Tucson Fire Department
July 5, 1973 Kingman Explosion
Doxol Disaster
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Kingman, AZ Tank Car Explodes In Town, July 1973

Submitted by Stu Beitler on 25 June 2008 - 4:57pm
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4 DIE, 70 HURT IN KINGMAN GAS BLAST.

Kingman, Ariz. (AP) -- "Suddenly the tank exploded and the air was filled 200 feet high with burning material," said Fire Chief CHARLES POTTER after a railroad tank car filled with propane gas caught fire and exploded here. The explosion, and fire Thursday killed three fireman instantly and injured 70 other persons. A fourth critically burned person died shortly before 11 a.m. EDT at a Phoenix hospital. His name was withheld pending notification of kin. Twenty-five persons were hospitalized.

The fire blocked east-west highway and railroad traffic, destroyed two buildings and damaged three others in this northwest Arizona town. The propane gas exploded minutes after firemen began fighting a small blaze in the tank car. Flames and metal shreds were showered over adjoining buildings, lawns and fields. The blast shoved the tank car a quarter of a mile and dug a crater 10 feet deep.

"All that fire," said Capt. JOHN HOWELL. "It seemed to last an eternity, but I supposed it lasted 30 seconds."

The accident occurred on a siding of the Santa Fe Railroad, which parallels U.S. 66 through the town. Authorities said the propane apparently was being unloaded at the time. Two of the dead, ROGER HUBKA and BILL CASSON, were Kingman volunteer firemen. The third, JIMMY COX, was an assistant chief. The flames set numerous brush fires in addition to burning the office of Doxel Suburban Gas Co., destination of the gas, two service stations, a beer warehouse and a small supermarket.

The victims jammed the Mohave County General Hospital. Planes and helicopters flew the most seriously burned victims to hospitals at Phoenix, 175 miles to the southeast, and Las Vegas, Nev., 100 miles to the northwest. Slurry bombers, stationed here by the Bureau of Land Management to fight range fires, dumped fire retardant mixtures on the flames which spread across the highway. Helicopters were sent by the highway patrol and two Air Force bases.

State Fire Marshal ROBERT J. ROSS traveled to Kingman to investigate the explosion and fire.

Among those hospitalized were father-and-son firefighters HUGH T. STRINGER, 50, and ARTHUR STRINGER, 24, both of Kingman. A spokesman at Southern Nevada Memorial Hospital in Las Vegas said both were in very critical condition with third degree burns over most of their bodies.

Maricopa County Hospital officials in Phoenix said MARVIN MAST, 42, JOE CHAMBERS, 37, manager of Doxel gas, and ALLEN HANSEN, 34, of the Arizona Highway Patrol, were hospitalized.

Arizona Daily Sun Flagstaff 1973-07-06
July 5, 1973 Kingman Explosion——Doxol Disaster

Kingman, AZ Tank Car Explodes In Town, July 1973

KINGMAN TOLL HITS 6.

Kingman, Ariz (AP) -- The death toll has risen to six in Thursday's explosion of a propane tank car which rocked this western Arizona community of 7,000. More than 70 others were injured, and seven remained in critical condition today, hospital spokesmen said.

Among those remaining in critical condition is RICHARD LEE WILLIAMS, who was burned over 70 per cent of his body.

The 42-year-old principal of Kingman High School earned his B.S. degree in education from Northern Arizona University in 1949 and his master's degree in 1961. He was a letterman in NAU in basketball and football in 1948-49. His wife is the former JEANNIE FLYNN of Flagstaff.

ARTHUR STRINGER, 24, a volunteer fireman from Kingman, was the latest to die. A spokesman at Southern Memorial Nevada Hospital in Las Vegas said STRINGER, who had suffered burns over 100 per cent of his body, died late Friday night. His father, HUGH T. STRINGER, 50, also a volunteer fireman, was one of those listed in critical condition.

MARVIN MAST, 42, and JOE CHAMBERS, 37, both of Kingman, died earlier Friday of burns received in the blast which rocked this western Arizona town of 7,000. Killed instantly were ROGER HUBKA, 27, BILL CASSON, 52, and JIMMY COX, 55, all of Kingman.

"This is a small town, and everybody's affected. It's horrible, everybody knows everybody. Everybody knows the guys in the volunteer fire department," said Kingman native JAY GATES III.

GEORGE DEMPSEY, executive director of the Arizona Corporation Commission, said it appeared the blast resulted from a failure in a release valve as the propane was being transferred from the tank car to trucks. The Doxel Suburban Gas Co., where the accident occurred, was demolished and two other buildings were damaged.

