



Appropriations

HOUSE VOTES TO LIMIT ENFORCEMENT OF OSHA, PROVIDE ON-SITE CONSULTATION

A ban on Occupational Safety and Health Administration inspections of firms with fewer than 25 employees and a provision allowing up to \$5 million for states to provide on-site consultation were approved by the House June 27 during floor debate on the appropriations bill (HR 15580) for the Departments of Labor and Health, Education, and Welfare.

Funds for occupational safety and health were approved as recommended by the House Appropriations Committee (Current Report, June 27, p. 83) - \$100,816,000 for OSHA, \$31,986,000 for the National Institute for Occupational Safety and Health, and \$5,512,000 for the Occupational Safety and Health Review Commission.

An amendment, by Congressman Steven D. Symms (R-Idaho) to reduce OSHA funds to last year's level of \$70.4 million, was rejected by a vote of 179 to 218. Another amendment, by Congressman John N. Happy Camp (R-Okla), to delete all funds for OSHA was rejected by a vote of 97 to 295.

A ban on OSHA enforcement in small businesses, which prohibits the use of any funds to pay the salaries of OSHA inspectors inspecting firms with fewer than 25 employees was agreed to by a vote of 201 to 194. The effect of the amendment, which was offered by Congressman Paul Findley (R-Ill), will be to exempt 90 percent of all establishments and 30 percent of all employees from OSHA coverage.

Congressman William A Steiger's (R-Wis) attempt to obtain funds for states to provide on-site consultation was only partially successful. Steiger attempted to add \$5 million to the bill for consultation and had the support of the Secretary of Labor, the National Association of Manufacturers, the American Retail Federation, the Menswear Retailers of America, and the National Small Business Association. Subsequent amendments specified that the \$5 million must come from the \$100.8 million OSHA appropriations.

A similar 25-employee limit, also urged by Findley, was voted by the House last year only to be limited by the Senate and during conference to 15 and ultimately dropped with the President's veto of the Labor-HEW money bill.

The bill now goes to the Senate, where appropriations hearings are in progress.

Health Hazards

SPI "CRASH" EXPOSURE STUDY SHOWS SUPPORT FOR INDUSTRY POSITION ON VC

Data from a "crash" study of worker exposure to vinyl chloride in 36 plants of 20 producing companies failed to support the need for the "no detectable level" standard

proposed by the Occupational Safety and Health Administration, Dr. Carl U. Demehl, associate medical director, Union Carbide, said during OSHA hearings on June 26-28.

The OSHA hearings on a standard for vinyl chloride (VC) continued from June 24 to 29 (Current Report, June 27, p. 83), and will resume July 8.

Advancing the position of the Society of the Plastics Industry, Inc., Dernehl said examinations of the men studied "have failed to show the existence of abnormal liver function tests in greater proportion than would be found in a control population."

The study was conducted in the last few weeks prior to the beginning of the public hearings on June 25 and was done in preparation for the industry's testimony. Some 3,843 persons were involved. Of these, 787 had more than 10 years exposure. Of the total, 1,402 workers had a significant time lapse since first exposure, some 104 being exposed longer than 20 years, and 416 workers having had 20 years time lapse from first exposure to the present, Dernehl said.

He noted plants where cases of angiosarcoma of the liver were found were, obviously, excluded from the study (South Charleston, S.C., Louisville, Ky., Pottstown, Pa., and Niagara Falls, N.Y.) as were plants with less than 10 years exposure. Sufficient exposure in terms of time and levels, up to at least 250 ppm, were characteristic of these men, Dernehl said. Some 416 men had been exposed for the recognized latent period of 20 years.

There is no case of angiosarcoma of the liver among these 1,402 men even though their exposure time is sufficient for disease to have occurred and exposures are believed to have been in excess of 50 ppm, Dernehl said.

Dernehl conceded that the sample examined may have been too small.

