

The Texas City Disaster

The National Hazardous Materials Fusion Center offers *Hazmat History* as an avenue for responders to learn from the past and apply those lessons learned to future incidents for a more successful outcome. This coincides with the overarching mission of the Fusion Center – to improve hazmat responder safety and enhance the decision-making process during pre-planning and mitigation of hazmat incidents.

Incident Details:

Location and Date

Texas City, TX April 16, 1947

Hazardous Material Involved

Ammonium Nitrate Fertilizer

Type (mode of transportation, fixed facility)

Cargo Ship

Overview

The morning of 16 April 1947 dawned clear and crisp, cooled by a brisk north wind. Just before 8 am, longshoremen removed the hatch covers on Hold 4 of the French Liberty ship *Grandcamp* as they prepared to load the remainder of a consignment of ammonium nitrate fertilizer. Some 2,086 mt (2,300 t) were already onboard, 798 (880) of which were in the lower part of Hold 4. The remainder of the ship's cargo consisted of large balls of sisal twine, peanuts, drilling equipment, tobacco, cotton, and a few cases of small ammunition. No special safety precautions were in focus at the time.

Several longshoremen descended into the hold and waited for the first pallets holding the 45 kg (100 lb) packages to be hoisted from dockside. Soon thereafter, someone smelled smoke, a plume was observed rising between the cargo holds and the ship's hull, apparently about seven or eight layers of sacks down. Neither a 3.8 L (1 gal) jug of drinking water nor the contents of two fire extinguishers supplied by crew members seemed to do much good. As the fire continued to grow, someone

lowered a fire hose, but the water was not turned on. Since the area was filling fast with smoke, the longshoremen were ordered out of the hold.

While Leonard Boswell, the gang foreman, and Peter Suderman, superintendent of stevedores, discussed what action to take, the master, or captain, of the *Grandcamp* appeared and stated in intelligible English that he did not want to put out the fire with water because it would ruin the cargo. Instead, he elected to suppress the flames by having the hatches battened and covered with tarpaulins, the ventilators closed, and the steam system turned on. At the masters' request, stevedores started removing cases of small arms ammunition from Hold 5 as a precautionary measure. As the fire grew, the increased heat forced the stevedores and some crew members to leave the ship. The *Grandcamp's* whistle sounded an alarm that was quickly echoed by the siren of the Texas City Terminal Railway Company. Despite a strike by the telephone workers, Suderman, seriously concerned by now, managed to reach the Fire Department and then called Galveston for a fire boat.

It was now about 8:30. At this point, growing pressure from the compressed steam fed into Hold 4 blew off the hatch covers, and a thick column of orange smoke billowed into the morning sky. Attracted by its unusual color and the sirens, several hundred onlookers began gathering a few hundred feet away at the head of the ship. Twenty-six men and the four trucks of the Volunteer Fire Department, followed by the Republic Oil Refining Company fire-fighting team, arrived on the scene and set up their hoses. A photograph taken at approximately 8:45 shows at least one stream playing on the deck of the *Grandcamp*, which was apparently hot enough to vaporize the water.

Around 9:00, flames erupted from the open hatch, with smoke variously described as "a pretty gold, yellow color" or as "orange smoke in the morning sunlight...beautiful to see." Twelve minutes later, the *Grandcamp* disintegrated in a prodigious explosion heard as far as 241 km (150 mi) distant. A huge mushroom like cloud billowed more than 610 m (2,000 ft) into the morning air, the shockwave knocking two light planes flying overhead out of the sky. A thick curtain of steel shards scythed through workers along the docks and a crowd of curious onlookers who had gathered at the head of the slip at which the ship was moored. Blast over pressure and heat disintegrated the bodies of the firefighters and ship's crew still on board. At the Monsanto plant, located across the slip, 145 of 450 shift workers perished. A four and a half meter (fifteen foot) wave of water thrust from the slip by the force of the blast swept a large steel barge ashore and carried dead and injured persons back into the turning basin as it receded. Fragments of the *Grandcamp*, some weighing several tons, showered down throughout the port and town for several minutes, extending the range of casualties and property damage well into the business district, about a mile away. Falling shrapnel bombarded buildings and oil storage tanks at nearby refineries, ripping open pipes and tanks of flammable liquids and starting numerous fires. After the shrapnel, flaming balls of sisal and cotton from the ship's cargo fell out of the sky, adding to the growing conflagration.

