

Memorandum

AIR
PRODUCTS 

To: F. J. RYAN

Dept..

From: R. E. GAOMSKI

Dept./Ext: CHEMICALS MANUFACTURING/5987

Date: 26 OCTOBER 1984

Subject: OCCUPATIONAL HEALTH

cc: A. E. Greene
H. J. Ortega (139)
H. L. Watson
J. M. Norwood
P. L. T. Brian
R. C. Sander
J. T. Wharton

BACKGROUND

As indicated to you in June of this year, [REDACTED], a PVC worker at our Calvert City Plant, died on 28 October 1983 of illnesses which were initially diagnosed as cirrhosis of the liver (non-alcoholic). Subsequent evaluation by Armed Forces Institute of Pathology indicated the condition to be angiosarcoma of the liver. The family of [REDACTED] recently gave permission to have the autopsy materials evaluated by Fenton Schaffner, M.D., Chief, Division of Liver Diseases, the Mount Sinai Medical Center, New York, N.Y. On 27 September 1984 a confirmation of the diagnosis of angiosarcoma of the liver was made. This is our first case of angiosarcoma.

To date there have been 110 cases of angiosarcoma found worldwide with 35 of these being in the United States. Angiosarcoma is a rare form of cancer that has occurred among a small fraction of persons who had been exposed to vinyl chloride monomer over a prolonged period at very high concentrations. The prognosis of the illness is fatal; analysis of the cases that have occurred worldwide indicates that VCM exposures that may give rise to this disease were generally in the range of hundreds of parts per million (ppm) and occasionally even above the thousand ppm level. The exposure conditions which led to Jesse Boren's illness are believed to no longer be present in our operations. Currently our VCM exposures are limited to 1 ppm or less.

WORKMEN'S COMPENSATION CLAIM

After her husband's death, [REDACTED] filed a workman's compensation claim. Air Products is maintaining weekly compensation payments to [REDACTED]. Now that we have confirmed the cause of death the claim will be fully resolved.

[REDACTED] is 60 years old and, at an actuarial life of 14.1 years and a weekly benefit of \$138.83, will receive \$102M during her lifetime. Since this case involves two employers, we anticipate that the state of Kentucky will pay the bulk of the claim, reducing APCI's total liability to less than \$25M. APCI's Legal Department will resolve any outstanding claim issues as soon as possible.

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POTENTIAL FOR FUTURE ILLNESS

This case will be classified as an occupational illness, fatality. [REDACTED] started working in PVC in 1963. At that time, the harmful effects of high continuous exposures to vinyl chloride and the incidence of angiosarcoma were not recognized. His early work history included that of reactor cleaner, one of the jobs now recognized to have the highest exposures and incidence of angiosarcoma. Exposure levels at that time are believed to have been several thousand ppm for long periods and are many orders of magnitude greater than today's levels of less than 1 ppm. Few industrial hygiene controls were in effect at that time; the principal concern was the flammability of VCM.

APCI has about 75 persons with vinyl chloride exposure history approaching or past 20 years, with another 35-40 nearing the 15-20 year bracket. Based on the worldwide incidence rate of angiosarcoma in heavily exposed workers whose work history predates 1974, we would expect not more than one additional case of angiosarcoma may be found among our workers. There are no routine (non-invasive) diagnostic techniques which are effective for early detection of this disease, nor are there any known successful treatment procedures.

CONTROLS IMPLEMENTED TO PREVENT VCM OVEREXPOSURE

Starting in 1974, there have been many engineering controls implemented to control exposure. We believe the risk to the health of the present workers is very small. Among the controls which have been implemented are the following:

- a) Prohibition of discharge of vinyl chloride to the atmosphere.
- b) Closed system operation with purging and verification before opening any vessels to the atmosphere.
- c) Incineration of any purge or off gases to destroy vinyl chloride content.
- d) Development of "large reactor" technology which have reduced the number of places where leaks can occur.
- e) Stripping of PVC product to reduce the free vinyl chloride remaining.
- f) Use of on-line monitoring systems together with warning signals to give notice of any leak in the breathing zone.
- g) Implementation of a rigorous respiratory protection program to be used in conjunction with on-line monitoring and leak patrols.
- h) Use of leak patrols to quickly address even minor leak sources.
- i) A medical program which though non-specific for detection of angiosarcoma is designed to permit identification of those individuals who may be pre-disposed to liver abnormalities and may be at greater risk if they work with vinyl chloride.
- j) Changes have been made in PVC technology by the development of solvent cleaning methods and anti-fouling techniques to eliminate such high exposure jobs as reactor cleaner where Jesse Boren worked in his early career.
- k) Work practices and employee training in the hazards of vinyl chloride have been implemented.

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Today we handle vinyl chloride in both our PVC plants and our Calvert City emulsions (EVCL) operations. We believe that the control measures that have been implemented are adequate and that there is little threat to the health of our workers from present day operations and exposures. We are also not aware of any actions we can take at this time which would be beneficial to those of our worker population (about 115) who may have been exposed to much higher and prolonged exposures to vinyl chloride in their early working careers.

