

## **Failure to Rescue: Confined-Space Fatalities**

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### **Introduction**

The law is clear. The Code of Federal Regulations has for many years required employers to provide means of egress, emergency action plans, and in the case of employees who enter and work in permit-required as well as construction confined spaces, rescue and emergency medical services. Yet many employers still just don't get it. The latest statistics from the U.S. Department of Labor (USDOL), Bureau of Labor Statistics (BLS) indicate that almost 100 workers per year continue to die in confined spaces in the U.S. Because all confined-space deaths are not reported to the government, anecdotal evidence suggests the actual number of confined space deaths is much higher. Most of those deaths occurred because the employer did not follow regulations and properly prepare to enter the spaces safely—which could have eliminated or controlled hazards and properly prepared the entry team. This presentation will concentrate on the numerous deaths that could have been prevented if the employer had provided proper retrieval, rescue, and emergency services as well as suitable planning and emergency response as required by the regulations. Specifically, the author will discuss two incidents that resulted in a total of six persons dying needlessly because multiple employers (host employers as well as contractors) simply turned blind eyes towards their legal (and moral/ethical) duties. These deaths occurred because the employers intentionally went around the law....to save money, time, and/or effort. These actual cases will illustrate the tragic consequences of failure to plan and then failure to act in confined-space emergencies.

The question is why do employers fail to comply with safety regulations and standards when that failure can lead to employee deaths and injuries? No rational manager intends to harm employees. In the cases discussed below, the author has served in a litigation support role as an expert witness. Nowhere in the review of thousands of pages of reports and deposition testimony was any nefarious intent apparent. To the contrary, while many supervisors and managers did their utmost to proclaim their well-intended work behavior, every one of them stated that they cared about the safety of affected employees. Interesting enough, the reader may not be shocked to hear that many of these folks that had the authority to mediate dangerous and non-compliant circumstances either claimed it was somebody else's responsibility or felt that the law (as they understood it – thus, to them, they were innocently ignorant) was being followed appropriately. And actually, those supervisors or foremen or site safety representatives (as the case may be) that basically said they were unaware of proper safety procedures really did have something of a leg to stand on. In both cases managers appointed on-site safety people who had little to no safety training and certainly no safety credentials. Unfortunately and quite sadly, the author, like all other dedicated safety practitioners, is keenly aware of the dearth of properly trained safety people who actually work on jobsites versus in some far off corporate office. In both these cases,

it is the author's opinion people died because of a lack of a true safety overseer – not somebody placed in a safety authority position because the employer apparently needed to put a warm body (absolutely no pun intended!) to fill a slot. Employers must learn that yes, it is a business imperative to save time and money for their company. But it is not OK to risk lives by trying to save money and effort by assigning employees to critical safety roles who have no safety experience and no formal safety training. There was an old television commercial for a motor oil treatment that had the tag line of, "Pay me now, or pay me later". The commercial was making the case for inexpensive maintenance now over expensive engine repair later. So, employers take note: Put a qualified person in charge of your worksite safety or pay a huge price for cutting corners!

## Case 1 – Construction Confined-Space Fire

OSHA's Compliance Directive CPL 2.100 - Application of the Permit-Required Confined Spaces (PRCS) Standards states that:

"A confined space created during or as a result of construction activity or entered to perform construction activity would usually fall within the scope of the 29 CFR 1926 standards and the general duty clause until the space is turned over for General Industry operations." (Emphasis added.)

Federal law, OSHA's 29 CFR 1926 *SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION* would apply. Specifically, 1926.21(b)(6)(ii) states,

"For purposes of paragraph (b)(6)(i) of this section, "confined or enclosed space" means any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere....."

Additionally,

"All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas." (Emphasis added.)

"The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury."

