, to the limit of his capability, in monitoring and improving the environment of his workplace.

Whatever the nature of the information required to meet these criteria for a specific workplace, the worker must be able to obtain the generic names as well as the trade names of carcinogenic agents. It is often difficult, if not impossible, to locate information on chemicals that are identified only by trade names or industrial codes.

To permit the employer and the worker to understand the hazard of occupational cancer, they should be presented with the following concepts:

Many carcinogenic substances can be absorbed by man without any warning signal such as coughing, burning, or nausea.

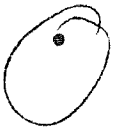
If permanent damage is done to cell material by a carcinogenic agent, the defect is passed on to daughter cells in the process of multiplication. The effects of repeated exposure can therefore be additive. Moreover, some agents, such as asbestos, are not readily eliminated from the body, so their concentrations increase with repeated exposure.

It is typical of a chemically induced cancer that it may be 5-30 years, or even more, after the first absorption of the carcinogen that any sign of disease appears.

Although there is still some debate within scientific circles, for all practical purposes there is no dose of a carcinogen below which one can say that there is absolutely no risk of its causing cancer. Nevertheless, decreasing the exposure decreases the risk, and increasing it increases the risk.

The hazard of a carcinogen is, in some instances, multiplied if it is absorbed in conjunction with other substances, such as cigarette smoke.

Some carcinogens can be inadvertently transferred from the workplace to the home in significant quantities.



An indication that a substance may produce cancer in man is frequently found in experiments on laboratory animals and cells. When an agent is demonstrated, in controlled experiments, to produce cancer in animals, that agent should be regarded as possibly carcinogenic in man.

In some instances, benign tumors develop into cancer; and in many instances agents that produce benign tumors increase the risk of cancer.

The information provided to the employer and to the worker in the specific workplace should include the following elements:

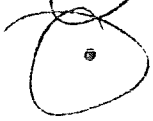
The identification of the substance in question by the name used in the workplace and, where possible, by its generic name.

- Data on the carcinogenicity of the substance, including evidence from human epidemiologic studies, animal studies, and other valid techniques, expressed in understandable terms that permit comparison with other hazards of life.

An interpretation of the risks in the workplace implied by the above data.

A description of the disease in man, where applicable.

The route of exposure within the workplace.



Required and recommended measures to prevent exposure, including containment and disposal measures, monitoring procedures, and individual protective measures.

TARGET AUDIENCE

The ultimate target of an information program on occupational cancer is, of course, the exposed worker. There are other elements of the population, that, if properly informed, can facilitate the education of the worker. And there is one, the employer, who is essential to the information process.

One tends to assume that employers are aware of the hazards to which they are subjecting their workers, and that they need only be told to share their knowledge with the workers. These circumstances do not prevail widely. It is apparent that many employers--particularly those using

chemical products, rather than manufacturing them--are not aware of the hazards. This may result from a lack of appropriate concern or from a lack of knowledge of the chemicals in use in the plant. Many chemicals are sold by trade names. They may be incorporated in products by other manufacturers who sell those products to people who in turn use them in their own formulations. In this process, the identity of a hazardous ingredient is frequently lost; if the original manufacturer was aware of its hazard, his knowledge may not be passed on through the distribution system. If an employer at the end of the distribution system is to be held responsible for informing his employees, it is essential to require that the hazardous agent, at each stage, be clearly labeled by its generic and trade names and further identified as hazardous. OSHA, to meet its regulatory responsibility, must have some means of identifying workplaces in which a given agent may be found. Only then will it be possible to ensure that all employers are aware of the hazard and the necessity of informing their employees. The Committee believes that some consideration of a standardized biohazard label, perhaps color coded, is warranted.

The reception afforded an information program by the worker and his response thereto will be enhanced if the community and particularly his family and friends share an understanding of the hazard. Informing the community also may have the effect of raising the sensitivity of local employers to hazards of the workplace.