MANAGEMENT COMMITTEE

I plan to review [REDACTED] case with the Management Committee on November 6th. Our principal thrust will be our Industrial Hygiene programs. You will recall we promised such a presentation to Dexter Baker when the claim was resolved.

R. E. GADOMSKI

REG:mcs

Attachments

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CHEMICALS GROUP INDUSTRIAL
HYGIENE POLICY

AIR PRODUCTS RECOGNIZES AND ACCEPTS ITS MORAL AND LEGAL RESPONSIBILITY REGARDING SAFETY, HEALTH, AND ENVIRONMENTAL MATTERS. WE WILL CONDUCT ALL CHEMICALS GROUP ACTIVITIES WITH A MAXIMUM CONCERN FOR THE SAFETY, HEALTH, AND ENVIRONMENT OF OUR EMPLOYEES, OUR CUSTOMERS, THE COMMUNITIES IN WHICH WE OPERATE, AND THE GENERAL PUBLIC.

WITH REGARD TO INDUSTRIAL HYGIENE, IT IS OUR POLICY TO PROVIDE A WORK ENVIRONMENT FREE OF HARMFUL EXPOSURES TO CHEMICALS AND OTHER AGENTS WHICH MAY POSE A HAZARD TO HEALTH.

AP00034041

OCCUPATIONAL DEATH - ANGIOSARCOMA - [REDACTED]

DATE OF BIRTH: 29 AUGUST 1922
DIED: 28 OCTOBER 1983
AGE AT DEATH: 61

WORK HISTORY:

21 MARCH 1960 - HIRED AS MATERIALS HANDLER IN PLASTI-
CIZER PLANT

1 JAN. 1962 - TRANSFERRED TO PVC COMPOUNDING AS A
MATERIALS HANDLER

1 JAN. 1963 - TRANSFERRED TO PVC POLYMER AREA AS AN
OPERATOR TRAINEE

31 DEC. 1970 - CALVERT CITY PLANT ACQUIRED BY APCI

30 JULY 1982 - TRANSFERRED TO UTILITY AREA

8 SEPT. 1983 - WENT ON SICK LEAVE

DATE OF EMPLOYMENT TO DATE OF DEATH: 23 YEARS

DATE INTO PVC TO DATE OF DEATH: 20 YEARS

TIME IN PVC AS AN APCI EMPLOYEE: 11½ YEARS

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ANGIOSARCOMA CASES BY COUNTRY

UNITED STATES	35
WEST GERMANY	21
FRANCE	17
CANADA	10
UNITED KINGDOM	8
SWEDEN	5
YUGOSLAVIA	4
ITALY	4
CZECHOSLOVAKIA	2
JAPAN	2
NORWAY	1
BELGIUM	1
TOTAL	110

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CHRONOLOGY OF U.S. DEATHS FROM ANGIOSARCOMA

DEATHS

1961	1
1962	0
1963	0
1964	1
1965	0
1966	0
1967	0
1968	3
1969	2
1970	1
1971	1
1972	0
1973	3
1974	1
1975	4
1976	3
1977	1
1978	2
1979	0
1980	4
1981	0
1982	1
1983	2
1984	3
TOTAL	33*

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ANGIOSARCOMA CASES IN THE U.S.
BY COMPANY

GOODRICH, LOUISVILLE	15
UNION CARBIDE, S. CHARLESTON	9
GOODYEAR, NIAGARA	4
OTHERS	<u>7</u>
TOTAL	35

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INDUSTRIAL HYGIENE MILESTONES

<u>ACTIONS TAKEN</u>	<u>DATE</u>
VCM SAFETY ASSOCIATION FORMED	1969
CMA STUDIES ON VCM STARTED	1971
CMA EPIDEMIOLOGY RESULTS AVAILABLE	1973
TDA PLANT DESIGN MODIFIED TO ADDRESS HYGIENE CONCERNS	1972-1975
VCM EXPOSURE REDUCTION	STARTING 1973
o REACTOR BUILDING VENTILATION	
o ON-LINE AIR MONITORING	
o FRESH AIR MASKS	
INITIAL VCM PERSONNEL MONITORING	STARTED 1973
MEDICAL SURVEILLANCE OF VCM WORKERS STARTED	1974
LOCAL MEDICAL CONSULTANTS ESTABLISHED	
CHANGE ROOMS/SHOWER FACILITIES IN CHEMICALS GROUP PLANTS	STARTING 1975

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INDUSTRIAL HYGIENE MILESTONES
(CONTINUED)

<u>ACTIONS TAKEN</u>	<u>DATE</u>
COMPUTERIZED MEDICAL RECORDS PROGRAM INITIATED FOR ALL CHEM. GROUP MFG. PERSONNEL	1975
CORPORATE MEDICAL DIRECTOR HIRED	1976
INDUSTRIAL HYGIENISTS HIRED IN CHEMICALS GROUP	1974
PVC REACTOR SOLVENT CLEANING TECHNOLOGY DEVELOPED	1976-1978
LARGE REACTOR PVC TECHNOLOGY IMPLEMENTED	
o ESCAMBIA	1977
o CALVERT CITY	1978
PVC REACTOR ANTI-FOULING TECHNOLOGY DEVELOPED	1979
WORK PRACTICE STANDARDS DEVELOPED	STARTING 1974
o PVC	
o AMINES	
o DABCO	
o DNT/TDA	

