Technology Demonstration Summary Sheet
Roto Peen Decontamination

THE NEED

During the decontamination and decommissioning (D&D) process, the treatment of radioactively contaminated concrete floors in order to decrease the surface contamination levels has two principal objectives: to reduce potential for the spread of contamination to personnel and the environment, and to meet regulatory criteria for unrestricted use.

THE TECHNOLOGY

The technology, provided by 3M Company, uses Heavy Duty Roto Peen flaps to remove concrete and coatings from concrete floors (see picture below). The flaps were mounted on an EDCO model CPM-4 floor unit. The system was also outfitted with a Pb Sentry from West Environmental. This proprietary system will shut off electrical power to the concrete planer should the detected vacuum drop below a safe threshold. Captive tungsten carbide shot, supported on flexible flaps, is rotated against the contaminated surface, mechanically fracturing coatings. The particles removed were simultaneously collected in a drum by a vacuum system (VAC-PAC® provided by Pentek, Inc.) fitted with High Efficiency Particulate Air (HEPA) filter. The Concrete Planer used in the demonstration had a cutting width of 5.5 inches. Larger units are available from EDCO.

3M Roto Peen Technology

THE DEMONSTRATION

The demonstration was performed on the service floor of the Argonne National Laboratory (ANL) CP-5 reactor in March 1997, as part of the Large Scale Demonstration Project funded by DOE's Federal Energy Technology Center (FETC). The Roto Peen technology's ability to decontaminate concrete floors by removing the enamel coating was tested on an area of approximately 500 square feet.

THE RESULTS

The Roto Peen technology removed a uniform layer of concrete and coatings from about 500 square feet of floor area at a rate of approximately 71 sq.ft. per person-hour. After removing the layer, five of the six contaminated locations were at or below background levels and the contamination for the sixth location was reduced from 70,000 to 16,000 dpm/100cm^2. The depth of removal was about one sixteenth of an inch. This achieved a uniform appearance on the Roto Peened finished surface. Approximately 2.1 cubic feet (120 lb) of waste in the form of powdery concrete and paint chips was generated during the demonstration. Due to the captive shot, only what was removed from the floor is what entered the waste stream. The vacuum system was sufficient to contain the dust generated using the Roto Peening process, survey smears did not show any removable contamination.

Heavy Duty Roto Peen flaps

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