The sheer power of the explosion and the towering cloud of black smoke billowing into the sky told everyone within thirty-two kilometers (twenty miles) that something terrible had happened. People on the street in Galveston were thrown to the pavement, and glass store fronts shattered. Buildings swayed in Baytown twenty-four kilometers (fifteen miles) to the north. The towering smoke column served as a grim beacon for motorists driving along the Houston-Galveston highway, some of whom immediately turned toward Texas City to help. In Texas City itself, stunned townspeople who started toward the docks soon encountered wounded persons staggering out of the swirling vortex of smoke

and flame, most covered with a thick coat of black, oily water. Many agonizing hours were to pass before a semblance of order began to replace the shock and confusion caused by this totally unexpected and devastating event.

The horror was not over yet. As help poured into Texas City, no one gave much thought to another Liberty ship tied up in the adjoining slip. The *High Flyer* was loaded with sulfur as well as a thousand tons of ammonium nitrate fertilizer. The force of the *Grandcamp's* explosion had torn the *High Flyer* from its moorings and caused it to drift across the slip, where it lodged against another vessel, the *Wilson B. Keene*. The *High Flyer* was severely damaged, but many of its crew members, although injured, remained on board for about an hour until the thick, oily smoke and sulfur fumes drifting across the waterfront forced the master to abandon ship. Much later in the afternoon, two men looking for casualties boarded the *High Flyer* and noticed flames coming from one of the holds. Although they reported this to someone at the waterfront, several more hours passed before anyone understood the significance of this situation and not until 11:00 pm did tugs manned by volunteers arrive from Galveston to pull the burning ship away from the docks. Even though a boarding party cut the anchor chain, the tugs were unable to extract the ship from the slip. By 1:00 am on April 17th, flames were shooting out of the hold. The tugs retrieved the boarders, severed tow lines, and moved quickly out of the slip. Ten minutes later, the *High Flyer* exploded in a blast witnesses thought even more powerful than that of the *Grandcamp*. Although casualties were light because rescue personnel had evacuated the dock area, the blast compounded already severe property damage. In what witnesses described as something resembling a fireworks display, incandescent chunks of steel which had been the ship arched high into the night sky and fell over a wide radius, starting numerous fires. Crude oil tanks burst into flames, and a chain reaction spread fires to other structures previously spared damage. When dawn arrived, large columns of thick, black smoke were visible thirty miles away. These clouds hovered over Texas City for days until the fires gradually burned out or were extinguished by weary fire-fighting crews.

Lessons Learned/Smart Practices

Although today ammonium nitrate is more readily known not just as a fertilizer and explosive compound, but as a weapon of mass destruction. After the Oklahoma City Bombing, first responders have been training on the threats associated with ammonium nitrate fuel oil (ANFO) and the devastation it is capable of. However, we need to remember that ammonium nitrate is a common fertilizer transported, stored and used across the country and when used inappropriately or mixed or even stored with the wrong chemicals or compounds it can be disastrous.

- Always treat any scene with ammonium nitrate, or any other explosive compound, as just that, an explosive device.
- First responders do not have the appropriate PPE to protect ourselves from any energetic material.
- The best course of action is to evacuate the area and isolate the scene and call for help.
- A review of the Emergency Response Guide Book (ERG) will help guide you to making the appropriate decisions. In an incident like this one, the ERG says to evacuate a ½ mile for a rail

car involved in fire; this container of course held a lot more than a rail car. Remember, it is always easier to make the scene smaller later, rather than having to back up!



For more photos:

http://www.google.com/images?q=texas+city+disaster&rls=com.microsoft:en-us:IE-SearchBox&oe=UTF-8&rlz=1I7SUNA_en&um=1&ie=UTF-8&source=univ&sa=X&ei=pM5rTc9bhPazA5zg1aYE&ved=0CD8QsAQ