Beyond these efforts oriented to specific workplaces, however, the Committee believes that there is a need to educate the general public with respect to the broad problem of man-made hazards of the environment. The goal should be to develop a general understanding of the potential effects of some carcinogenic agents and a wariness that will be automatically invoked each time a housewife purchases a cleaning product or a home handyman starts to use a solvent. The target audience for this program is not only the adult population, but also the children in elementary and secondary schools, for it is important to instill these fundamental concepts during the early years. The Committee also believes that general material relating to carcinogens and similar occupational hazards, presented in high school science courses, would be timely for those preparing to enter the work force. An educational program of this scope appears to be well within the combined responsibilities of OSHA, DHEW, and EPA.

MANNER OF PRESENTATION

The Committee believes that, if communication is to be established with the worker, he must be given information when he is receptive and ready to communicate. Furthermore, the more frequently the message is sent, and the greater the number of public information sources and institutions, the better the chance of establishing communication. The Committee believes strongly that sources in addition to OSHA, NIOSH, and employers, should be used. Supplemental sources that offer promise include labor unions; extension services of the land grant colleges and other adult education activities; state, county, and municipal health departments; and community oriented public-service health groups.

The potential of this multiple-source approach will be enhanced if the information provided by each is essentially similar. This emphasizes the need for a central, national, source of information whose output is credible to all and can be used as a common base for the content of all information programs.

The Committee was not able to gain a clear sense of when and where information concerning an occupational carcinogen is best presented. Certainly, it should be initiated at the preemployment interview. Thereafter, the information should be presented recurrently, under a variety of circumstances. Regardless of the stability of the specific work force, the requirement to inform must be viewed as a continuing one. The circumstances under which information is most effectively presented depend to a great extent on the nature of the specific work force and its size and structure. OSHA could profitably devote more of its resources to supporting careful studies designed to identify the best techniques for selected types of workplaces.

Important

There are some who believe that a full disclosure and continuing emphasis of the hazard of a carcinogen in the workplace may provoke a state of anxiety in some employees that is detrimental to their productivity and to their well-being. There is no question that the term "cancer" has a frightening connotation. Nevertheless, information essential to the understanding of risk by the whole group of employees should not be withheld on the chance that it might cause anxiety in some.

The Committee believes that a variety of media should be used. Those who do not read a pamphlet may accept a film; others may accept a closed-circuit television presentation; and there are those who can be effectively reached only through a small group discussion. It is essential, however, that the medium not be the basis of the program. The message should not be made to fit the medium. The content of the message and the selection of the medium should be based on the characteristics of the target audience.

It is not sufficient to give the worker a package of information in a pamphlet, a film, or a lecture. The Committee believes that provision must also be made for the worker to acquire more information than is provided by the package. He must be assured that his questions will be answered--if not during the information session, then by telephone, letter, or consultation with a member of the industrial health staff or someone equally knowledgeable later. A genuine effort should be made to tell him what he needs to know, rather than limit it to a pro forma attempt to meet regulatory requirements. It is likely that worker-management committees, or worker safety representatives (such as those recently instituted in Sweden) in the plant would facilitate this effort.

The Committee found it difficult to evaluate the effectiveness of the various employee information programs that were brought to its attention. In most instances, those responsible for the program had made no formal effort to collect indicators of effectiveness. With respect to programs related to occupational cancer, it is obviously not feasible to wait for

data on the incidence of cancer to see whether the program was effective. But this field seems to pose a sufficient challenge to warrant a careful evaluation of each type of program so that one may eventually determine, with some assurance, which types are effective. Measurements can be made of what is learned from a program, what changes in attitude and behavior or in organizational structure have occurred, and what effects the program has had on the employer, other workers in the plant, or workers' families. Programs that are funded by a single source should have a common data base to permit a valid comparison of effectiveness. If they are funded by several sources, the efforts require coordination.