DEMPSEY said a Federal Railroad Administration explosive expert was at work trying to reconstruct the circumstances of the blast.

"We won't really know what happened until his investigation is complete," said DEMPSEY.

Arizona Daily Sun Flagstaff 1973-07-07
July 5, 1973 Kingman Explosion——Doxol Disaster


Kingman explosion killed 11 firefighters July 5, 1973

Posted: Jul 05, 2013 6:29 PM
Updated: Jul 19, 2013 7:53 PM
By Jason Barry

KINGMAN, AZ (CBSS) - It was a 33,000 gallon railroad car full of propane that burst into flames near the center of town, and changed the community of Kingman forever.

"I think about it all the time," said Casson. "It sticks with me. It's still very vivid in my mind. My mom took over the responsibilities of taking care of all of us. She was a saint, and helped us all get through this thing and carry on with our lives. The kind of person he was, had a lot to do with who I became, and who I am."

Most of the firefighters killed that day were volunteers, well entrenched within the community, a high school principal, state policeman, local business owners.

The tragedy left a lot of children to grow up without a father.

A gas company worker was also killed, and more than 100 people injured.

Kingman Fire Chief Chuck Osterman said that seeing what happened at the Yarnell Hill fire this week, where 19 firefighters died, brought back a lot of tough memories.

"Obviously, for those of us that were affected by the tragedy 40 years ago, you immediately feel and know how the community of Prescott is feeling, because we went through it," said Osterman. "I think it was surreal that it happened in that time frame, but extremely impact for us."

A special ceremony will be held Friday night at 6pm, at Firefighter Memorial Park in Kingman, to honor the firefighters who lost their lives 40 years ago Friday.

Their loved ones may be gone, but will never be forgotten.

"As each year goes by, it certainly eases the pain a little bit," said Casson.

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The Disaster Story

On July 5, 1973, Kingman was the site of a catastrophic BLEVE (Boiling Liquid Expanding Vapor Explosion) which killed 11 firefighters. The explosion occurred following a fire that broke out as propane was being transferred from a railroad car to a storage tank. This explosion has become a classic incident studied in fire department training programs worldwide.

Tank car #38214 was setting on a spur in the hot sun that the Williams Energy Company leased from the Santa Fe Railroad. The car carried 33,000 gallons of propane gas which was to be transferred to storage tanks 75 yards away.

This was at the Doxol Gas Western Energy Co. bulk plant (2512 East Highway 66), in the Hilltop business district on Kingman's southeast side. Employees of the Williams Energy Company, began opening the tank car's valves to transfer its load into smaller storage tanks in the company yard.

A leak was detected in one of the fittings and an attempt was made to correct it by striking the fitting with a large wrench. The gas ignited and turned the tank car into a huge blowtorch enveloping the two men. Flames shot 70 to 80 feet in the air in a V-shape.

The two men jumped or fell off the car. One of them stumbled across the street, a quarter mile to the Highway Patrol office and stated his co-worker was still at the burning car.

A ten-man squad of the 75-man Kingman Volunteer Fire Department responded to the alarm and began spraying the car with water, hoping to keep the tank car cool and to prevent a pressure buildup inside it. Water won't extinguish burning propane, but the Kingman FD had no equipment which would, so all it could do was try to prevent an explosion.
It sounded like the thunderous roar of a jet airliner taking off, the tank car quieted for a second, sucked the huge column of flames down into it, swelled up and popped like a giant champagne cork. Two more times the flames vanished into the car and popped out. By this time one of the large transfer hoses was sending burning propane against the side of the tank car.

A large crowd of spectators congregated along Route 66 which separated them from the burning tank car by nothing but less than two hundred yards of open desert. Kingman police and Arizona Highway patrolmen were establishing roadblocks 1,000 feet from the fire. Two minutes before two o’clock, just as an order to move people farther back was given, the tank car exploded.

The Kingman explosion sent debris and flames up to 2,000 feet away with the three-ton end of the half-inch-thick metal tanker landing a quarter mile down the tracks. There was a crater 10 feet deep left where the tank car had been sitting.

Flaming propane sprayed by the explosion along with falling debris from this cloud, ignited several buildings in the vicinity. The victims jammed the Mohave County General Hospital. Planes and helicopters flew the most seriously burned victims to hospitals at Phoenix, 175 miles to the southeast, and Las Vegas, Nev., 100 miles to the northwest.