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INDUSTRIAL HYGIENE MILESTONES
(CONTINUED)

<u>ACTIONS TAKEN</u>	<u>DATE</u>
CIIT DEVELOPMENTS:	
STARTED	1977
RESULTS	1979
o STUDIES TO DEVELOP DNT BIOLOGICAL MONITORING	1980-1984
SURVEY OF PEER COMPANIES IN THE CHEMICALS INDUSTRY	1984
o REVIEW/COMPARE PROGRAMS	
o UPDATE MEDICAL/RECORDS SYSTEM	
INITIATE MIS STUDY TO REPLACE MEDICAL SYSTEMS	1985
PLAN FOR IMPLEMENTATION OF RIGHT-TO-KNOW LAWS	1984-1985
ESTABLISH PRODUCT SAFETY DEPARTMENT	1985

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PROGRAM EXECUTION

PERSONNEL LEVEL

- o TRAINING
- o AWARENESS
- o AUDITS
- o SAFE WORK PRACTICES
- o ON-LINE MONITORING (VINYL CHLORIDE)

PROFESSIONAL EVALUATIONS

- o HEALTH HAZARD INVENTORY/PERSONNEL MONITORING
- o CUSTOMER AND TOLLER HYGIENE SUPPORT
- o EMERGENCY RESPONSE
- o DEVELOPMENT AND CERTIFICATION OF PLANT S.H.E.
MANAGERS OF INDUSTRIAL HYGIENE

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PROGRAM EXECUTION

(CONTINUED)

OUTSIDE CONTACTS

- o CIIT LIAISON - DEVELOPMENT OF BIOLOGICAL MONITORING METHODS ON NITROAROMATICS
- o INDUSTRY AND TRADE ASSOCIATION CONTACTS (CMA, CIIT, AIHA, AAIH, ETC.)
- o GOVERNMENTAL QUESTIONNAIRES/INPUT TO RULES AND LEGISLATION

MEDICAL PROGRAM

- o COMPUTERIZED MEDICAL AND HYGIENE RECORDS
- o MEDICAL SURVEILLANCE
- o EMPLOYEE COUNSELING

RELATED PROGRAMS

- o MSDS PROGRAM
- o PHR'S/PLANNED CAPITAL PROGRAM
- o PRODUCT SAFETY PROGRAM

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HEALTH RELATED CAPITAL SPENDING, \$M

<u>EY</u>	<u>HEALTH</u>
78	297
79	422
80	802
81	426
82	609
83	500
84	1826

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OPERATIONAL EXPENSES

	<u>\$M</u>
<u>TOTAL SAFETY AND HEALTH OPERATING EXPENSE FY84:</u>	7,600

INCLUDES HEALTH RELATED ACTIVITIES OF:

o CHANGE ROOM/WORK CLOTHING SV	699
o MEDICAL SURVEILLANCE	352
o HEALTH RELATED LABOR COST, INCLUDING	350
- NURSES:	3
- CERTIFIED INDUSTRIAL	2
HYGIENISTS:	
- ANALYSTS:	5

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REGULATORY CLIMATE

REGULATED BY:

- o OSHA
- o EPA

NEW REGULATORY INITIATIVES:

- o OSHA HAZARD COMMUNICATION RULE (RIGHT-TO-KNOW)
- o STATE RIGHT-TO-KNOW LAWS

BIGGEST IMPACT

NEW JERSEY	FLORIDA
KENTUCKY	MARYLAND
CALIFORNIA	

OTHER STATES (AFFECTS PRODUCT SAFETY)

PENNSYLVANIA	WISCONSIN
MICHIGAN	WEST VIRGINIA
MAINE	OREGON
ALASKA	MASSACHUSETTS
ILLINOIS	MINNESOTA
NEW HAMPSHIRE	

- o OSHA VERSUS EPA JURISDICTION
 - o TDA
 - o OSHA EASIER TO DEAL WITH
 - o SELF-REGULATION

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KEY ISSUES FY85-86

- o COMPLIANCE WITH FEDERAL AND STATE RIGHT-TO-KNOW LAWS.
- o MODERNIZE MEDICAL/INDUSTRIAL HYGIENE RECORDS SYSTEM (\$500M).
- o IMPLEMENT EPIDEMIOLOGY PROGRAMS.
- o UPGRADE HYGIENE FACILITIES AT ST. GABRIEL.
- o UPGRADE PASADENA SITE FACILITIES.
- o DNT BIOLOGICAL MONITORING DEVELOPMENT.
- o STRENGTHEN R&D INDUSTRIAL HYGIENE PROGRAMS.
- o CONTINUE PROGRAM TO DEVELOP FIELD S.H.E. MANAGERS AS CERTIFIED INDUSTRIAL HYGIENISTS.
- o STRENGTHEN PRODUCT SAFETY PROGRAMS
 - TOLLERS
 - CUSTOMERS

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