A power plant was in the process of building liners inside a just-completed, approximately 1000' high concrete stack. The construction activity involved multiple contractor employees as well as the host employer's employees entering the stack continuously for work and inspection. There was a significant risk of death or injuries as a result of fire (through on-going hot work) and respiratory (a significant presence of dangerous chemicals) hazards which were acknowledged by the employers. Thus, safety considerations concentrated on overhead work, respiratory protection, fire prevention, and housekeeping. Inside the elevated stack workers worked inside solid liners with very definite limited means of egress and subjected to fire and respiratory

hazards, so confined-space issues existed. The employers decided to not classify the spaces as confined spaces. And none of the employers properly addressed two of the most critical issues that federal regulations require employers attend to – emergency evacuation and rescue of trapped workers. There were only two exits above ground or floor level from the inside of the tall stack – one located at the 80’ level while the only other exit was located more than 900’ up at the top of the stack. While there was a way to get down from the outside of the stack from the lower exit, there was no outside ladder or any other evacuation means from the roof of the stack.

One night a fire started above the 80’ exit while several workers were working at various higher levels. The fire spread throughout the stack killing one worker who had no exit and was unable to escape from inside the stack which had turned into a chimney. Three other workers became trapped on the roof of the stack with nowhere to go. The fire and fumes were so intense that the three workers had to continuously roll from side to side as they lay on the roof to prevent one side of their bodies from getting seared by the heat of the roof. At one point, to try to escape the heat and fumes, they actually devised a way to hang off the side of the stack – 1000’ up! Because the employers had not prepared or planned for an emergency evacuation, those three employees were stuck on the roof of the stack for three hours. The men had no escape while the fire sent intense heat and fumes their way. As the wind blew and the stack swayed, these men heroically struggled against natural panic due to the very real fear of a horrible death from the heat, the fumes, or the possible collapse of the stack. Not only did their employer not provide a means of egress for self-rescue (by climbing down an external ladder for example), the employers had not arranged for a professional (either a private or a public entity) helicopter rescue service that could have planned and even drilled for such an emergency. Instead, a police helicopter had to respond from another state and attempt an extremely dangerous rescue that could have easily gone terribly wrong. It is the experience of the author that rescues that are planned and practiced have a very high success rate. Unplanned attempts have a much higher failure rate. In the case of the stack fire, the three victims had no understanding of what to do because of no planning, practice, or instructions from their employers. Again, history has proven that the psychological impact to those three men a thousand feet up, in the dark, at the top of a burning structure with no communications means has caused other people in similar circumstances to panic and jump to their deaths. Debilitating Post Traumatic Stress Disorder is an issue these men would face. And the rescue team faced a daunting task with no previous information, knowledge, or experience with this location. The rescue could have very easily resulted in exacerbating the catastrophe.

Employers failed to comply with OSHA’s CFR 1926.34(a) *Means of Egress*. The regulation states that,

“... In every...structure exits shall be so arranged and maintained as to provide free and unobstructed egress from all parts of the...structure at all times when it is occupied. No lock or fastening to prevent free escape from the inside...shall be installed...and effective provisions are made to remove occupants in case of fire or other emergency.” (Emphasis added.)

The regulation further requires the exits to be clearly marked and that, “Means of egress shall be continually maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.” The employers did not have the required evacuation means for workers above the 80’ level of the stack. There was no exit or escape to the outside of the stack

at the 150' level where the employers assigned workers. Internal man lifts and ladders certainly did not provide "free escape from the inside" as the law required.

Employers also failed to comply with OSHA's CFR 1926.35 which requires written emergency action plans to cover those "...designated actions employers and employees must take to ensure employee safety from fire and other emergencies." Specifically, *Emergency escape procedures and emergency escape route assignments* require the employer to "...establish in the emergency action plan the types of evacuation to be used in emergency circumstances..." and "before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the **safe and orderly emergency evacuation of employees.**" The law also requires the employer to "...review with each employee upon initial assignment those parts of the plan which the employee must know to protect the employee in the event of an emergency."

