



Case Study: The PEPCON Disaster

Course Number: ET-02-202

PDH: 2

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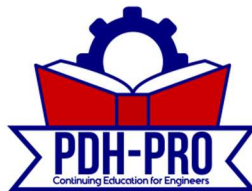
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The PEPCON facility before the blasts

Summary of the Disaster

Just before lunchtime on May 4th, 1988, at a facility near Henderson, Nevada, a panicked maintenance crew could be seen dashing away from the site of the *Pacific Engineering Production Company*, also known as PEPCON. Behind them, a moderate but ambitious-looking fire was establishing itself in a large storage lot.

The crew had been repairing a wind-damaged steel-and-fiberglass building when a stray spark from their welder somehow managed to set fire to the structure. The men fetched some nearby water hoses and attempted to douse the flames, but the flourishing fire mocked their efforts, and soon began to fondle the 55-gallon drums stored nearby. With this alarming development, the crew abandoned their hoses and gave up the fight in favor of a hasty departure. The workers knew exactly what was in these barrels, and they didn't wish to be present to observe how it would react to the flames.

At that time, PEPCON was one of the only US producers of the chemical *ammonium perchlorate*, a key ingredient in the rocket fuel used for space shuttle boosters and Titan missiles. This white granular compound is a powerful oxidizer, and its purpose is to accelerate rocket fuel combustion. Also present at the facility were bulk quantities of other hazardous materials used in manufacturing, such as hydrochloric acid and nitric acid.

Over four thousand tons of ammonium perchlorate were in the storage area that day, so the anxiety-stricken workers fled with great enthusiasm. The Challenger explosion fifteen months earlier had prompted NASA to freeze the space shuttle program pending investigation, yet the United States government continued to contract PEPCON at pre-Challenger quantities. Consequently, the containers full of the unused fuel component had slowly accumulated, making the site pregnant with stored energy.

Over the years, the entire facility had become peppered with residue from the ammonium perchlorate. Stiff winds on the day of the maintenance workers' visit conspired against them, and quickly turned a small welding accident into a brilliant orange fireball. As news of the fire spread, most of the employees rushed to evacuate the six buildings, but a man named Roy Westerfield stayed behind and called 911:

Dispatcher: Fire department.

Westerfield: Emergency. We need the fire department, all you can get here. Immediately.

Dispatcher: What's the problem?

Westerfield: Oh, we've got... everything's on fire.



PEPCON site ablaze

At about the same time, the chief of the Clark County Fire Department noticed the column of smoke on the horizon, and ordered his units to go to the location immediately. He and a passenger climbed into his car and raced to the scene ahead of the fire trucks. The intense fireball became visible from about a mile away, belching its column of acrid smoke into the sky.

Soon the pair began to see dozens of fear-stricken PEPCON employees on the roadsides; men and women hurrying away from the burning facility on foot in spite of the mid-day desert heat.

A few minutes later, as the chief neared the cluster of flaming buildings, he and his passenger were blinded by an abrupt flash. The car rocked and windows exploded as the vehicle was slammed by a deafening shock wave. As the explosion's echoes slowly faded, the fire chief stopped the car to assess the situation and tend to a few cuts caused by the hail of broken glass. Moments later a badly damaged vehicle approached from the direction of the plant, and its driver paused alongside the chief just long enough to warn him that the worst of the explosions were probably yet to come. Realizing that the inferno had grown far beyond his department's fire-suppression capabilities, the chief turned his car around and headed back towards Henderson.

The fire engine crews had reached the same dismal conclusion when they observed the explosion during their approach. It was clear that there were serious safety concerns in moving any closer, so the firefighters pulled their trucks off the road about a mile from the disaster-in-progress, and watched the towering flames from afar.

A mile away in another direction, an engineering crew had been performing routine maintenance on a television tower on Black Mountain when they spotted the fire and began filming. About four minutes after the first major explosion, the engineers watched in awe as the PEPCON site completely disappeared in a spectacular burst of energy that dwarfed the initial blast.



The fire at the PEPCON plant following the second explosion

Their vantage point afforded them a perfect view of the compression wave as it recklessly radiated across the desert, mowing down brush and demolishing a marshmallow factory adjacent to PEPCON. Due to the distance the sound of the blast didn't reach them for several seconds... but when it did, it was thunderous.

The Clark County fire chief was still trying to put distance between himself and the facility when the violent detonation struck. The blast wave swept in rapidly from behind and clobbered his wounded car, momentarily smothering him in an avalanche of noise and pressure. When the moment passed, he was astonished to find that the vehicle was still somewhat operational in spite of the significant bruising. He continued his retreat and eventually limped his injured automobile past the columns of idling fire engines, their pulverized windows littering the roadway. By the time he reached town and found his way to the hospital there were already hundreds of people gathered there awaiting treatment. The explosion one and a half miles away had dislodged parts of buildings and shattered windows in town, causing many instances of trauma and lacerations.

On the horizon, a plume of smoke rose 1,000 feet into the sky, and the column was said to be visible from as far as one hundred miles away. Some distant observers reportedly wondered whether this mushroom cloud indicated that the long-running Cold War had finally progressed into the Hot War that Americans feared.

The frenzied inferno at PEPCON finally calmed once the explosions had consumed the majority of the fuel. The cataclysmic blasts had ripped a hole in the ground and ruptured a gas line, but the resulting 200-foot-tall flame was easily starved to death by shutting off the gas feed from a station a mile away. Investigators arrived to survey the damage, and they found utter devastation. PEPCON's six buildings were totally destroyed, and where they had stood was nothing but twisted metal and a fifteen-foot-deep crater. The neighboring marshmallow factory fared no better, having been unable to absorb the incredible pressure wave. Many structures in Henderson also suffered damage, mostly in the form of shattered windows, cracked walls, and doors that were blown from their hinges. Some buildings as far as ten miles away were affected.



Roy Westerfield

Though there were almost 400 injuries reported— both from ground zero and from Henderson residents— surprisingly there were only two deaths. One was a worker confined to a wheelchair who had been unable to exit from the PEPCON building quickly enough. The other was Roy Westerfield, the very man who had made the original 911 call. He had been handicapped by the effects of polio, leaving him unable to walk very well. It is generally believed that he opted to stay behind and alert the authorities, knowing that escape was unlikely.

Further investigation into the event found that the destructive energy from the larger explosion was roughly equivalent to 1,000 tons of TNT, or one kiloton. It caused seismograph needles to



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