



Dow U.S.A.

The Dow Chemical Company
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Attached is a copy of the final medical surveillance report prepared for this year's Health Team Review. If you have any questions or suggestions, please let us know. This is an expanded version of the information that was presented at the Health Team Review and has been prepared to be submitted to the U.S. Area Occupational Health Department.


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mab

Attachment


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DO 078378
CONFIDENTIAL

SOLVENTS/EDC I
HEALTH TEAM REVIEW
MEDICAL DATA

Plant:	Solvents/EDC I
IH Number:	0161
Period Reviewed:	1990
Date of Review:	February 27, 1991
Reviewed by:	M. F. Currier, M. D. G. D. Kusch, M. D.

Background Information:

The primary products of the Solvents/EDC Plant are carbon tetrachloride, perchlorethylene, and ethylene dichloride (EDC). On the Solvents side of the plant, multiple hydrocarbon feedstocks containing three or fewer carbons are reacted with chlorine. A series of distillations are used to separate the perchlorethylene and carbon tetrachloride which are then filtered and sent to storage tanks. In addition to these primary products, hydrogen chloride is produced and is either sent to the Vinyl II plant for use in making EDC or made into hydrochloric acid in the Solvents plant. On the EDC side of the plant, EDC is produced utilizing chlorine and ethylene. By-products are utilized as raw materials in the Solvents plant. The EDC is either sent to the Vinyl II plant to be used for making vinyl chloride monomer or it is sent to storage tanks. Multiple chlorinated hydrocarbons are created as by-products of these processes including hexachlorobenzene (HCB), hexachlorobutadiene (HCBd), polychlorinated biphenyls (PCB's), and various chlorinated ethanes.

Workers in the Solvents/EDC I plant undergo audiograms, blood chemistries, and HCB blood levels yearly. They have periodic core exams every two years. 1990 was a year in which only the audiograms, chemistries and HCB's were performed.

Hazards Review:

Review of the CPAI shows a large number of TSCA 8(d) chemicals are present in the plant (see accompanying list). No chemical present in the plant carries a priority rating of 1 or 2. The primary health concern related to potential exposures in this plant is hepatotoxicity. HCB levels have been followed in workers for many years and have been declining progressively. These falling levels reflect the significant engineering and housekeeping changes which have taken place in the plant to reduce exposures. Applicable Dow Medical Surveillance Requirements (MSR's) are Hexachlorobenzene, Carbon Tetrachloride, Perchloroethylene, 1,1,1-Trichloroethane, Ethylene Dichloride, and Noise. In addition to Medical Surveillance, extensive Industrial Hygiene monitoring takes place in the plant on a regular basis.

Health Surveillance Statistics:

Dow:

Eligible:	60	
Participating:	58	97%
Males:	55	
Females:	3	

Contractors:

Eligible:	39	
Participating:	38	97%

Dow Employees:

Review of the medical surveillance data did not reveal any abnormalities of the blood chemistries which were felt to be due to the workplace. The average SGPT level was 27 units (normal 2-56) with four employees (7%) having levels greater than 56. The HCB levels continue to fall with the average level for workers with five yearly HCB levels dropping from 61 ppb in 1989 to 51 ppb in 1990 (see accompanying graph). Thirty-two workers with four yearly HCB levels showed a decline from 46 ppb in 1989 to 40 ppb in 1990 (see accompanying graph). There were no standard threshold shifts in hearing. Ten employees (17%) had average hearing loss of greater than 25 dB in one or both ears. Average cholesterol fell from 204 mg% in 1989 to 197 mg% in 1990.

Contractor Employees:

Review of the medical surveillance data did not reveal any abnormalities of the blood chemistries which were felt to be due to the workplace. The average SGPT was 26 units with two contractor employees (5%) having levels greater than 56. Nine of the contractor employees have had more than one HCB performed, and eight of these have shown declining levels. Fifteen contractor employees who have been working in the plant for more than one year had HCB levels below the limit of detection. There were no standard threshold shifts in hearing. Thirteen contractor employees (34%) had average hearing loss of greater than 25dB in one or both ears.