Slurry bombers, stationed here by the Bureau of Land Management to fight range fires, dumped fire retardant mixtures on the flames which spread across the highway. Helicopters were sent by the highway patrol and two Air Force bases.

The scene of the fire was highly visible to most of the town’s residents. A radio station’s news flash and the fire department’s siren probably drew more spectators to the scene than would have otherwise come out of mere curiosity. Mohave County Sheriff’s Office, Department of Public Safety, and Arizona Game and Fish personnel were joined by private citizens in sealing off the fire area and rerouting the massive traffic.

Mohave General Hospital received 107 casualties from the explosion by way of the one ambulance, private cars, police cars, and anything else available. Security at the hospital was to have been provided by outside personnel as well -- but many of these were themselves, being treated for injuries or worse.
Spectators and visitors gathered both outside the emergency department and inside the treatment area. Due to the severe injuries there was an executive decision made to let the loved ones be allowed inside with the patients. The hospital was an unbelievable sight. The corridors were full of burn victims, families, doctors, and nurses.

Total material damage exceeded one million dollars. Everything for three to four hundred feet from the tank car's location was black and charred. After the explosion, the fire code became an instant issue. Essentially, all the new ordinance did was require all bulk storage tanks to be diked and to have some kind of foam fire extinguisher system.

The ones in town that were moved, were provided an area out by the airport. Spur tracks like the one the explosion happened on, were to be sunk so that those cars would be in a pit. If they exploded, the pit would force the blast upward so it wouldn't cause as much damage.

As a result of the Kingman disaster, standard procedures for handling a BLEVE now became well-known in fire departments throughout the country. Films and pictures taken at the disaster are part of the training course.

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Ironically, a seminar had been scheduled for Kingman on July 11 (6 days after the fire), to discuss "dangerous cargo spillage."

In 2010 the area of the explosion was still vacant.
July 5, 1973 Kingman Explosion——Doxol Disaster


Eleven Kingman firefighters and a gas-company worker died, more than 100 other people were injured, buildings were flattened and fires broke out everywhere. Dying firefighters whispered last words to wives, who would soon be widows, and children, who would grow up without fathers.

WHEN I AM CALLED TO DUTY, GOD, WHEREEVER FLAMES MAY RAGE, GIVE ME THE STRENGTH TO SAVE SOME LIFE WHATEVER THE AGE, HELP ME EMBRACE A LITTLE CHILD BEFORE IT IS TOO LATE, OR SAVE AN OLDER PERSON FROM THE HORROR OF THAT FLAME. ENABE ME TO BE ALERT AND HEAR THE WEAKEST SHOUT AND QUICKLY AND EFFICIENTLY TO PUT THE FIRE OUT. I WANT TO FILL MY CALLING AND TO GIVE THE BEST IN ME, TO GUARD MY EVERY NEIGHBOR AND PROTECT HIS PROPERTY, AND IF ACCORDING TO MY FATE I AM TO LOSE MY LIFE PLEASE BLESS WITH YOUR PROTECTING HAND MY CHILDREN AND MY WIFE.

