



HETA 93-1037-2541 NIOSH INVESTIGATORS

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I. SUMMARY

In July 1993, the National Institute for Occupational Safety and Health (NIOSH) received a request from management at Johnson Brothers Company, Pittsburgh, Pennsylvania, to conduct a health hazard evaluation (HHE) of steel-plate (watertank) sandblasting and painting operations. On October 5-6, 1993, a team of NIOSH investigators surveyed two job sites located in Pike County and Cranberry Township (Beaver County), Pennsylvania, where sandblasting and spray painting were being conducted.

Workers were found to be overexposed to crystalline silica during tank interior sandblasting and shoveling operations at the Pike County site. Airborne concentrations of respirable silica during sandblasting exceeded the NIOSH recommended exposure limit (REL) by a factor of 300-540 while an abrasive blasting hood with an assigned protection factor (APF) of only 25 was used. During sand shoveling operations the NIOSH REL was exceeded by a factor of 94 while a respirator with an APF of only 10 was used.

Deficiencies in the respiratory protection and hearing conservation programs were noted at the Pike County job site. Specific findings included: use of insufficiently protective air-supplied respirators during sandblasting operations; a disconnected in-line carbon monoxide alarm; improper hookup of a compressed airline (compressed air went to a manifold that supplied both a spray paint gun and airline respirators, a potential cross connection); use of air purifying respirators (instead of supplied air respirators) while spray painting in confined spaces; use of respirators requiring a tight face fit by employees with beards; and inadequate training/health and safety knowledge for workers involved in potentially immediately dangerous to life and health (IDLH) situations.

Medical testing was conducted at the same two job sites on October 17-18, 1993. Eleven of the 13 employees at these sites participated in the medical evaluation, which included a medical and occupational history questionnaire, chest x-ray, spirometry testing, and determination of blood lead level. None of the examined workers had radiographic changes suggestive of silicosis. Three had abnormal spirometry test results. An obstructive pattern of abnormality was noted in all three, who had between 7 and 12 years of sandblasting experience and substantial smoking histories, as well. All blood lead levels were at or below 15 µg/dl (micrograms per deciliter).



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Based on the results of this investigation, the NIOSH investigators conclude that during the time of this evaluation, a health hazard existed at work sites operated by Johnson Brothers Company due to employee exposure to respirable crystalline silica. NIOSH recommendations include implementation of effective respiratory protection, hearing conservation, and medical surveillance programs, and the substitution of a less toxic alternative for silica sand as an abrasive blasting material