PLAINTIFF'S EXHIBIT ED-62

Inter Office

Personnel and Organization Staff

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Mr. Leroy Jaggers, Section Supervisor
Reliability Laboratory, Building 4

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Subject: Industrial Hygiene Survey - Asbestos Exposures at Brake and Tire Laboratory

As requested, an industrial hygiene study was conducted at the Brake and Tire Laboratory, Research and Engineering, Building 4. The purpose of the study was to detect the presence and to determine quantities of airborne asbestos fibers generated during brake wear and performance testing. Employee concerns about working with asbestos-laden materials prompted the study. Several breathing zone, area, and bulk samples were collected over a two-month period in an attempt to document conditions over a variety of dynamometer operations and procedures.

Laboratory brake testing typically involves two to three technicians who operate either a two-stage or four-stage brake dynamometer. Operations can be continuous, but more recently scheduling has been infrequent. Routine operations last several days and fundamentally include:

- Dynamometer set-up including thermocouple placement and some brake sanding
- Frequent brake inspections
- Running simulations (including fade and recovery)
- Clean-up

Both dynamometer test cells are ventilated to regulate brake temperatures as well as to control dust generation. The two-stage unit is more effectively enclosed than the four-stage unit. In the past, set-up, inspections, and clean-up involved compressed air blow-off. This practice must be discontinued and is in the process of being eliminated with the purchase of an asbestos-approved vacuum cleaner.

<u>Method</u>

As specified in 29 CFR 1910.1001, membrane-filter phase-contrast microscopy is the technique advised for compliance purposes. Basically, this method involves fiber counting of any fiber greater than five microns and visible at 450 X magnification under phase-contrast illumination. Two drawbacks are apparent with this method:

1. It lacks specificity for exact fiber identification in that any fiber such as glass fiber, cellulose, etc. can be counted if it fits the length (>5 microns) or aspect ratio (3:1) criteria (length to width).

2. It does not account for the presence of short fibers (<5 microns) that may be toxicologically significant based on current scientific information.

Therefore, to supplement fiber counting deficiencies, further analysis was performed on various bulk samples collected. Either X-ray diffraction or polarized light microscopy was used to identify specific fibers at a 1% detection level.

Results

Fiber counting results are presented in Table I, and bulk sample identifications are presented in Table II. These results, along with survey observations, indicate that:

- In most breathing zone samples collected the average airborne fiber concentrations were below the permissible exposure limits and below the medical action limit.

- The average airborne fiber concentration collected for R. Brandon on 2/8/83 was above the medical action limit. However, upon further analysis, it was difficult to distinguish between fibers of asbestos or cellulose with polarized light microscopy. On subsequent samples the average airborne concentration for this employee was below the medical action limit.

- The average airborne fiber concentrations collected at various areas were essentially at background levels.

- The presence of the chrysotile form of asbestos was found in an example of a typical brake shoe tested at the Brake and Tire Laboratory.

- Residual dust samples collected from the two-stage dynamometer indicated non-detected levels of asbestos at a 1% detection limit. This does not preclude asbestos from being present at a lower percentage ppm level.

- Pipe insulation situated above the Brake and Tire Laboratory contains asbestos.

RECOMMENDATIONS

Chrysotile asbestos is a major constituent of brake lining materials. Biological effects from exposure to this fiber have been well established. Complications are inherent since degradation of this asbestos can occur from thermal stress to a recrystalized form, fosterite, whose toxicology is still unclear but may be related potentially to silica. In addition, this thermal change may not be complete, and chrysotile fibers can still be present in the residual dusts as free fibers. Therefore, the following recommendations are relevant:

1. Prohibit the use of compressed air blow-off at any time. In its place substitute vacuum cleaning with Company-approved vacuum cleaners (99.7% efficient at 0.3 microns).

2. Vacuum cleaner bags must have warning labels that are readily visible.

3. Asbestos waste must be disposed in accordance with OSHA 29 CFR 1910.1001(H) and other prevailing EPA regulations.

4. Medical surveillance is required for R. Brandon.

5. Respiratory protection training is needed in this area. In addition, protection is advised during inspection, sanding, or drilling.

6. Consider a smoking cessation program for this area. It is well documented that smoking can aggravate asbestosis and possibly increase the potential of developing pulmonary, pleural, peritoneal, gastrointestinal, or laryngeal cancer.

7. Encapsulate or clean up pipe insulation that is falling on surfaces in the Brake and Tire Laboratory.

8. Continue employee training on the hazards of asbestos and proper work procedures to minimize exposures.

9. Encourage good housekeeping practices and frequent hand washings.

10. Contact Station Source Environmental Control Office (SSECO) for documenting quantities of asbestos fibers being exhausted into outside environment.

Please respond to Mr. R. Wabeke, Supervisor, Industrial Hygiene Services, Room 104, Central Laboratory, with your plans to be taken or actions already performed on these recommendations.

A. R. Amberg, Industrial Hygienist
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Attachments