

HAZARDOUS WASTE RAKE PREVENTS EXPOSURES AND INJURIES AT PUBLIC WORKS CENTER, SAN DIEGO

Hazardous waste disposers at the Navy Public Works Center (PWC), San Diego, CA use 40 cubic yard *roll-off* bins to store hazardous wastes. The *roll-offs* are rectangular steel storage containers that are approximately twenty feet long, eight feet high, and eight feet wide. The bins are fitted with steel wheels so they can be rolled onto and off of transport vehicles, hence the term *roll-off*. The containers are used to store solid hazardous waste debris such as paint chips, rags, contaminated wood, etc. in compliance with California and U. S. EPA waste management requirements. Because the bins have steel doors on top that roll open towards the center, waste tends to build up at the ends of each bin. PWC needs to spread hazardous waste materials more evenly throughout the containers to maximize the use of the containers and to minimize the cost for storage and disposal of hazardous waste.



Access to *roll-off* bin for solid hazardous wastes is through doors in roof of bin

The bin roof doors are the only means to access the containers to redistribute the hazardous wastes. PWC San Diego's hazardous waste disposers used to climb up and down steel ladders on the outside of the *roll-off* bins in order to reach the waste materials inside the bins. A worker used to use a long steel bar to push the waste that had built up at each end of a bin toward the center.

Various safety hazards were associated with the manual redistribution of the waste. Climbing up and down ladders put the workers at risk for slips, trips, and falls. The potential for unintended contact with wastes inside the bin also put workers at risk for exposure to hazardous wastes and occupational illnesses. In order to mitigate the exposure to these hazards, workers had to wear personal protective equipment such as gloves, safety shoes, hard hats, and respiratory protection. This work task decreased efficiency by increasing hazardous waste processing time and disposal costs.

Mr. Grady Beasley, a supervisor in PWC San Diego's Environmental Department, recognized the need to protect workers from the risks associated with redistributing wastes in the bins. He looked into remote control waste-

spreading devices that could be used with a forklift. While reviewing various devices for compatibility with a forklift, Mr. Beasley came up with the idea of a *hazardous waste rake*. The rake looks like an L-shaped fork with six tines. It is approximately eight feet long, five feet high, weighs approximately 400 pounds, and has channels on one end for attaching to a forklift.



Remote control Hazardous waste rake attached to forklift redistributes hazardous waste inside roll-offs

Mr. Beasley submitted his design for the *hazardous waste rake* to Mr. Randy Steffen of the PWC San Diego Environmental Projects Team. Mr. Steffen is also the Environmental Department representative on the PWC San Diego's Employee Driven Cultural Safety Forum (EDCSF). The EDCSF is

a group of representatives from each workshop who meet once a month to discuss local safety challenges and seek out feasible solutions. Mr. Steffen brought the *hazardous waste rake* design concept to the EDCSF for review. The EDCSF approved the design, and the PWC Ergonomic Program Administrator authorized funding. A computerized concept for the *hazardous waste rake* was sent to the PWC Engineers and Machine Shop for plan review and construction.

Now, instead of the 15 to 20 minutes previously required to redistribute waste throughout the *roll-off* bins, redistribution of waste takes only two to three minutes with the *hazardous waste rake*. The rake is used two to three times per day for an estimated annual savings of \$5,200.00 to \$8,800.00 per facility. Additional savings are anticipated from the prevention of work-related injuries and illnesses and decreased workers' compensation expenses. Since several forklifts are typically in use throughout the facility, the time required to connect and disconnect the rake from forklifts is negligible. Because hazardous waste disposers are able to work from a distance from the hazardous waste when using the rake, their risk of contact with hazardous waste and risk of back



Remote controlled hazardous waste rake prevents slips, trips, falls, back injuries, and risk of contact with wastes

injuries from manually redistributing waste are minimized. The risks associated with climbing ladders to access bins have been eliminated.

Members of the PWC Hazardous Waste Operations Division (Code 930) report that they are very pleased with the *hazardous waste rake*, and they recommend its use at other facilities with similar operations.

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