

# **GREEN SHEET**

## **SACRAMENTO FIRE DEPARTMENT**

### **Informational Summary Report of Serious SFD Injuries, Illnesses, Accidents and Near-Miss Incidents**



**Natural Gas Explosion  
Burn Injuries**

**July 5, 2010**

**3820 25<sup>th</sup> Avenue**

**CA-SCR-22F10-034898**

A Board of Review has not approved this Summary Report. It is intended as a safety and training tool, an aid to preventing future occurrences, and to inform interested parties. Because it is published on a short time frame, the information contained herein is subject to revision as further investigation is conducted and additional information is developed.

## SUMMARY

On July 5, 2010 at 0947 BC2, E6, T6 and E56 were dispatched to 3820 25<sup>th</sup> Ave for an “odor of gas outside a residence with the gas meter spinning”. Approximately 5 minutes and 30 seconds after the arrival of the first company there was an explosion at the reported address. As a result of the explosion, four firefighters were transported to the hospital with first and second degree burns to their hands and face.

## CONDITIONS

Weather conditions as recorded by Weather Underground, observed on 07-05-10 at 09:53 am.

- Temperature: 72.0°F
- Dew Point: 53.1°F
- Humidity: 51%
- Visibility: 10.0 mi
- Wind: 4.6 mph SW
- Sky: Clear
- Barometer: 29.88 in
- Structure: Single Family Residence, 750 ft<sup>2</sup>, Type V Wood Frame Construction, Built 1926

## SEQUENCE OF EVENTS

On July 5<sup>th</sup>, 2010 at 0947 Battalion Chief 2 (BC2), Engine 6 (E6), Truck 6 (T6) and Engine 56 (E56) were dispatched to 3820 25<sup>th</sup> Avenue for an “odor of gas outside a residence with the gas meter spinning very fast”. T6 arrived on scene at **0951** and reported nothing visible from the exterior of a small, single story residential house, noted an odor of gas and assumed investigation mode. T6 Crew consisted of a Captain, an Engineer, and two Firefighters using the identifiers of Tools FF and Saw FF. Radio channel B6 was assigned as the incident tactical channel and B2 was used to communicate to the Dispatch Center.

While arriving on scene, T6 passed the Bravo, Alpha and Delta sides of the residence and positioned the truck in front of the Delta exposure structure. T6 Tools informed the Captain they would shut off the gas. T6 Tools and T6 Saw located the Pacific Gas & Electric (PG&E) gas meter on the Delta side of the building and turned off the gas at the service shutoff valve. After noting that there was no visible damage to the meter, T6 Saw made a radio transmission at **0952** to T6 Captain noting the gas was shutoff. T6 Saw joined by T6 Engineer moved to the Alpha side of the building, towards the Bravo side, trying to manually open windows. T6 Captain gave a report on conditions and proceeded to the Alpha side of the building.

T6 Captain was told by both civilians and T6 Saw that the residence was locked, the lock box was missing, and the owner was on the way. T6 Captain proceeded to the Bravo side of the building, heading towards the Charlie side. T6 Captain looked inside the building and noted that the building looked vacant and was recently remodeled. T6 Captain located the electrical panel on the Charlie side of the building and turned off the power.

E6 arrived on scene at **0952**, positioning the engine in front of the Bravo exposure structure. E6 Crew consists of a Captain, an Engineer, and two Firefighters using the identifiers of Nozzle FF and Backup FF. Due to the deep set back of the residence, E6 Captain gave the order to E6 Nozzle to pull the 200' 1 ¾" pre-connect line as a Protection Line; the line was extended to the Bravo side of the residence. E6 Backup was assisting with the stretch while E6 Nozzle organized the first 50' of the hose approximately 10-15' from the front door on the Bravo side of the building. E6 Engineer was at the rig preparing to charge the line.

E56 arrived on scene approximately three seconds after E6 and staged one block away at the fire hydrant located on the corner of Martin Luther King Blvd and 25<sup>th</sup> Ave. At **0953** T6 Captain made a radio transmission to BC2 that utilities were secured and to release E56 and continue PG&E; E56 changed their status to Available on the Radio (AOR) and drove past the incident as they returned to quarters. BC2 went AOR prior to arriving on scene.

With utilities secured, and confident that the building was vacant, the strategy that T6 Captain discussed with the crew was to continue to attempt to horizontally ventilate the building without causing damage and to wait for PG&E to arrive before entering the structure. T6 crew members attempted to horizontally ventilate the building by manually opening the windows. All windows were locked and it was noted that, because of the newer style vinyl windows, it would be difficult to access the window locks without causing damage. T6 Tools and T6 Saw then began working to open the front door located at the Bravo side near the Alpha corner. T6 Saw noted that the deadbolt mechanism was not actuated and the locked door knob handle was the only thing securing the door. The door was opened by T6 Tools applying pressure to the door with a shoulder while T6 Saw used a small, 6" personal nail bar to push back the latch on the door knob just enough to release the door from the jamb. Once the door was opened, the lack of resistance caused T6 Tools to enter the structure approximately three feet.