One of the employers' designated "safety managers" (who had little safety experience and formal safety training – no training at all in evacuation planning) did prepare a very simple (one page) plan for a fire in the base/floor of the chimney. His plan did not address what to do if a fire started higher up, as was the case in the incident. The plan instructed employees working at "various elevations" to find and proceed to the nearest safe exit. The problem was that there were only two exits for those workers at elevation – the 80' level or the roof. And if the workers went to the roof, their only option was to "wait for instructions." This plan did not "ensure employee safety from fire and other emergencies..." Egress or evacuation means exiting to a safe location. The roof of a chimney structure on fire is far from a safe place because of the heat and dangerous fumes funneled up the chimney structure. The employers did not have an adequate, compliant plan and means of egress for employees that the employers knew were exposed to extreme hazards entailing the high risk of death or serious injury.

## **Case 2 – General Industry Confined-Space Fire**

A power plant located in the mountains was in the midst of a maintenance turn-around that involved spraying a coating onto the sides of a 2,500' long, 12' diameter concrete and steel water feed pipe that dropped down from an upper reservoir to the plant's turbines approximately 2,000' below the reservoir. As in case one, the work activity involved multiple contractor employees as well as the host employer's employees entering the pipe continuously for work and inspection. Five men were killed in the confined space when a fire started in the space at a coating sprayer sled. But strong evidence indicates the victims survived for almost two hours waiting for rescue that never came.

The water pipe clearly meets the criteria for a confined space as defined by 29 CFR 1910.146, which regulates general industry confined-space entry work activities. Previous to the work beginning in the water pipe, the employers collaborated on their decision that wrongly decided the water pipe was not a permit-required confined space. OSHA requires employers to assess both **existing** hazards (those inherent to the particular space) as well as **potential** hazards (those created by work activity, changes in the space, or hazardous equipment or chemicals that workers bring into the space). The water pipe's inherent hazards included high altitude, limited egress,

slips, trips, and falls (as demonstrated by a shoulder injury sustained by a worker who slipped down while walking on the wet, rounded floor of the steel pipe interior prior to the fire) as well as falls into the turbine blades at the bottom of the space. Most of these hazards would be exacerbated by extremely long evacuation distances from within the space. These long evacuation distances on a floor covered with obstacles such as equipment, sand pots, sprayer platform, air lines, and electrical lines, negatively influence the ability of an injured person to self-rescue after an injury that could readily result in a severe injury. Even a minor injury to the lower body (ankles, knees, and hips) would hinder a worker's ability to escape the space unaided (self-rescue). Additionally, delayed medical and rescue response from outside the facility must be considered due to the water pipe's remote, isolated location that can be reached by only by a narrow, poorly maintained road that is hazardous at best in bad weather. Due to these circumstances and in order to facilitate timely, effective self or aided rescue, the space must be designated as a permit-required confined space as required by the regulation. The purpose of the permit-required confined space designation is to provide worker entrants a minimal standard of protection for work in, and timely rescue from, a dangerous work environment.

Additionally, the confined space must also be evaluated for potential hazards that can be anticipated based upon changes the work activity can create inside the space. The employers were aware of hazardous work activities (welding, sandblasting, coating, walking/working on uneven surfaces, etc) and of added hazards brought into the confined space (electrical lines, gasoline powered 4-wheeled vehicle, cleaning solvents, etc.). The gasoline-fueled motor in the vehicle brought into the space had caused previous evacuations due to high levels of carbon monoxide from the vehicle's exhaust. Additionally, dangerous cleaning solvents were brought into the space during the coating operations. These hazards would increase the danger to entrants to the point of creating an Immediately Dangerous to Life and Health environment inside the space. Stand-by rescue protection for confined-space entrants into the water pipe was the only viable rescue option. A properly trained, equipped, and evaluated rescue service performing stand-by rescue had the time to rescue the five employees. The employers did not designate the water pipe as a permit-required confined space, did not post danger, permit-required confined-space signs, or worn their respective workforces of the existing, as well as the potential, hazards within the space. The employers' failures did not provide the safety net of a permit system and proper rescue when needed.