Remarks:

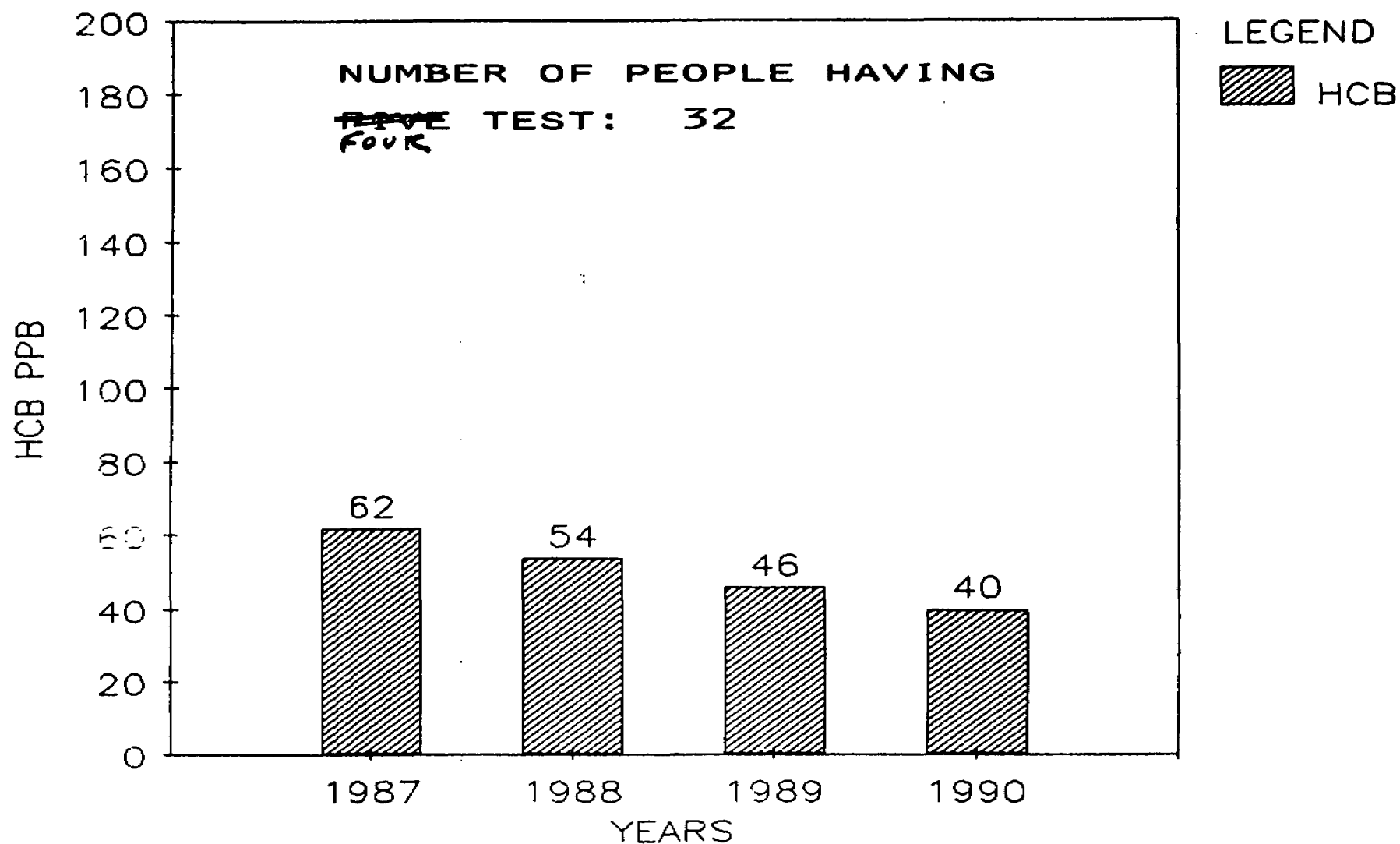
There continues to be extensive Industrial Hygiene monitoring for multiple hydrocarbons as well as noise in the plant. Noise dosimetry data for job assignments would be helpful for objectively evaluating individual noise exposure. This information is particularly helpful when evaluating standard threshold shifts if any should occur. Emphasis on proper use of hearing protection should continue, and off the job hearing protection should also be emphasized in training sessions. The continued fall in HCB blood levels demonstrates the positive results of improved engineering controls and improved housekeeping in the plant. Several projects are planned in the future which will further decrease the potential for chemical exposures. These include a gradual change to the use of seal-less pumps, a closed loop sample system, a low fugitive emission valve project, and a vent recovery system for the tank farm, loading rack and dock areas.

We encourage you to share the medical surveillance results with the employees in the plant, and if there are any questions or you would like one of us to discuss the results, please give us a call.