The explosion occurred within seconds of the door opening, at approximately **0956**. T6 Saw and T6 Tools both described a sound similar to a Bar-B-Q being lit. At the time of the explosion T6 Captain and T6 Engineer were positioned on the Delta side of the building, T6 Saw was just outside the threshold of the door located on the Bravo side and T6 Tools was inside the residence approximately three feet. E6 Captain was located on the Alpha Bravo corner approximately 10' from the building and facing away. E6 Nozzle was located 10-15' away from the Bravo wall almost directly in front of the Bravo door. E6 Backup was on the Bravo side approximately four to six feet behind T6 Saw and in front of E6 Nozzle. E6 Engineer was at the pump panel waiting to charge the hose line. E6 Nozzle and E6 Backup were both organizing the hose line that was not yet charged with water.

The Personal Protective Equipment worn by crew members was as follows, unless otherwise noted: structure helmet, hood, turnout coat, turnout pants with structure boots, and SCBA; none had their face piece donned. E6 Captain, E6 Backup, and T6 Captain had on their leather work gloves. E6 Nozzle did not have a hood donned. T6 Tools had on leather work gloves but took them off to assist T6 Saw with opening the door.

At **0956**, E6 Captain called a Mayday on tactical channel B6. Realizing that the only companies on B6 were Engine 6 and Truck 6, E6 Captain immediately went to command channel B2 and requested a full response to the scene due to an explosion and to add three Code-3 medic units. E56 was heading south on Martin Luther King Blvd. just north of Fruitridge Road and immediately returned to the scene.

Immediately after the explosion the Captains from E6 and T6 were able to locate all of their crew members and at **0958** E6 Captain reported that everybody was out of the house. The four injured firefighters were able to remove themselves from the debris and walk to E6. The non injured crew members from E6 and T6 began treatment of the injured firefighters.

E56 returned to the scene approximately one minute and thirty seconds after E6 Captain called the Mayday. E56 assumed fire attack at **0958**, extinguished the small amount of fire that was caused by the explosion, then assisted with treatment and transport of the injured firefighters. At **0959**, BC2 arrived on scene and assumed 25<sup>th</sup> Ave. Command. By approximately **1005**, all four of the injured firefighters had been transported to the hospital.

## INJURIES/DAMAGES

Engine 6 Nozzle - First and second degree burns to face and neck. Second and third degree burns to hands. Firefighter was admitted and treated in the Hospital for 7 days.

Engine 6 Back-up - First and second degree burns to right hand and left cheek. Firefighter was treated and released from the Hospital.

Truck 6 Tools - First and second degree burns to face. Second and third degree burns to hands. Firefighter was admitted and treated in the Hospital for 6 days.

Truck 6 Saw - First and second degree burns to face. Second degree burns to hands. Firefighter was admitted and treated in the Hospital for 6 days.

## SAFETY ISSUES FOR REVIEW

- **Situational Awareness:** Due to the potential explosive nature of natural gas, crews should maintain a heightened situational awareness when responding to natural gas emergencies.
- **Personal Protective Equipment:** Full PPE should be worn properly and kept in place at all times while working in the immediate operational area of a natural gas emergency.
- **Hose Lines:** Fully charged and positioned far enough away from the structure to limit damage from explosion and allow for immediate deployment should the need arise
- **Risk Versus Gain:** Assess the need to immediately ventilate a structure or wait and monitor Lower Explosive Limits.
- **Hazardous Materials Incident:** Remember that a natural gas emergency is a First Responder - Level I HazMat that may need to be upgraded to an elevated HazMat – Level II incident.
- **Evacuation:** Evaluate the need to evacuate adjacent structures when working at a natural gas emergency.
- **Ventilation Techniques:** If deemed necessary, ventilation should be a coordinated effort with firefighters in position, hose lines charged and full PPE in place.

- **Pressurized Structures:** Recently remodeled and newer homes are typically more air tight, causing higher concentrations of natural gas to accumulate inside before an odor is detected outside.
- **Resource Management:** Consider holding resources on scene until the full magnitude of the natural gas emergency is realized.

## **OTHER ISSUES FOR REVIEW**

Sacramento Fire Department Investigators determined that a gas valve inside the residence was left on and an open flame device had been found on the floor. Based on these facts it was determined that the explosion was a deliberate act.

The Fire Investigators worked closely with the Sacramento Police Department, Alcohol Tobacco and Firearms (ATF), and Pacific Gas & Electric (PG&E). Based on the collaborative effort, information was obtained that linked the neighbor as possibly being involved.

On July 19, 2010, Fire Investigators along with Sacramento Police Detectives and ATF served two search warrants in the 3800 block of 25<sup>th</sup> Avenue. Investigators believed that the suspect had an ongoing dispute with the owners of the residence that exploded, over payment for work completed in 2009. Based on the evidence located and additional follow up, investigators connected the suspect as being responsible for the arson.

On July 20, 2010, at approximately 3:00 a.m., investigators arrested the suspect for arson.