Bio-Test Inhalation Study

Dr. M. L. Keplinger, manager, Toxicology Industrial Bio-Test Laboratories, Northbrook, Ill., reported preliminary results of a study being conducted to determine the effects from inhalation of VC monomer to rats, mice, and hamsters. The protocol for the study was designed by the Manufacturing Chemists Association, he said.

The study was designed as a life-span study in these species which means one and a half to two years for the "in-life" portion, with tissue examination of pathologists and data evaluation to follow this period. The exposures of the animals were started on September 10, 1973, and final results should be available about December, 1975, Keplinger said.

The study was designed to complement the studies of Dr. Cesare Maltoni of Italy. There were 600 animals exposed in a single chamber operated under dynamic conditions, sealed, and operated under slight negative pressure to accommodate leaks, he said.

The concentrations in the chamber are analyzed and monitored daily, and are accurate, Keplinger said. Moribund and dead animals receive gross autopsies and gross lesions are photographed. The major organs of all animals

are fixed for histological examination. Keplinger said only tissues from a few animals have been examined histologically so far.

Study Results

Preliminary examinations of tissues from mice which died after about six or seven months of exposure indicated "possible tumors in the livers, lungs, mammary glands, and/or skin," Keplinger said. On April 15, 1974, MCA and Industrial Bio-Test Laboratories presented these findings to the Environmental Protection Agency, OSHA, and the National Institute for Occupational Safety and Health (Current Report, April 25, p. 1478). Conclusions from the data are preliminary, Keplinger said. He added that the relevance of these findings for prediction or extrapolation to effects in man at the same concentrations and durations of exposure are "quite conjectural."

Tissues other than those of the liver have not been studied to determine other toxic effects from VC and more animals appear to be lost at higher doses, Keplinger said.

A. D. Little Study

Vince P. Ficcaglia, manager of economic analysis and forecasting, Arthur D. Little, Inc., Cambridge, Mass., said the "United States Polyvinyl Chloride Resin Industry Impact Analysis" done by ADL, commissioned by SPI, will be available within 30 days (Current Report, June 27, p. 86).

He indicated ADL research showed the extent to which materials could be substituted for PVC resin in the immediate future (to about one year) is "quite limited" and would have an insignificant effect on reducing ADL's prediction of 1.7 to 2.2 million job losses and the loss of domestic production value of \$65-\$90 billion.

Ficcaglia said because PVC resins can be compounded to yield a wide range of materials with specific properties, the PVC resins are used in more applications than any other type of plastic material. He noted methods used by ADL to prepare the forthcoming report and said "we focused on measuring the magnitude of the economic impact resulting from an immediate shutdown of all PVC resin plants in the nation. Three steps for analysis included identification of PVC resin usage by product and end-use application ("modules"), assessment of the extent of PVC resin dependency in each module, and assessment of the potential for immediate substitution of other raw materials.

Among ADL conclusions was that it would not be possible to duplicate the exact properties of vinyl plastic products by using raw materials, primarily because it would still take up to an additional three or four years to complete all of the necessary research and development leading to the required changes in product, process, and equipment design and the actual delivery and installation of new equipment. He noted also the extreme "tight supply" of substitute raw materials.

Those substitute products which would take the longest time to develop are those that are critical products for the construction and motor vehicle industries, according to ADL.

Angiosarcomas Characterized

John E. Ertel, general manager, Robintech, Inc., Fort Worth, Tex., described a recent meeting of a subcommittee of the Vinyl Chloride and Polyvinyl Chloride Producers Committee at which histories of the 13 U.S. cases of liver angiosarcoma were characterized. These commonalities were:

- Each individual case was exposed to VC for a minimum of 12 and a maximum of 30 years prior to diagnosis;
- Each case was exposed to high time-weighted average exposure to VC for a minimum of ten and a maximum of 28 years;
- Of the 13 angiosarcoma cases, 12 were employed for many years in PVC manufacturing plants, and one in a VC plant. The latter was employed for a brief period of time in a PVC plant as well;
- None of the 13 cases were reported to have had Acroosteolysis;
- No agent other than VC monomer was found to be related consistently to the 13 cases;
- Four of the 10 fatal angiosarcoma cases were detected only upon retrospective examination of histopathologic preparations from the autopsy at the time of death; and
- No maintenance personnel such as pipefitters, electricians, and the like who could have been exposed to high levels of VC monomer were among the 13 cases.