APPENDIX 1

ACKNOWLEDGEMENT

The Committee is grateful to those who were kind enough to meet with it and provide information or contribute their views on the issues:

Mr. Henry L. Adam
Safety and Fire Protection Division
E. I. duPont deNemours and Co.
Wilmington, Deleware

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National Institute for Occupational Safety and Health

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Manufacturing Chemists Association

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National Cancer Institute

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APPENDIX 1 - continued

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AFL-CIO Industrial Union Department

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University of Louisville School
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Dow Chemical Company
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Director, Labor Occupational Health
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Institute of Industrial Relations
University of California, Berkeley

Dr. Robert L. Woolridge
Division of Cancer Research Resources
and Centers
National Cancer Institute

APPENDIX 2

SYMPOSIUM ON PUBLIC INFORMATION
IN THE
PREVENTION OF OCCUPATIONAL CANCER

National Academy of Sciences Auditorium
2101 C Street, N. W.
Washington, D. C.

THURSDAY, DECEMBER 2

A.M.

8:30 Registration

9:00 Introduction

Charles R. Shaw
Professor of Biology, University of Texas
M. D. Anderson Hospital and Tumor Institute

9:15 OCCUPATIONAL CANCER - HISTORICAL PERSPECTIVE

Norton Nelson
Professor and Chairman, Department of Environmental Medicine
New York University Medical Center

9:30 CANCER IN THE WORK FORCE TODAY

Joseph K. Wagoner
Chief, Industrywide Studies Branch
National Institute of Occupational Safety and Health

9:45 INFORMING THE WORKER - AN ASSESSMENT

Lorin E. Kerr
Director, Department of Occupational Health
United Mine Workers of America

10:00 Break

APPENDIX 2 - continued

10:15 WHAT IS A CARCINOGEN?

Moderator: Anna M. Baetjer
Emeritus Professor of Environmental Medicine
The Johns Hopkins University School of Hygiene and Public Health

Umberto Saffiotti
Chief, Experimental Pathology Branch
Division of Cancer Cause and Prevention
National Cancer Institute

Benjamin L. Van Duuren
Professor of Environmental Medicine
New York University Medical Center

Roy E. Albert
Professor of Environmental Medicine
New York University Medical Center

Irving J. Selikoff*
Director, Environmental Sciences Laboratory
Mt. Sinai School of Medicine

Robert E. Eckardt
Director, Research and Environmental Health Division
Exxon Corporation

11:45 Discussion

P.M.

1:00 Lunch

2:00 THE RIGHT TO KNOW

Moderator: Philip Reilly
Program in Law, Science, and Medicine
Yale Law School

---

*Unable to attend

APPENDIX 2 - continued

Joseph Fletcher
Professor of Biomedical Ethics
School of Medicine
University of Virginia

Angela Holder
Executive Director, Program in Law, Science and Medicine
Yale Law School

Andrea M. Hricko
Health Coordinator
Labor Occupational Health Program
University of California, Berkeley

Paul Kotin
Senior Vice President, Health, Safety, and Environment
Johns-Manville Corporation

David H. Wegman
Assistant Professor, Occupational Health
Harvard School of Public Health

3:30-4:30 Discussion

8:00-9:30 Open Discussion

Moderator: Paul B. Cornely
Professor Emeritus
Howard University College of Medicine

Moderator: Philip Reilly
Program in Law, Science and Medicine
Yale Law School

FRIDAY, DECEMBER 3

A.M.

8:30 EDUCATIONAL PROGRAMS

Moderator: Ervin Bettinghaus
Dean, College of Communication Arts and Sciences
Michigan State University

APPENDIX 2 - continued

Brenda Dervin
Assistant Professor of Communications
University of Washington

Lionel C. Barrow*
Dean, School of Communications
Howard University

Herbert W. Simons
Professor of Speech
Temple University

Richard Ginnold
Assistant Professor of Labor Education
Extension School for Workers
University of Wisconsin

George M. Beal
Charles S. Curtiss Distinguished Professor
Department of Sociology
Iowa State University

Nicholas J. Vianna
Director, Bureau of Occupational and Chronic Disease Research
New York State Health Department

10:15 Break

10:30 Discussion

11:00 HOW TO INFORM THE NONUNION AND SMALL PLANT WORKER

Moderator: Paul A. Brodeur, Jr.
Staff Writer
The New Yorker Magazine

Sheldon Samuels
Director, Health, Safety, and Environment
AFL-CIO Industrial Union Department

*Unable to attend

APPENDIX 2 - continued

Richard Marco
President, UAW Local 588
Chicago Area Committee on Occupational Safety and Health

James Dahlgren
Director, Ambulatory Care
Cedars-Sinai Medical Center
Los Angeles

Paul Witt
Teacher
The Oakwood School
North Hollywood, California

P.M.