Donald Webb

Jimmy Cox

Joseph Chambers

Roger Hubka

John Campbell

Frank (Butch) Henry
<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>William L. Casson</td>
<td>52</td>
<td>Volunteer fire captain (former fire chief), 27-year veteran fireman, regional manager for Citizens' Utilities Co., a director of the Kingman Chamber of Commerce, and a 31-year member of the Elks</td>
</tr>
<tr>
<td>Myron B. (Jimmy) Cox</td>
<td>55</td>
<td>Assistant fire chief, 22-year veteran fireman, driver for Kingman Bake Shop, a member of the city planning and zoning commission, piano player, and a long-time member of the Elks</td>
</tr>
<tr>
<td>Roger A. Hubka</td>
<td>27</td>
<td>Volunteer fireman, service manager for Double G Tire Co. (one of the companies that was totally destroyed), and a Pop Warner football coach</td>
</tr>
<tr>
<td>Joseph M. Chambers III</td>
<td>37</td>
<td>16-year veteran volunteer lieutenant fireman, a member of the Elks, and one of the organizers of Kingman's original Jaycees chapter</td>
</tr>
<tr>
<td>Marvin E. Mast</td>
<td>42</td>
<td>Manager of Doxol Gas Co., Korean War veteran, and member of a Moose Lodge in Illinois where he lived up to 1972</td>
</tr>
<tr>
<td>Arthur C. Stringer</td>
<td>25</td>
<td>Vietnam veteran and member of the Arizona national Guard, and a volunteer fireman for one month. His father, also a volunteer fireman, was seriously burned.</td>
</tr>
<tr>
<td>Christopher G. Sanders</td>
<td>38</td>
<td>Certified first aid instructor, and executive director of Mohave Big Brothers. He had loaded others into an ambulance before evacuating himself from the scene and helped a newspaper reporter drive the vehicle to the hospital with victims burnt less severely than he was.</td>
</tr>
<tr>
<td>Richard Lee Williams</td>
<td>47</td>
<td>Volunteer fireman and principal of the Kingman High School since 1959, coach there 1949-1955, member of the Elks and American Legion and a Rotarian.</td>
</tr>
<tr>
<td>Frank S. (Butch) Henry</td>
<td>28</td>
<td>7-year volunteer fireman and manager of ICX truck lines.</td>
</tr>
<tr>
<td>John O. Campbell</td>
<td>41</td>
<td>Volunteer fireman, head of the Kingman Water Department, assistant city works director. He was also a Little League manager who died on the eve of the opening of a Little League tournament.</td>
</tr>
<tr>
<td>Donald G. Webb</td>
<td>38</td>
<td>Volunteer fireman, gas station owner, Elks official and Rotarian.</td>
</tr>
<tr>
<td>Alan Hansen</td>
<td>34</td>
<td>Arizona highway patrolman and a fireman, suffered burns over 50 percent of his body trying to help an unconscious fireman.</td>
</tr>
</tbody>
</table>
July 5, 1973 Kingman Explosion——Doxol Disaster

Ninety-nine others, most of them spectators who had gathered along Highway 66, were injured by the explosion. It was a sad day in Kingman, AZ.

Firefighters from all over the world have used the Kingman event as a case study. Fire experts call that type of incident a Boiling Liquid Expanding Vapor Explosion, or BLEVE. Firefighters make pilgrimages to Kingman to see the site of the explosion and hear the breakdown of what happened.

The 'Largest firefighter disaster in Arizona’s history' is now memorialized at the park.
July 5, 1973 Kingman Explosion——Doxol Disaster
Courtesy—http://kingmanhistoricdistrict.com/points-of-interest/firefighters-memorial-park/the-memorial.htm
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Courtesy—http://kingmanhistoricdistrict.com/points-of-interest/firefighters-memorial-park/the-memorial.htm
The following slides were made available from the TFD—Public Training Academy.

The slides are not in any particular order, they have been stored for years and mixed up over the years.
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The purpose of this case study is to describe the events leading up to and the possible consequences of a liquefied petroleum gas tank fire and rupture.

LP GAS EXPLOSION
KINGMAN, ARIZONA
JULY 5, 1973
A CASE STUDY

NFPA®
July 5, 1973 Kingman Explosion——Doxol Disaster
July 5, 1973 Kingman Explosion——Doxol Disaster
SUMMARY
1. Preplan those emergencies that you can.
2. If circumstances permit, DO NOT FIGHT THE FIRE. Consider 3,000 feet as the hazard area if tank cars, tank trucks or large storage tanks are involved.

3. Consider personnel safety at all times:
   a. Approach from the sides of containers.
   b. Provide wide angle water spray protection for men during initial setup.
   c. Use all available barriers to protect against flying missiles and thermal radiation.
   d. Use unmanned equipment where feasible.
   e. Maintain observation of areas of flame contact and water application.
   f. Be sure water supplies and application rates are adequate. Large containers require at least 500 gpm for several hours.

4. Know and practice tactics discussed in the NFPA motion picture and slide set "Handling LP-Gas Emergencies."
July 5, 1973 Kingman Explosion——Doxol Disaster
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July 5, 1973 Kingman Explosion — Doxol Disaster
Kingman, Arizona

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
Kingman, Arizona  July 5, 1973

Hazardous Material Involved
Propane

Type (mode of transportation, fixed facility)
Railroad Tank Car

Overview
On Thursday July 5th, 1973 at approximately 1:30 pm, two employees of Droxol Propane were in the process of off-loading the contents of the 127 kl (33,500 gal) railroad tank car into two propane storage tanks. When the valves were opened, one of the connections was discovered to be leaking. One of the employees attempted to stop the leak. It is believed that the employee somehow generated a spark that ignited the leaking propane. Both of the employees were either knocked down or fell from the tank car. One of the employees was able to stumble across the street to the Highway Patrol Office to ask for help.