Another result of the employers' failure to comply was in the designation of an appropriate rescue service for the entry team. The host employer told contractor employees that the host would be responsible for summoning rescue and emergency services. Thus the host employer assumed the responsibility of selecting what rescue service was to be called as well as when and how the rescue service was to be summoned. Based upon rescue service member statements, the host did not have an arrangement with the volunteer service to serve as a confined-space rescue service. Instead the host merely called 911—which does not comply with the regulation. The rescue service summoned had not practiced simulated rescues from the water pipe, nor had been evaluated, as required by the regulation. Further, the employers did not afford the service access

to the water pipe in order to develop rescue procedures and specific techniques. The volunteer department, to its credit, even had requested such access to run rescue drills just in case they were ever called upon. Coordination with the rescue service is required by the regulation and vital to safety preparation. In fact, because there was no prior rescue plan developed, none of the emergency response agencies that responded to the incident were properly prepared to make a rescue, particularly from the upper portion of the water pipe which was one of the two rescue points of access and egress for victims. The regulation requires the employer to perform a two-part evaluation of a prospective rescue service to determine if the service is trained, equipped, and can respond to the employer's site in a timely manner. OSHA expects the service to respond to a non-immediately dangerous to life and health confined-space emergency scene and be prepared for a rescue entry in approximately 15 minutes. However, the circumstances of the water pipe entry required **rescue stand-by** rather than **rescue response**. Additionally, the service must be evaluated for rescue capabilities—in effect, is the service capable of actually performing a rescue operation safely and effectively from the employer's confined space? And the employer must determine if the rescue service has practiced simulated or actual rescues to a point of proficiency from the type of confined space the employer is entering. The responding rescue services on the day of the incident made every effort to effect a rescue of the five trapped workers. They entered a smoke-filled lower water pipe to try to get to the workers, but were thwarted by the blinding smoke. The services did not have the appropriate rescue equipment and respiratory equipment to attempt a rescue entry from the upper level entry point – the drained reservoir facility. While there were members of the fire department who were familiar with the layout of the site, none of the responding services had been informed of the hazards and obstacles they would encounter that day. No employers had informed the services of the work that was to be performed (and the corresponding hazards associated with that work) prior to initial entry into the water pipe.

However, a properly trained and equipped rescue team could have quickly accessed the workers with life-saving respiratory equipment. The workers could have then been lifted out of the upper level of the water pipe or, if provided respiratory equipment, possibly could have sat out the fire and waited for the smoke to be cleared before walking out the lower end with the rescuers. A qualified service would have notified the employers that the extreme remoteness of the facility would make a timely response (respond and be ready for rescue entry within approximately 15 minutes) difficult to impossible. That fact combined with the long distance a victim may have to be evacuated, and upon learning of the acute hazards entrants were faced with, the rescue service would have notified the employers that rescue stand-by was required throughout entry operations. A qualified team would have been prepared to make rescue entry from both the upper and lower entrances into the water pipe.

Additionally, trained rescuers are familiar with OSHA's intent (as stated in the preamble to the regulation) that confined-space rescue should follow a hierarchy or structured order for entrant protection. The first level of protection is the permit program itself in that it identifies the hazards, controls, and safety measures necessary to make a safe entry. The second level of

protection is self-rescue which is taught in confined-space entrant training. Although not feasible in this situation, the third level of protection is external retrieval of entrants via a lifeline attached to the entrant and attached outside the space. The final level of protection is rescue entry which, again, was not provided for by the employers.

## **OSHA Enforcement Strategy**

OSHA is responsible for some seven million workplaces in the United States. Obviously it cannot inspect every worksite every year. So the agency sets priorities as to what sites get their most acute attention. The number one priority is “imminent danger situations” that involve hazards that can cause death or serious physical harm. For this reason confined spaces has remained a high priority for the last several years. Historically, OSHA enforcement action primarily results in civil penalties involving fines that fall in a hierarchy from “other than serious” up to “willful” “repeated” transgressions, and “failure to abate.” However, the author is aware of confined-space fatality cases that either a local district attorney decided to criminally prosecute or the U.S. Department of Justice through district U.S. Attorney Offices filed charges against specific employer managers. Obviously, when safety infractions are amplified from civil up to criminal (and the implication of serving time in jail) status, it stands to reason that more employers are going to pay closer attention to their safety responsibilities.