Among conclusions from these characterizations reached by the group were:

- All 13 cases of angiosarcoma of the liver were employees who had been exposed over long periods of time to continuous high levels of VCM. These levels were frequently above the odor threshold and were estimated to be a minimum of 500 ppm TWA, and may have been as high as 2,000 to 4,000 ppm TWA. There is some controversy in the literature as to what the actual threshold level is for the olfactory detection of VC;
- The data reported last February by Maltoni (Current Report, February 21, p. 1189) indicated that the development of angiosarcoma in rats is does related.

Ertel said the group concluded that the emergency temporary standard of 50 ppm "appears to assure that employees will no longer be exposed to any undue occupational hazards." He noted, however, "additional angiosarcoma cases from among the VC industry workforce are likely to be reported over the next 10 or 20 years since there are still many veteran workers employed who held their jobs during the 1940's, 50's, and early 60's." He said the new attention being given VC "is very likely to lead to increased diagnosis of this condition in the general population." He added there should not be great reliance on the 25 cases per year figure for the general population as an average as a basis for comparing the occurrence of the disease in the general population with its occurrence among workers in the VC and PVC producing industries.

Fabricators and Processors

Several concluding witnesses for the extensive SPI testimony provided evidence of low levels of exposure in processing and fabricating operations and recommended these types of operations be exempted from inclusion in

the final standard. These witnesses called for continual monitoring and OSHA surveillance of VC and PVC fabricating and processing operations. Companies supporting these exclusions included B. F. Goodrich Chemical Company, Diamond Shamrock Chemical Company, Goodyear Tire and Rubber Company, and Gollob Analytical Service Corporation.

Canister Respirators

Robert D. Soule, vice president, industrial hygiene services, George D. Clayton and Associates, Southfield, Mich., said it is not practical and in many ways it is unsafe to operate a chemical production facility when workers are required to wear any type respirators on a full-time basis.

It is not unreasonable, he said, to require such respiratory protection during only a part of the working day. He recommended canister-type masks, with necessary precautions, be used where the concentration of VC permits, because of the greater mobility and freedom of motion that is permitted the wearer. He said also where the concentration of VC exceeds the safe working range of canister-type respirators, only air-supplied respirators of suitable design should be used.

Roger W. Strassburg, director of environmental affairs, B. F. Goodrich Company, said respiratory protection with canisters is necessary only when exposure exceeds the established level, but remains well below emergency conditions.

He indicated there are certain types of operations that require either air-fed hose, such as cleaning "polys" or air tanks, as in the case of tank car unloading and emergency situations. He urged that OSHA allow management the necessary flexibility to select and use the most appropriate respiratory equipment for the protection of employees.

Medical Surveillance

Dr. Maurice N. Johnson, director of environmental health, B. F. Goodrich, said the proposed medical surveillance provisions have three major deficiencies. The proposal is directed to detection of angiosarcoma of the liver or other liver disease, rather than to evaluating the general health of employees. The examination should not be directed exclusively toward liver pathology, he said. The proposed standard attempts to define which tests should be done to discover liver angiosarcoma, or the pathology which may precede it even though it is generally recognized that none of the proposed tests has yet been demonstrated to be definitive for this purpose, he said.

Johnson said the proposed standard leaves little room for the clinical judgment of the examining physician in evaluating the health status of the employee and recommending the advisability of his working in any given environment.

Johnson said a better approach was used by OSHA in dealing with its standard for other carcinogens. "Adoption of a medical surveillance standard similar to that already promulgated for the other carcinogens would best accomplish" evaluation of employees' health, he said.

Plastics Industry Stand

Industry spokesmen, led by the Society of the Plastics Industry, Inc., recommended changing the scope of the standard for exposure to VC proposed by OSHA.

