

On-Duty Firefighter Fatalities Involving Confined Spaces, 2003-2012

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Acknowledgements

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Seven incidents were found in a search for firefighter fatalities involving confined spaces. Eight firefighters were killed in these seven incidents. The victims were not necessarily *in* the confined spaces when fatally injured.

Five of the seven incidents were investigated by the National Institute for Occupational Safety & Health (NIOSH). The investigation summaries and links to the complete investigation reports are shown here.

2003 – Ohio Two firefighters died and eight others were injured in a silo explosion at a lumber company <http://www.cdc.gov/niosh/fire/reports/face200332.html>

On October 1, 2003, a 44-year-old male volunteer fire fighter and a 42-year-old male volunteer fire fighter were fatally injured by a silo explosion at a lumber company. The victims responded to a mutual aid call from a neighboring volunteer fire department already on the scene at the silo fire. Prior to the explosion, fire fighters had opened some exterior hatches at the base of an oxygen-limiting silo and were flowing water through the hatch openings with a piercing nozzle. Fire fighters were also flowing water into the top of the silo via an aerial apparatus. At the time of the explosion, one victim was standing on top of the silo and the other victim was in the aerial basket positioned beside the top of the silo. Eight other fire fighters were injured during the explosion, two requiring hospitalization. The fatally injured victims were transported to regional hospitals via ambulance where they were later pronounced dead.

2003 – Florida One firefighter (recruit) died in a live-fire training exercise in a shipboard simulator <http://www.cdc.gov/niosh/fire/reports/face200328.html>

On August 8, 2003, a 37-year-old male recruit fire fighter (hereafter known as the Recruit) died and four others suffered skin burns and heat exhaustion while participating in their first live-fire training exercise. The training took place in a simulated marine vessel. After completing most of the evolution, the Recruit became separated from his squad as they were returning to the entrance/exit door. All recruits and instructors had exited the structure when the training staff realized a recruit was missing. The structure was "opened up" and the Recruit was found unconscious in cardiopulmonary arrest. Despite cardiopulmonary resuscitation (CPR) and advanced life support (ALS) at the scene, in the ambulance, and in the emergency department of the local hospital, the Recruit died. An autopsy conducted by the County Office of the Medical Examiner concluded the cause of death to be "cardiac arrhythmia" due to "exposure to heat" with "AV node artery stenosis and mild myocarditis" as contributory causes. Findings of the NIOSH investigation support this conclusion. The extreme heat stress could have been avoided if strict compliance with National Fire Protection Association (NFPA) 1403, *Standard on Live Fire Training Evolutions*, had been followed.

2005 – Missouri One firefighter died while riding a manlift to assess a silo fire
<http://www.cdc.gov/niosh/fire/reports/face200534.html>

On November 7, 2005, a 32-year-old male career fire fighter/engineer (the victim) was fatally injured during a silo fire at a livestock feed supplement manufacturing plant. As the fire was being contained in one silo, the victim and the department's training officer were directed to search for fire extension in an adjacent silo. The victim, who was dressed in full turnout gear and wearing his self-contained breathing apparatus (SCBA), received operating instructions from a plant employee on the use of a manlift to access the top of the silo. About one minute later, as the victim was being elevated, the manlift came to an abrupt stop. After investigating potential problems with the manlift, a plant employee climbed a fixed ladder and found the victim wedged between the manlift and the edge of the floor opening on the fourth level. The victim was not breathing and was unresponsive. The plant employee used the victim's radio to call "fire fighter down." Several minutes later, a Captain climbed the fixed ladder to the fourth floor and tried chest compressions with no success. The victim was later pronounced dead on the scene.

2010 – New York One firefighter died at a silo fire/explosion
<http://www.cdc.gov/niosh/fire/reports/face201014.html>

On April 11, 2010, a 26-year-old male volunteer Assistant Fire Chief (the victim) responded to a silo fire at a local farm. Upon arrival, he observed open doors (hatches) on top of the 60-foot metal oxygen-limiting silo. He climbed to the top of the silo via a ladder attached to the outside of the silo and closed and secured the hatches. He descended the silo and when approximately half-way down, the silo exploded. The explosion caused a section of the ladder to detach from the silo and the victim fell about 30-feet to the ground. The victim was given cardiopulmonary resuscitation by another fire fighter at the scene and then transported by ambulance to a regional hospital where he was pronounced dead.

2010 – New York One firefighter died while attempting to rescue a utility worker from a sewer manhole <http://www.cdc.gov/niosh/fire/reports/face201031.html>

On September 6, 2010, a 51-year-old male volunteer fire fighter (victim) died after being overcome by low oxygen and sewer gases while climbing down into a sewer manhole in an attempt to rescue a village utility worker. The utility worker had entered the manhole to investigate a reported sewer problem and was overcome by low oxygen and sewer gases. The incident occurred behind the fire station in an underground sewer line that ran under the fire station. The local utility company contacted the chief of the village's volunteer fire department and requested that a piece of fire apparatus be moved out of the station so they would not block it in while accessing a manhole. The fire chief responded to the station to move fire apparatus so it would not be blocked by the utility trucks. The victim and another fire fighter also arrived at the station to assist. A utility worker entered the manhole behind the station to clear a sewer backup and was overcome by a lack of oxygen and sewer gases and then fell unconscious inside the manhole. The victim then

entered the manhole without any personal protective equipment to help the utility worker and was also overcome by the low oxygen level and sewer gases. The victim and the utility worker were later removed from the sewer manhole by fire department personnel and transported to a local hospital where they were pronounced dead. The medical examiner reported the cause of death as asphyxia due to low oxygen and exposure to sewer gases. *Note: The death of the utility worker was investigated by the New York State Department of Health, Bureau of Occupational Health, Fatality Assessment and Control Evaluation (FACE) program. A link to the New York FACE report will be included in this report when completed. The New York State Department of Labor, Division of Safety and Health also conducted an investigation of this incident.*

The two incidents that were not investigated by NIOSH are summarized below:

2005 – IA A firefighter was overcome by hydrogen sulfide while attempting to rescue someone from the bottom of an 8-foot (2.4-meter) manure pit with 6-8 inches (15-20 cm) of manure left in the pit. He died two weeks later.

2009 – OK A fire chief was attempting to assist a crew of four firefighters who had become trapped inside a bin of soybeans when they ran out of air. The victim entered the bin without SCBA and lost consciousness. He was asphyxiated before he could be rescued.