In 1973 the Kingman Fire Department was a combination of 6 career firefighters and 36 volunteers operating out of two stations. Equipment in service at the time consisted of 4 engines and a rescue vehicle. Station 2 was located just 800 m (.5 mi) west of the Droxol Gas Distribution Plant.
Kingman Firefighters received the first call for help at 1:57 pm and arrived on the scene three minutes later. Knowing that they were not properly equipped to extinguish the fire, they attempted to keep the tank cool to avoid an explosion. Police officers from Kingman, officers from the Highway Patrol and deputies from the Sheriff’s Office began blocking the roads in an effort to control the gathering crowd. Members of the Fire Department were working to set up unmanned nozzles to increase the amount of water flowing onto the tank.

A large crowd of people had gathered across Route 66 with nothing more than about 185 m (200 yd) of desert separating them from the scene. Officers were ordering them to move back, while others were working to block traffic on the roadway and establish a perimeter around the scene.

The explosion occurred approximately 20 minutes after the original call was received. Flames and debris were sent over 600 m (2000 ft) away. The 2 ton end cap of the tank was propelled down the railroad spur approximately 400 m (.25 mi). The explosion left a 3 m (10 ft) deep crater were the tank once stood. Flaming propane and debris rained down on spectators and buildings in the area. Over 100 people received burns from the explosion, eleven firefighters and one civilian died, either immediately or within days of the incident. Several buildings in the immediate area were ignited by the burning propane, causing further problems to the incident.

Slurry bombers from the Bureau of Land Management, normally used to fight range fires, helicopters from the Highway Patrol, and helicopters from two air force bases joined in to fight the fires and help evacuate the injured. Over 100 casualties jammed the Mohave General Hospital, being transported by the one ambulance, police cars and private vehicles. The most severely burned victims were flown to hospitals in Phoenix about 282 km (175 mi) away or Las Vegas about 160 km (100 mi) in the opposite direction.

The explosion literally shook this tiny town of 7,500 and was reportedly felt up to 8 km (5 mi) away.

Lessons Learned/Smart Practices

- BLEVEs can be caused by an external fire near the storage vessel causing heating of the contents and pressure build-up. While tanks are often designed to withstand great pressure, constant heating can cause the metal to weaken and eventually fail. If the tank is being heated in an area where there is no liquid, it may rupture faster without the liquid to absorb the heat. Gas containers are usually equipped with relief valves that vent off excess pressure, but the tank can still fail if the pressure is not released quickly enough. If the substance involved is flammable, it is likely that the resulting cloud of the substance will ignite after the BLEVE has occurred.

- Using today’s training and resources, like the Emergency Response Guide Book (ERG), you would find that a container of this size involved in fire would require an evacuation of 1 mile
in all directions. Looking back at this scene, if this information and training was available then, many injuries and even live could have been saved.

A good “Rule of Thumb” is to flow at least 500 gallons per minute on the top of a container involved in fire for every point of fire impingement with un-attenuated master stream nozzles.

Additional Resources and Pictures

Kingman, Arizona
Sources


http://findarticles.com/p/articles/mi_hb4760/is_200809/ai_n32296414/

http://kingmanhistoricdistrict.com/points-of-interest/firefighters-memorial-park/the-disaster-story.htm

http://www.kingmanfire.com/pages/memorial/doxol.asp
Greater Tucson Fire Foundation

Thanks you for taking an interest in Tucson Fire Department history —

This is one of many sections that contain information, documents, letters, newspaper articles, pictures, etc. They have been collected and arranged in chronological order or by a subject. These items were collected, organized and entered into a computerized database by Dave Ridings Assistant Chief Tucson Fire Department, Al Ring friend of the department, Greater Tucson Fire Foundation and with the help of many friends and fellow firefighters.

All graphics have been improved to make the resolution as good as possible, but the reader should remember that many came from copies of old newspaper articles. This also applies to other items such as documents, letters, etc.

Credit to the source of the documents, photos, etc. is provided whenever it was available. We realize that many items are not identified and regret that we weren’t able to provide this information. As far as the newspaper articles that are not identified, 99% of them would have to be from one of three possible sources. The Arizona Daily Star, The Tucson Citizen and the Tucson Daily Citizen, for which we want to give a special thanks.

Please use this information as a reference tool only. If the reader uses any of the information for any purpose other than a reference tool, they should get permission from the source.

Should the reader have additional information on the above subject we would appreciate you sharing it with us. Please see the names and contact information on the 1st. TFD Archives page right below this paragraph.