U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
CENTER FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45226

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. 76-111-410

TEXACO, INC.
PORT ARTHUR, TEXAS

AUGUST 1977

I. TOXICITY DETERMINATION

A comprehensive review of available medical information as well as an epidemiological evaluation of the worker group in question has resulted in the finding that there is no evidence that an increased incidence of coronary artery disease due to occupational exposure exists in the Treating Department at Texaco, Inc., Port Arthur, Texas.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Determination Report are currently available upon request from NIOSH, Division of Technical Services, Information and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia. Information regarding its availability through NTIS can be obtained from NIOSH, Publications Office at the Cincinnati address.

Copies of this report have been sent to:

a) Texaco, Inc., Port Arthur, Texas
b) Authorized representative employees OCAW Local 4-23
c) U.S. Department of Labor, Region VI
d) NIOSH Region VI

III. INTRODUCTION

Section 20 (a)(6) of the Occupational Safety and Health Act of 1970, 29, U.S.C. 669 (a)(6) authorizes the Secretary of Health, Education, and Welfare following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found. The National Institute for Occupational Safety and Health received such a request from a representative of OCAW Local 4-23 alleging a possible increased incidence of heart disease, specifically coronary artery disease, and surgical treatment of same in the workers at the Treating Department, acid area, Texaco, Inc., Port Arthur, Texas.

IV. HEALTH HAZARD EVALUATION

The hazard evaluation concerned the problem of assessing whether or not the number of persons undergoing coronary artery by-pass surgery, who worked in the area mentioned above, was related to the work environment to which these people were exposed. The potential exposure consisted of a variety of organic compounds as well as a variety of acids and other agents.

Evaluation Methods

Coronary artery disease and related vascular disorders account for a majority of the morbidity and mortality in the United States. The occurrence of coronary artery disease is influenced by a number of factors. Elevated blood pressure, diabetes, disorders of blood fats (cholesterol and triglycerides), tobacco consumption, obesity and lack of exercise have all been implicated to contribute to the development of early coronary artery disease.

Because of the small population size and the variety of agents to which the involved workers were exposed, NIOSH chose to pursue the study in the following manner. First, the exact number of individuals undergoing coronary artery by-pass procedures as well as those with a diagnosis of coronary artery disease were identified. Second, case histories and medical information were obtained in each individual's case. Special attention was given to the presence of possible contributing disorders mentioned before (i.e. diabetes, etc.). Third, inquiry was made as to the average age and other demographic data available from a large center involved in performing many coronary artery by-pass procedures. This was done to determine the prevalence of coronary artery by-pass surgery as a treatment of coronary artery disease in a population removed from the geographic area involved.

Our epidemiologic evaluation lead us to assess the situation as follows: If the occurrence of coronary artery disease and surgery for this problem was the same or higher in the worker population than a comparison group with few or no contributing factors present (i.e. high blood pressure, etc.), then an occupational cause would be actively sought. If there were no differences between groups or known contributing factors were present in the worker population, then no further investigation would be undertaken because of the impossibilities of completing such an investigation in this particular population.

V. EVALUATION DISCUSSION AND RESULTS

A total of eleven workers were reported to have heart disease of various etiologies (see Table I). Nine of 11 had a history of coronary vascular disease. Four of nine had open heart surgery, coronary by-pass grafts. The mean age for those undergoing surgery was 55 years. The remaining two individuals had problems, one with valvular aortic stenosis and the other a cerebrovascular accident.

Table II shows the incidence of predisposing factors in the worker population in question. Two workers' histories were scant. In the other nine cases, histories were relatively complete. In every case at least one or more predisposing factor was present. A separate investigation to elicit mean age of those individuals undergoing coronary by-pass surgery at Mount Sinai Hospital revealed the operating group to have a mean age of 48.[1]

The HHE requested an investigation of the open heart surgery cases which had been performed on treating department workers. The frequency of coronary by-pass surgeries is not an adequate index of the coronary heart disease risk experienced by a population. The rate of such surgical procedures depends not only on the incidence of coronary heart disease (CHD) in a population but also upon other factors, such as the number of cardiologists in an area and the temporal medical criteria used to decide upon the operation by physicians in the location. Additionally, the individual's ability to undergo surgery and pay for medical bills frequently determine if a surgery occurs. NIOSH has therefore, considered the CHD risk which is the real occupational health issue being addressed by this request. While a study of surgical procedures may be indicative of the level and appropriateness of medical care received, it is only a crude and possibly misleading measure of CHD risk to a population.

VI. CONCLUSIONS

It is apparent from this limited investigation that it is unlikely the workers at the Treating Department, acid area, Texaco, Inc., Port Arthur, Texas, have an increased incidence of vascular disease or coronary by-pass surgery that could be attributed to occupational exposure. The presence of many non-occupational factors that can predispose an individual to coronary artery disease makes the potential contributions to said disease from occupational exposure both remote and impossible to evaluate in this population.

VII. REFERENCES

1. Personal communication. Dr. Richard Gorlin, Professor and Chairman of the Department of Medicine, Mount Sinai Hospital, New York.

Additional Suggested Readings on Atherosclerosis

Harrison, Principles of Internal Medicine, pages 1244-1251.

Symposium on Atherosclerosis, Amer. J. Med. 46:655, 1969.

The Framingham Study, and Epidemiological Investigation of Cardiovascular Disease, Section 10, U.S. Government Printing Office, September, 1968.

VII. AUTHORSHIP

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TABLE I

DATA FROM WORKERS AT TEXACO INC.

TYPES OF VASCULAR DISEASE

Type Vascular Disease	No. of Workers	Surgery Performed	
		Yes	No
Coronary Artery Disease	9	4	5
Cerebrovascular Accident	1		1
Aortic Stenosis (Valvular Heart Disease)	1	1	

TABLE II

INCIDENCE OF PREDISPOSING FACTORS IN WORKERS FROM TABLE I

	Number	Percent
Hypertension (High Blood Pressure)	8 of 11	73%
Diabetes	1 of 11	9%
Obesity	4 of 11	36%
Tobacco Consumption	6 of 11	55%
Blood Fat Abnormalities	2 of 11	18%
Family History of Vascular Disease	4 of 11	36%