

Manure Gas Claims the Lives of Five People

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On July 2, 2007, gas in a manure pit claimed the lives of five people on a Virginia farm. The victims included a 34-year-old farmer who climbed down into the pit to unclog a pipe and was overcome by manure gas. An attempted rescue claimed the lives of four more people that included a worker, the farm owner's wife, and two daughters aged 11 and 9. A similar incident occurred on a Michigan farm in 1989 when five family members died in a manure-receiving pit that had an oxygen deficient atmosphere. It was the same scenario. One person went down into a pit to make a repair and was overcome by manure gas. The other victims died attempting a rescue of the initial victim.

To prevent these types of tragedies from occurring, always follow these guidelines:

- Train all workers and family members in the hazards of confined space manure storage systems so that everyone is aware of how dangerous these areas can be
- Always assume gasses are present
- Before entry, ventilate the pit with explosion proof, continuously powered equipment
- Use an oxygen meter to test the atmosphere before entering the pit and continuously while workers are in the pit. It may be necessary to use a Self-Contained Breathing Apparatus (SCBA)
- Standby attendants need to be in visual contact with the worker in the pit and if need be, be prepared to lift the person to safety with a mechanical lifting device (winch, hoist, or pulley)
- Anyone who enters the pit needs to wear a safety harness with a lifeline that is attached to the lifting device

Do not become another victim. NEVER enter a manure pit, or other confined space area, to attempt a rescue without proper respiratory protection (positive pressure, self-contained breathing apparatus). If someone collapses in a confined space, call 911 immediately. The local fire department or rescue squad has the equipment and training to conduct a confined space rescue.

Some other things that can be done to make manure storage facilities safer:

- Post warning signs at all openings to manure pits. These signs should be in dual languages if necessary
- Eliminate the need for entry by providing access to all serviceable parts (shear pins, cleanouts, etc.) from the outside
- Modify existing systems to relocate serviceable parts to the outside
- Fit all openings to pits with substantial grates to provide some ventilation and to prevent falls or entries to the pit. Stainless steel or fiberglass covers will resist corrosion from hydrogen sulfide. Remember, if it becomes necessary for anyone to enter the pit, continuous powered ventilation must be used

By definition, a confined space is any area that has limited openings for entry and exit, unfavorable natural ventilation and is not designed for continuous worker occupancy. Many manure storage systems can be classified as confined space areas and need to be treated as such. Stored manure goes through an anaerobic digestive fermentation process. This process can generate four deadly gasses; methane, hydrogen sulfide, carbon dioxide, and ammonia. The accumulation of these gasses in a confined space can produce an oxygen deficient, toxic, and/or explosive environment.

A recent study conducted by researchers at Purdue University has identified 77 deaths that have occurred in manure storage facilities in the United States between 1975 and 2004. The study found that 55% of these deaths occurred in dairy operations and 44% occurred in swine operations. A notable finding was the large percentage of youth who died in these incidents. The data indicated that 27% of the fatalities occurred to persons under 20 years of age or younger with 21% involving youth under 16 years of age. The largest percent (34%) of the victims died while conducting repairs or maintenance to manure handling equipment. The second largest percentage of the deaths (22%) occurred to bystanders who entered the storage area to rescue the first victim. Nationally, 60% of confined space deaths occurred to people who tried to rescue someone that have been overcome by hazardous gasses or an oxygen deficient atmosphere and thus, become victims themselves. The average age of those who died in manure storage facilities was 31 years. The majority of cases occurred in the months of May, June, July and August. Most of the cases occurred in the late afternoon.

The Cornell Manure Management Program has a lot of good safety information at their website. The web address is: <http://www.manuremanagement.cornell.edu/>. At this webpage, click on the Resource tab, and then click on the Safety heading. NYCAMH is always available to come to your farm and provide manure hazard awareness training. We can also conduct a safety assessment of your manure system or a safety survey of your entire farm. All our services are offered at no cost, and all information is kept strictly confidential. For more information, please contact Jim Carrabba, Agricultural Safety Specialist at (800) 343-7527 extension 239, or e-mail jcarrabba@nycamh.com. NYCAMH, a program of Bassett Healthcare Network, is enhancing agricultural and rural health by preventing and treating occupational injury and illness.