The standard should encompass only those areas and operations that pose or may reasonably be expected to pose problems and be made inapplicable to certain types of operations, primarily processing and fabricating plants, Jerome H. Heckman, SPI counsel, testified.

Heckman said there are few problems in the cited operations that could not be handled by proper ventilation and work practices, and said for these operations, there should be a separate standard or work practices prescribed. Fabrication plants and processing plants should be excluded from the scope of the standard, he said. The only problems in these plants are found in unloading or mixing areas and these problems should be handled apart from the proposed standard, he said.

SPI recommended a change in section (b) (4) of the OSHA proposal that would provide "no area be considered contaminated where the polyvinyl chloride received or used therein contains less than 0.1 percent residual monomer now or less than 0.01 percent residual monomer by October 5, 1977."

The definition of "emergency" in Section (b) (8) should be altered, SPI said, to follow the National Institute for Occupational Safety and Health recommendations of March 11, 1974, which defined the term as "an unforeseen circumstance or set of circumstances, such as a ruptured transfer line, resulting in the release of vinyl chloride sufficient to produce acute symptoms among workers exposed or having contact with vinyl chloride."

He said the industry position favors constant sequential monitoring, with specified procedures in lieu of the presently proposed 95 percent confidence level requirement which SPI considers "vague and meaningless."

The employee monitoring observation provision (Section (e) (3)) should be revised so that the observation of the monitoring would be handled by an elected employee, he said.

Heckman said SPI is "unable to see how the public interest would be served by the type of sign and labeling language recommended by OSHA, and noted the need for instruction of employees in the hazards involved independent of labeling. He cited the obvious example of labeling of cigarette packages.

B. F. Goodrich

Anton Vittone, president of B. F. Goodrich Chemical Company, Cleveland, Ohio, appearing with the plastics industry panel, cited the "inherent uncertainties of extrapolating from animals to humans, and referring to Maltoni's experiments (Current Report, February 21, p. 1189) said the recent results of Maltoni's data, where rats were exposed to 50 ppm of VC, indicated that the latency period was approaching the life span of rats which "we understand is equivalent to an 80-year human life-span."

It is the position of industry that it will commit itself to lowering exposure of its workers by a combination of lower levels of vinyl chloride in the work atmosphere and work practices, he said. Vittone noted that SPI (Current

Report, June 27, p. 83) recognized that its proposal makes "projections for improvement which are not in hand but depend on new developments and additions to facilities."

He said further that the product of VC, its polymerization into PVC resin, and the processing of PVC resin into semi-finished products, is treated in the proposed standard as "one industrial health problem," and noted the difficulties in such an approach. That segment of processes involving the manufacture of VC and PVC resins "are not a monolithic operation," he said.

Vittone said the imposition of the "no detectable level" would require the full-time utilization of self-contained breathing apparatus during the work period in VC and PVC resin-producing facilities which would impose a "severe and unnecessary physical burden on workers as well as potential health and safety problems."

Need for Variances

Vittone said it should be recognized that SPI's proposal would require ambitious and difficult expenditure problems and many companies probably would require variances of time or methods. Such provision for variances should be included in the standard, he said. It should be recognized also that medical and epidemiological data may be developed in the meantime that will require or allow a reexamination of the proposed levels.

SPI President Ralph L. Harding, Jr., said total plastics production in 1973 was 27 billion pounds, including PVC and other vinyls, 5.4 billion pounds, according to SPI statistics.

Dr. Joseph F. Tomashefski, chief, pulmonary disease department, Cleveland Clinic, said respirators, if used, should be selected carefully for the specific hazard. He noted undesirable features and hazards associated with respirators including increased resistance to breathing, decreased efficiency of function, poor fit, leakage, false security, allergic reactions, irritation from perspiration and other particulate depositions, rebreathing, dead-space ventilation, poor vision, fogging of the eyepieces, speed impediments, and psychological and contamination problems. Also, he added, a large segment of the population, many already working within industry, have chronic obstructive pulmonary diseases such as bronchitis and emphysema and should not be employed in a work environment which requires the continued or frequent use of respirators.