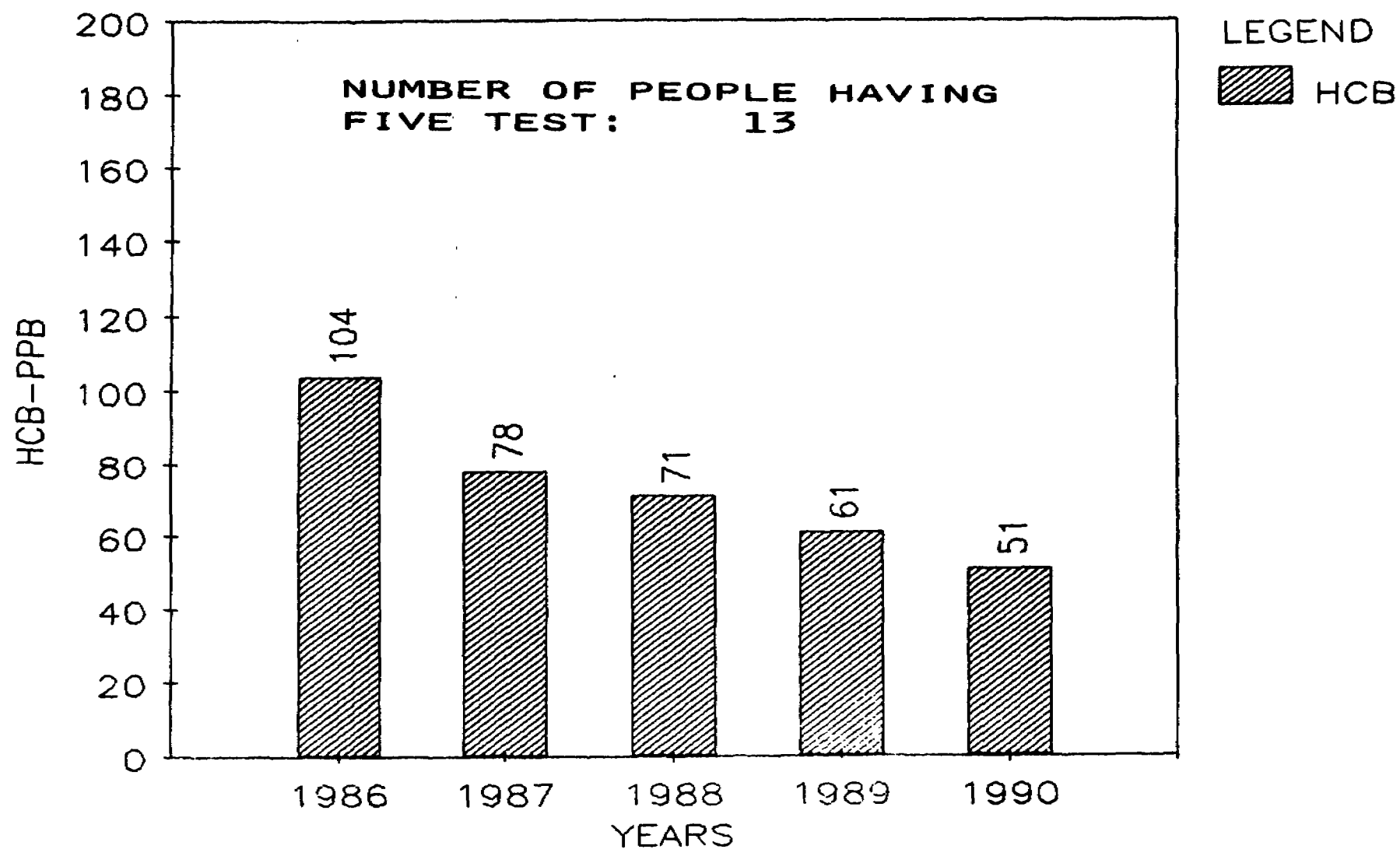
TSCA 8(d) Chemicals on Solvents/EDC 1 CPAI

**Bromodichloromethane
Bromoform
Chloroform
Epichlorohydrin
Ethyl Chloride
Ethylene Dichloride
Hexachlorobutadiene
Hexachloroethane
Methylene Chloride
Perchloroethylene
Propylene Dichloride
Propylene Oxide
Toluene
1,1,1,2 Tetrachloroethane
1,1,2 Trichloroethane
1,1,2,2 Tetrachloroethane**

SOLVENTS HCB SERUM LEVELS 1987-1990



SOLVENTS HCB SERUM LEVELS 1986-1990



HEALTH TEAM REVIEW 1991

SOLVENTS/EDC I

DOW EMPLOYEES	1990	
Eligible	60	
Participating	58	97%
Male	55	
Female	3	
SGPT (Liver Enzyme)	27	units
Greater than reference range	4	7%
Standard Threshold Shifts	0	
Hearing loss greater than 25 dB	10	17%
Cholesterol	197	mg%
less than 200	36	62%
200-239	15	26%
greater than 239	7	12%

HEALTH TEAM REVIEW 1991

SOLVENTS/EDC I

CONTRACTOR EMPLOYEES	1990	
Eligible	39	
Participating	38	97%
SGPT (Liver Enzyme)	26	units
Greater than reference range	2	5%
Standard Threshold Shifts	0	
Hearing loss greater than 25 dB	13	34%
Cholesterol	190	mg%
less than 200	25	66%
200-239	10	26%
greater than 239	3	8%