Multiple-Fatality Confined Space Incident



An independent contractor was found dead at the bottom of an eight-foot-deep underground vault at a sawmill. The contractor was there to perform an annual inspection of the backflow device of the mill's waterline.

At 3:30 p.m. the contractor arrived at the sawmill and proceeded with the inspection. This was his fourth year conducting this inspection at the mill. He removed the steel cover of the manhole and lowered a ladder into the eight-foot-deep vault. There was 14 inches of water in the bottom of the vault.

At 4:00 p.m. a truck driver arrived at the sawmill to pick up a load of lumber and noticed the contractor's truck and the open manhole. He walked over and saw the contractor's body in the water at the bottom of the vault. Emergency services were called.

- The first person to arrive at the scene after EMS was called, was the shipping supervisor, who entered the vault in a rescue attempt.
- A few seconds later, one of the maintenance men arrived and went into the vault to assist with rescue. Neither man was wearing respiratory protection and within two to three minutes both men had passed out.
- Two policemen arrived at the scene, entered the vault (without respiratory protection), and had to be helped out.
- The paramedics arrived and attempted rescue (without respiratory protection) and also had to be helped out.
- The firemen arrived on scene, donned their breathing apparatus, and went in to remove the three men at the bottom.
    - Two men were face down in the water (the contractor and the shipping supervisor).
    - The third man (the maintenance man) was in a sitting position against the wall, his head was not in the water.

The three men removed from the hole, the two policemen, and the two paramedics were transported to a local hospital.

- The contractor and shipping supervisor were pronounced dead on arrival by the attending physician.
- The maintenance man was hospitalized in serious condition.
- The two policemen and two paramedics were treated and released.

Oxygen levels in the space were found to be at 7% – far below the required minimum of 19.5%. Exposure to atmospheres containing less than 10% oxygen can rapidly overcome a person and bring about unconsciousness without warning so they are incapable of helping themselves.

A state safety investigator believes the algae bloom and bacterial action in the water caused/contributed to the low oxygen levels.

Effects of Oxygen-Deficiency	
Oxygen concentration	**Health effects of persons at rest (% vol)**
19%	Some adverse physiological effects occur, but they may not be noticeable.
15-19%	• Impaired thinking and attention. • Increased pulse and breathing rate. • Reduced coordination. • Decreased ability to work strenuously. • Reduced physical and intellectual performance without awareness.
12-15%	• Poor judgment. • Faulty coordination. • Abnormal fatigue upon exertion. • Emotional upset.
10-12%	• Very poor judgment and coordination. • Impaired respiration that may cause permanent heart damage. • Possibility of fainting within a few minutes without warning. • Nausea and vomiting.
<10%	• Inability to move. • Fainting almost immediate. • Loss of consciousness. • Convulsions. • Death.

This is a text-book confined space multiple-fatality incident. The only “lucky” part of this incident is the death toll could have been 7.

Final Word

- Companies with confined spaces must have a confined space entry program.
- Companies contracting to have a service performed on their property should implement and enforce a safety program to be followed by the contractor.
- Independent contractors who are required/expected to enter confined spaces must take measures to protect themselves.
    - The victim had done this work three times before at the mill and countless times at other locations, and likely didn’t give much thought that this job would be any different than the last three times.
- Training and education about the dangers of confined spaces and the risk involved in trying to perform without training and PPE is not optional. It must be done.
- Entry procedures must be developed, posted, and enforced.
- All workers should educate themselves on confined space dangers and their right to refuse work they believe to be unsafe.

https://www.cdc.gov/niosh/face/in-house/full8706.html