Tomashefski added he did not see how wearing of respirators could be enforced.

Support for Proposal

Dr. Irving J. Selikoff, professor of medicine, Mount Sinai School of Medicine, and co-chairman of the Working Group on Toxicity of Vinyl Chloride-Polyvinyl Chloride, New York Academy of Sciences, said "the only prudent course for the prevention of hemangiosarcoma of the liver among VC workers is to provide a work environment with no detectable level of VC."

Accidents will occur and higher levels of VC will result, and in such circumstances, as the proposed standard states, appropriate personal protection should be provided, he said. In terms of human experience, there are only two

benchmarks, Selikoff said. The only safe level that is known to avoid VC-associated hemangiosarcomas, is zero, and at the other end of the spectrum, it is known that hemangiosarcomas have occurred at levels of exposure which were obtained in the past in polymerization plants.

Although there was a published threshold limit (TLV) for VC of 500 ppm, recommended by the American Conference of Governmental Industrial Hygienists, apparently little monitoring or surveillance was done and few companies had any significant number of measurements made, until recently, he said. There are no data whatsoever concerning populations or workers exposed at five ppm, 10 ppm, or 15 ppm, that might correlate with observations concerning long-term risks at 15, 20, 25, or 30 or more years from onset of exposure, Selikoff added.

Selikoff discussed numerous ongoing medical experiments being conducted by himself and many scientists, the results of which are not all complete. He said the proposed standard states that "if liver function abnormalities are determined to be unrelated to liver disease, the employee may be permitted to return to VC-related employment subject to individual medical evaluation," and expressed doubt about the wisdom of the phrase.

Exposure of Women

Selikoff referred to the demonstration by Maltoni that exposure of pregnant rats to VC may result in angiosarcoma in the offspring. This indicates that women in the childbearing age should not work in any area in which there are detectable levels of VC and "this should be made a hard and fast rule," he added.

Harvard Study

A 50 percent excess of deaths due to cancer was found in a study of two Kentucky B. F. Goodrich plants where workers were exposed to vinyl chloride monomer and polyvinyl chloride, according to Dr. John M. Peters, associate professor of the Harvard School of Public Health.

The study, preliminary results of which were given by Peters during the hearing, showed multiple cancer sites in those studied, and an increase in cancers in the population studied.

Death certificates of 161 white, deceased males from the two plants were tabulated. The expected cases to which the subjects were compared, were derived from data on U.S. white males based on age, time, and cause of death.

Of the 50 percent excess deaths that were found, eight were liver cancers, five of which were angiosarcomas. The observed number of liver cancer cases was 10 times the expected number, Peters said. There was a 60 percent excess of lung cancer (13 cases with 7.9 expected), and a 320 percent excess of brain cancer (5 cases with 1.2 expected). Peters noted suicide was excessive also, 10 cases with 5.3 expected. Single cases of unusual cancers were also observed, he said.

Peters said "the time trend is also alarming." Cancer experience in this population before 1965 was almost as expected. Since 1970, there have been 19 cancer deaths with 9.2 expected, he said.

This proportional mortality analysis does not allow the calculation of cancer rates. It is possible that this group of workers does not suffer a greater overall mortality than the general population, Peters said. "The excess of several specific cancers plus the time trend suggest a causal link between occupational exposure to VC and cancer," Peters said.

The study was directed by Dr. Richard R. Monson, Harvard University, and was initiated in February. The study was financed by Harvard and all information was obtained exclusively from the death certificates, according to Peters.

Dow Chemical

A team of witnesses from Dow Chemical Company presented evidence that operations are limited generally to worker exposure of 10 ppm on an eight-hour time weighted average in most operations.

Occasional malfunctions of equipment or other temporary situations can cause brief periods when VC concentrations are higher (often called "excursions"), spokesmen said.