12:15 Discussion

1:00 Lunch

2:00 THE EFFECTS OF AN INFORMED WORK FORCE

Moderator: W. Clark Cooper
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APPENDIX 2 - continued

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Pennsylvania State University

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Director of Industrial Medicine
United States Steel Corporation

Andrew Kalmykow
Consultant
American Insurance Association

3:45-4:40 Discussion

APPENDIX 3

Classification of Occupational Carcinogens*

A. Organic agents

1. Aromatic hydrocarbons

Agents	Affected organ(s)	Incubation period (years)	Risk ratio	Occupation
Coal soot Coal tar Other products of coal combustion	Lung, larynx, skin, scrotum, urinary bladder	9-23	2-6	Gashouse workers, stokers, and producers; asphalt, coal tar, and pitch workers; coke-oven workers; miners; still cleaners; chimney sweeps
Petroleum Petroleum coke Wax Creosote Anthracene Paraffin Shale Mineral oils	Nasal cavity, larynx, lung, skin, scrotum	12-30	2-4	Contact with lubricating, cooling, paraffin or wax fuel oils, or coke; rubber fillers; retortmen; textile weavers; diesel jet testers
Benzene	Bone marrow (leukemia)	6-14	2-3	Explosives, benzene, or rubber cement workers; distillers; dye users; painters; shoemakers
Auramine Benzidine α-naphthylamine β-naphthylamine Magenta 4-aminodiphenyl 4-nitrodiphenyl	Urinary bladder	13-30	2-90	Dyestuffs manufacturers and users; rubber workers (pressman, filtermen, laborers); textile dyers; paint manufacturers

2. Alkylating agents

Mustard gas	Larynx, lung trachea, bronchi	10-25	2-36	Mustard gas workers

Appendix 3 - continued

Agents	Affected organ(s)	Incubation period (years)	Risk ratio	Occupation
3. Others				
Isopropyl oil	Nasal cavity	10+	21	Producers
Vinyl chloride	Liver (angiosarcoma), brain	20-30	200 (liver) 4 (brain)	Plastic workers
Bis(chloromethyl) ether Chloromethyl methyl ether	Lung (oat cell carcinoma)	5+	7-45	Chemical workers
B. Inorganic agents				
1. Metals				
Arsenic	Skin, lung, liver	10+	3-8	Miners; smelters; insecticide makers and sprayers; tanners; chemical workers; oil refiners; vintners
Chromium	Nasal cavity and sinuses, lung, larynx	15-25	3-40	Producers, processors, and users; acetylene and aniline workers; bleachers; glass, pottery and linoleum workers; battery makers
Iron oxide	Lung, larynx	-	2-5	Iron ore (hematite) miners; metal grinders and polishers; silver finishers; iron foundry workers
Nickel	Nasal sinuses, lung	3-30	5-10 (lung) 100+(nasal sinuses)	Nickel smelters, mixers, and roasters; electrolysis workers
2. Fibers				
Asbestos	Lung, pleural and peritoneal mesothelioma	4-50	1.5-12	Miners; millers; textile, insulation, and shipyard

Appendix 3 - continued

Agents	Affected organ(s)	Incubation period (years)	Risk ratio	Occupation
3. Dusts				
Wood	Nasal cavity and sinuses	30-40	-	Woodworkers
Leather	Nasal cavity and sinuses, urinary bladder	40-50	50 (nasal sinuses) 2.5 (bladder)	Leather and shoe workers
C. Physical agents				
1. Nonionizing radiation				
Ultraviolet rays	Skin	varies with skin pigment and texture	-	Farmers; sailors
2. Ionizing radiation				
X-rays	Skin, bone marrow (leukemia)	10-25	3-9	Radiologists; medical personnel
Uranium Radon Radium Mesothorium	Skin, lung, bone, bone marrow (leukemia)	10-15	3-10	Radiologists; miners; radium dial painters; radium chemists
3. Other				
Hypoxia	Bone	-	-	Caisson workers

*From: Cole, P. and M. B. Goldman, in Persons at High Risk of Cancer, J. F. Fraumeni, Jr., ed. (Academic Press Inc., New York), 1975, pp. 167-184. (The references appearing in the original have been omitted.)

