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UNITED STATES STEEL CORPORATION
CLAIRTON WORKS

ENVIRONMENTAL & HEALTH SERVICES
DECEMBER 11, 1979

MEMORANDUM

SUBJECT: Mechanic and Apprentice Mechanic Exposures - Garage and Locomotive Crane Repair Station - Compensation Claim - Julius Onyika

On October 9 and 10, 1979, a survey was conducted by the Environmental and Health Services Department to determine the exposures of the mechanics and apprentices to various airborne contaminants.

Criteria:

Section 1910.1000 and 1910.1001 of the Occupational Safety and Health Act limits employee exposures to various physical and chemical agents. The Permissible Limits for those substances present in the garage and repair stations are as follows:

SUBSTANCE	8-Hour Limit (TWA)	Ceiling Limit
Total Particulates	15.00 mg/m^3	-
Chromates	0.05 mg/m^3	-
Iron Oxide	10.00 mg/m^3	-
Asbestos	2 fibers/cc	10 fibers/cc
	(greater than 5 microns)	(greater than 5 microns)

Conclusions:

The personal sampling results indicated the exposures of mechanics and apprentices in the Garage and Locomotive Crane Repair Station to the substances listed were well below the Permissible Limits. Sampling conducted October 9 and 10 indicated Total Particulate exposures of 1.18 mg/m^3, 0.10 mg/m^3, 0.14 mg/m^3 and an Asbestos exposure of 1.35 fibers/cc. The samples collected for chromates analyses indicated no detectable levels of exposure.

Recommendations:

As indicated, exposures to Total Particulate, Chromates, Iron Oxide, and Asbestos were well below established safe limits; therefore, no precautions need be taken by the mechanic or mechanic helper against these contaminants.

Discussion:

The garage is primarily used for motor vehicle repair, and general upkeep of motorized equipment such as portable-welders. All types of services are performed, from visual inspections to engine overhauls.

The personnel were sampled for exposures to Total Particulates, Iron Oxide, Chromates, and Asbestos. The Particulates, including Iron Oxide were evolved by mechanical attrition, although some Iron Oxide may have resulted from the small amount of burning and welding done in the shop. The Asbestos was generated from changing brake shoe pads.

The exposure results indicated all the personnel were below the permissible limits for all substances sampled. The Total Particulates averaged less than 5% of the allowable level of 15 mg/m^3 (1.18 mg/m^3, 0.18 mg/m^3 and 0.25 mg/m^3). No Chromates were detected since very little welding or burning was conducted in the shop. The majority of Iron Oxide found was present in the form of rust. Iron Oxide exposures to the mechanic and apprentice were well below the Permissible Exposure Limit of 10 mg/m^3 (0.26 mg/m^3, 0.10 mg/m^3, and 0.14 mg/m^3). An asbestos sample was collected during a visual inspection of the brake pads of #15 fire service truck. The mechanic, wearing a Dustfoe 66 respirator, blew off the brakes and drum with an air hose. According to his foreman, it is not common practice to use an air hose. Thus, even though his exposure was well below the permissible ceiling limit, it could be assumed that his exposure would have been considerably less had proper procedures been followed. His exposure to Asbestos was 1.35 fibers/cc while the permissible ceiling limit is 10.00 fibers/cc.

T. M. Cain

General Supervisor
Environmental Health & Safety

TMC/cay

cc: W. C. King
H. S. Miller
T. F. Weir, M.D.

MECHANIC AND APPRENTICE MECHANIC EXPOSURES

GARAGE AND LOCOMOTIVE CRANE REPAIR STATIONS

10 - 9 and 10 - 79

TABLE I

OCCUPATION	Time (Min)	Total Particulates (mg/m^3)	Chromates (mg/m^3)	Iron Oxide (mg/m^3)	Asbestos f/cc
Mechanic	421	1.18	0.0	0.26	-
Apprentice	420	0.18	0.0	0.10	-
Apprentice	422	0.25	0.0	0.14	-
Mechanic	7	-	-	-	1.35

Substance:	8-Hour Limit (TWA)	Ceiling Limit
Total Particulate	15 mg/m^3	-
Chromates	0.05 mg/m^3	-
Iron Oxide	10.00 mg/m^3	-
Asbestos	2 fibers/cc (greater than 5 microns)	10 fibers/cc (greater than 5 microns)