

addition of the second blast unit to each enclosure, dust was observed coming from the south enclosure and work was suspended in that enclosure. The following day, air monitoring results were received indicating that four of the ten air samples exceeded the maximum use concentration for the powered air-purifying respirators being worn. All work was then suspended.

ANALYSIS: An investigation into the incident revealed that one of the nine hoses on the south enclosure's ventilation machine connecting it to the HEPA filter manifold located inside the building was disconnected. Loss of a hose on the manifold at this point would have severely reduced the ventilation and account for the three high sample results from the south enclosure. However, one of the air samples taken on a blaster working in the north enclosure was also high. Subsequent monitoring confirmed that some workers operating the blasting equipment intermittently exceeded the maximum use concentration of the respirators being worn.

The investigation also revealed that lead paint dust was not being adequately removed by the classifier and lead paint dust was in fact being entrained with the steel shot when it was recycled. It was also determined that with the addition of a second blast unit in each enclosure the volume of steel shot and lead paint dust exceeded the capability of the operators to recover the shot using the magnet and the vacuum system. Workers had begun using brooms and shovels to collect the shot and load it in the classifier since the magnet was too slow and the vacuum system clogged frequently. This in effect eliminated the initial cleaning step of the process. As work proceeded dust levels increased as more and more lead paint dust was being entrained with the recycled shot since the classifier which worked well for sponge blast material was unable to adequately separate the dust from the steel shot.

While the subcontractor had experience with abrasive blasting operations for similar work, there was no data to estimate the impact of adding a second blast unit to each of the enclosures or that the classifier could separate lead dust from the steel shot under these conditions. This resulted in an inadequate evaluation of the process change since the new process had not been adequately characterized by monitoring and the equipment selected for separating lead paint dust from the steel shot had not been proven to be adequate. As a result, improper protective equipment was prescribed, i.e. air-purifying respirators instead of airline respirators.

Workers in the south enclosure failed to recognize that the ventilation system had malfunctioned since streamers used to indicate the machine was working had been placed only on the exhaust of each machine which was located outside the building. These streamers indicated that the machine was running but would not show that a hose had come off the manifold inside the building. There were no streamers inside the enclosure, which would have alerted the workers to the malfunction. Due to the timing of the ventilation failure, i.e. just after a second blast unit was added, workers assumed that the increase in dust levels in the enclosure were the result of adding the second blast unit.

To determine the extent of potential personnel exposure, blood samples of the workers were taken and analyzed for lead. Analysis of the samples indicated workers blood lead levels were well below the action level of 40 ug/dl.

RESOLUTION/RECOMMENDED ACTIONS: To correct these conditions, workers were required to wear airline respirators, the ventilation system was repaired, the two enclosures were combined and a third 18,000 cfm ventilation machine added, streamers were added to the inside of the enclosure, a complete

inspection of the ventilation system was conducted daily, and a supervisor was required to be present in the enclosures during blasting operations. In addition workers were retrained in work practice techniques, informed that sweeping of lead paint dust is strictly prohibited, and that supervision was to be contacted if unexpected conditions occur.

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DOE FUNCTIONAL CATEGORIES: Occupational Safety & Health; Management

BJC FUNCTIONAL CATEGORIES: SH - Occupational Safety & Health; MG -Management

HAZARDS: Personnel Protection; Hazardous Material

WORK ACTIVITY: Decontamination & Decommissioning; Work Control

FOLLOW-UP ACTION: Information in this report is accurate to the best of our knowledge. As means of measuring the effectiveness of this report please notify Joanne E. Schutt at (423) 574-1248, e-mail at s6u@ornl.gov of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is important and appreciated.