On-site rescue plan urged for confined spaces

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Many employers are mistakenly relying upon public fire departments to rescue workers from confined spaces, such as water and sewer pipes, manholes and tunnels, according to an analysis by University of California, Berkeley, health researchers of hundreds of deaths in the United States over 13 years.

Since fire crews need time to evaluate the hazards at a specific site, companies should instead have rescue personnel stationed at the entrance of potentially dangerous confined spaces who can pull workers out more quickly in an emergency, the study concludes.

The paper, published in the latest issue of the *Journal of Occupational and Environmental Hygiene*, arrives at the same time California's Occupational Safety and Health Administration (Cal-OSHA) is launching a statewide special emphasis program to prevent workplace deaths in confined spaces.

"Our findings show that employers have to take greater responsibility for putting together an effective, timely, on-site rescue program if they are sending workers into these kinds of spaces," said study lead author Michael Wilson, director of the Labor Occupational Health Program at UC Berkeley's School of Public Health. "When something does go wrong, help from fire department crews can be a long ways off."

Cal-OSHA defines a confined space as a work area that:

-- is large enough for a person to enter

-- has limited entry and exit points
-- is not meant for continuous employee occupancy
-- has the potential to be filled with toxic or oxygen-deficient air and/or
-- has certain physical safety hazards

For this study, the researchers analyzed 530 U.S. worker deaths from 1992-2005 that were due to toxic or oxygen-deficient atmospheres in confined spaces. They also obtained from urban fire departments in California data on fire crew arrival times and estimates of the length of time it would take to complete rescue of a victim from a confined space.

They found that the time needed for confined-space rescue operations — which includes extrication and initiation of advanced life support — ranged from 48 to 173 minutes. Even though the arrival time of the first engines averaged 5-7 minutes, firefighters need time to evaluate and control the hazard before they enter the confined space, the study said.

"A confined space emergency is a low-frequency, high-risk event for fire departments, and firefighters have to be careful not to become victims themselves," said Wilson, who worked as a firefighter and paramedic for 13 years before joining UC Berkeley. He is also a member of Urban Search and Rescue Task Force 4 of the Federal Emergency Management Agency (FEMA), housed at the Oakland Fire Department.

"Rescue operations have to be done within four minutes, or they almost always become body-recovery operations rather than rescues," added Cal-OSHA Chief Ellen Widess, who was not part of this study. "Cal-OSHA's new special emphasis programs will focus on ensuring that employers are aware of all the confined spaces in their workplaces, and that they have on-site, ready-to-go rescue teams and equipment whenever employees are sent into confined spaces. Wilson's study adds to the scientific literature and the urgency to do more to protect workers in

confined spaces."

The study found that more than half of the 21 large, Silicon Valley-based companies that responded to a survey depended on calling 911 to rescue their employees trapped in confined spaces. Wilson conducted the survey in collaboration with an industry-based health and safety consulting firm and the Silicon Valley Leadership Group.

Working in confined spaces represents a small but ongoing occupational hazard. In just the past year, there were seven confined-space fatalities in California, including two young employees — a 22-year-old man and the 16-year-old brother he was trying to rescue — who died in October after being overcome by hydrogen sulfide fumes in a drainage tunnel at a compost center in Lamont.

"Nearly every one of the 530 U.S. fatalities we evaluated was thoroughly preventable," said Wilson, who pointed out that the analysis was funded as part of a settlement between a Los Angeles-based company and the L.A. District Attorney's office over the deaths of two workers overcome by argon gas in a heat treatment tank. "The Cal-OSHA special program on confined spaces is a great first step. It will take continuing enforcement in conjunction with outreach, training, and education of employers, workers and unions to prevent future fatalities."

Co-authors of the paper are Heather Madison, an industrial hygienist at the Lawrence Berkeley National Laboratory and Stephen Healy, a battalion chief at the Moraga-Orinda Fire District.

Provided by University of California - Berkeley