K. H. Oelfke, production manager, Texas Division of Dow, said medical records indicated the Dow worker population exposed to VC had a malignancy rate no different than that expected for the unexposed group with which they were compared. The accumulated records show no evidence of any deaths due to angiosarcoma or other liver malignancy of any kind in Dow workers exposed to the chemical.

Other Dow witnesses described monitoring systems in use. It was pointed out that flexibility in design of monitoring systems to allow the use of methods most appropriate for each plant situation was "very important."

Continuous area monitoring was suggested as the best way to provide early detection of equipment failure or malfunction that could result in worker exposure. This equipment can be coupled to alarm systems to give immediate alerts when concentrations rise, it was noted.

Tenneco Chemicals

Joseph Fath, vice president, Tenneco Chemicals, Inc., said Tenneco proposed sequential monitoring of all areas within the PVC polymerization plant sites.

This is considered a vastly superior and a more conscientious technique of checking existing levels than personnel monitoring, Fath said. He said it is essential that the permanent standard recognize the need for a time period during which engineering and operational changes can be made in line with the more detailed proposals.

A vital element in Tenneco's proposal is the proposed "drastic reduction" of residual monomer content in the PVC resin to be delivered to Tenneco customers to 100 ppm or 0.01 percent maximum by October 5, 1977. "This residual monomer constitutes the only source of VCM which is released from PVC resin because PVC does not depolymerize," Fath said.

Fath said it would be feasible to comply with the levels of exposure presented in the proposal of the Society of the Plastics Industry, Inc. (Current Report, June 27, p. 86).

Air Products

Richard Fleming, group vice president, Air Products and Chemicals, Inc., said the proposed standard fails to meet the basic requirements in the Occupational Safety and Health Act either as to necessity or technical and economic feasibility. It represents a substantial departure in principle from other standards, he said.

Fleming proposed a limit of 25 ppm with a 40 ppm ceiling, in place of the no detectable level. Monitoring should include both the work done and the employee, he added. Respirators should be of the half-face or full-face, air supplied type, and should be worn as soon as possible after it has been detected that the ceiling has been exceeded. Impervious suits should not be required, but clean work clothing should be furnished as appropriate. "We propose that the permanent standard not apply to PVC, waste streams, or finished or semi-finished products, including compound, which contain less than 0.05 percent by weight uncombined VC, or to transportation or processing of PVC with this level of free VCM," he concluded.

Health Hazards

PROPOSED VINYL CHLORIDE STANDARD TO BE DELAYED UNTIL FEASIBILITY STUDY

The standard on vinyl chloride will not be issued until a study of the technological and economic feasibility of safe levels recommended by the National Institute for Occupational Safety and Health has been made, Daniel P. Boyd, director, office of standards development, Occupational Safety and Health Administration, told OSHR.

It is understood that the contract for the study will be awarded to Booz Allen Applied Research, Inc., Bethesda, Md., OSHR learned. "Now that we have the drift of the hearings of VC (Current Report, June 27, p. 83), we are able to focus on the cost-benefit elements which must be part of our decision-making process," Boyd said. Included in this process are ideal standards for total protection of workers in all circumstances, technological and economic feasibility of achieving these standards, and psycho-social and political considerations, he stated.

"What we in OSHA have to do is to arrive at a practical solution based on a subjective, but detailed, analysis of all of the factors under consideration," Boyd stated. He doubted that the final standard would require "no detectable exposure" as originally issued by OSHA (Current Report, May 9, p. 1539). OSHA will issue a final standard on or before the deadline of October 5, he said.

Other Standards

Boyd said proposed standards for lead, beryllium, carbon monoxide, and toluene diisocyanate (TDI) will be issued during the next few months (Current Report, June 13, p. 35). "There is action being taken on all 12 NIOSH criteria documents that we have in-house now," he said.

Action on the criteria documents will receive top priority as soon as the VC standard has been issued, OSHR was told.

Boyd mentioned that negotiations with the Environmental Protection Agency on the draft noise standard issued by OSHA in June (Current Report, June 6, p. 4)