APPENDIX 4

OSHA TRAINING CONTRACTS FY 76

TRAINEES	NUMBER	LENGTH	CONTRACTOR
Shipyard workers	1,000	24 hr	National Fire Protection Association
Employee representatives	480	30 hr	University of Wisconsin School for Workers
Employee representatives	30	1 wk	University of Wisconsin School for Workers
Union officers and members	800	12 hr	University of Wisconsin School for Workers
Union staff	—	1 wk	University of Wisconsin School for Workers
Employee representatives	900	2-12 hr	University of Wisconsin School for Workers
Employers and employees	43,350	8-12 hr	American Association of Community and Junior Colleges (30 colleges)
Employers and employees (agricultural)	Materials		Purdue Research Foundation
Employers and employees	Pilot film		George Washington University
Employers and employees	Level of knowledge		Southwest Research Institute
Labor and management representatives	200	4 wk	AFL-CIO Building and Construction Trades Department
Employers and employees (longshoring)	--	30 hr	Westinghouse Electric Corporation
Small businesses	200		American Industrial Hygiene Association
Employers and employees	5,000	8-12 hr	American Industrial Hygiene Association
Employees	4,000	40 hr	Ohio State University Labor Education and Research Service

APPENDIX 4 - continued

TRAINEES	NUMBER	LENGTH	CONTRACTOR
Apprentices	—	40-48 hr	University of California Institute of Industrial Relations
Integrate OSHA training with occupational training provided under CETA*			Texas Department of Community Affairs
Develop instruments for testing effectiveness of OSH courses taught at OSHA Training Institute			American Institutes for Research

*Comprehensive Employment and Training Act of 1973.

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#3

KSNA

the voice of Nursing in Kansas

Statement of the Kansas State Nurses' Association
by Lynelle King, R.N., M.S., Executive Director
Before the House Labor and Industry Committee
February 14, 1984
In Support of HB 2770 Information for Employees
Concerning Toxic Substances

Mr. Chairman and members of the committee, my name is Lynelle King and I am the Executive Director of the Kansas State Nurses' Association, the professional organization for registered nurses in Kansas (a constituent of the 165,000 member American Nurses' Association).

KSNA asks your support of this bill which would give employees including nurses the right to have information about health hazards in the workplace. Many commonly used substances are now being documented as potentially toxic. For example, ethylene oxide is a gas used in sterilizing equipment, which is known to have carcinogenic properties but for which no maximum exposure levels exist.

The American Nurses' Association at its 1982 convention passed a resolution regarding Health Hazards in the Workplace. The resolution recognizes that nurses have dedicated their careers to promoting the health and welfare of their clients to the extent that their own health and welfare has been neglected. Nurses in hospitals are among health care workers who frequently face routine exposure to toxic chemicals, gases, radiation and other hazards that have been shown to cause cancer, acute and chronic illness, spontaneous abortion and birth defects. Documentation for planning preventive and corrective action regarding health hazards is often inadequate. The ANA resolved to assist nurses to identify and to report health hazards to appropriate government, health, and nursing agencies or associations; to encourage research and investigative activities into occupational risks and health hazards encountered by nurses in the workplace; and to encourage responsible individuals in health care settings

Atch. 3

to employ qualified nurses to identify health hazards, to help prevent health hazards, to assess consequences of health hazards, and to promote high level wellness of their employees.

KSNA supports HB 2770 because it would strengthen nursing's ability to identify hazardous substances in the workplace and to provide education regarding the prevention of exposure to hazards as well as the consequences of such exposure. Not only would nurses and other health care providers benefit, but nurses working in industrial and other occupational health settings could assist workers in knowing about hazardous substances.