

GREEN SHEET

California Department of Forestry and Fire Protection (CAL FIRE)

Informational Summary Report of Serious CAL FIRE Injuries, Illnesses, Accidents and Near-Miss Incidents



**Fireworks Explosion
August 31, 2012**

**Diamond Incident
CA-RRU-086384**

California Southern Region

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

The following information is a preliminary summary of a minor burn injury to a Riverside County Fire Department Fire Prevention Technician, one moderate burn injury to one of three public fireworks display employees and one critical burn injury that later resulted in the display employee succumbing to his injuries. The third display employee was not injured.

CONDITIONS

Weather:

Temescal RAWS site at 1641 hours:

Temperature – 93 degrees Fahrenheit

Relative Humidity – 14%

Winds – WSW at 12 mph with gusts to 27 mph

Conditions

Located in Riverside County, the City of Lake Elsinore has a population of approximately 51,000. Within the City is a minor league baseball stadium, home to the Lake Elsinore Storm, located in the 500 block of Diamond Dr. It has become a local custom to have a brief 5 to 7 minute fireworks demonstration after each home game. The demonstration for the night of August 31st 2012 was permitted for 310 aerial devices with sizes ranging from two (2) inch to five (5) inches. The site where the shoot was to take place was in a graded dirt field directly across the street (Pete Lehr Dr.). The edge to the mortar racks were set up approximately 182 feet from Pete Lehr Dr. and approximately 479 feet from Diamond Dr. The first of the contracted fireworks company arrived on site at approximately 1430 hours. The first two employees arrived in a Ryder box truck loaded with all of the required items for the fireworks demonstration. The two workers unloaded the truck and started to set up the mortar tube racks. The third worker arrived in his personal vehicle at approximately 1520 hours and parked with the rear of his vehicle facing the Ryder truck, forming shaded work area with the vehicles, the set up continued with the cases of aerial shells being readied for final assembly.

SEQUENCE OF EVENTS

At approximately 1648 hours a Fire Prevention Technician with the Riverside County Fire Department arrived at the Lake Elsinore Storm baseball stadium in his Department vehicle where the fireworks demonstration was to take place. The Inspector was conducting a scheduled permit compliance inspection and display standby. The location that the fireworks were to be shot from was located in a dirt field across the

street from the stadium. The Inspector was just starting to initiate a dialog with the three fireworks employees as to the sequence of the planned demonstration. During this initial conversation, the Inspector observed two of the employees, Employee #1 sitting in a folding nylon and metal framed chair at a makeshift table with his back up against the Ryder truck and the other employee (employee #2) sitting in a plastic chair across the table from the first employee starting to prepare the aerial shells for the night's demonstration. This immediate area also had additional unopened cases of aerial fireworks that were also to be utilized in the show, but had not yet been prepared. This preparation included the opening of one of the cases of fireworks aerial shells and the cutting of the "paper match" section of the shell. This cutting of the "paper match" section is required to allow the insertion of the "electronic match" into the end of the "paper match" in preparation for launching. As this preparation process continued, the third employee (employee #3) was placing the prepared aerial shells and placing them on top of the mortars in preparation for loading.

While employee #2 was preparing a five (5) inch aerial shell, he suddenly yelled out "hot det" and starts to rapidly attempt to throw the shell over his shoulder with his left hand. Before the shell cleared his body, a loud explosion was heard followed by a second louder explosion approximately 3-5 seconds later. This initial series of explosions was rapidly followed by an intense series of multiple explosions that propelled additional aerial shells, sub-munitions and flaming materials in all directions for approximately 30 seconds. During the initial set of explosions employee # 2 rapidly got out of his chair and ran in a northerly direction between the Ryder truck and his personal vehicle out into the open field. The Inspector and employee #3 ran approximately 52 feet to the rear of the Inspectors vehicle and took cover behind the vehicles tailgate. Employee #1 was not seen leaving the blast area until approximately 25-30 seconds later when he emerged slowly walking around the front of the Ryder truck, severely burned and with his arms in an outstretched position.

Upon seeing the condition of employee #1, the Inspector recognized the necessity of getting this employee to immediate medical care. Despite continued residual explosions, the Inspector moved out from his covered position and to the cab area of his vehicle. The Inspector entered his vehicle using the vehicles door and cab for cover. Despite his vehicle continuing to take multiple hits from the exploding sub-munitions, the Inspector was able contact Perris ECC on his vehicle radio and requested a fire and EMS response. The Inspector was able to clearly relay the on scene conditions and provide a brief size up of the rapidly unfolding incident. About this time, a passing ALS private ambulance heard the series of explosions and self-initiated their response to the scene. The ambulance arrived on scene as the explosions were subsiding and spotted their vehicle behind the Inspectors vehicle. The Inspector moved from his vehicle to the severely burned employee #1 and escorted him to the rear of the arriving ambulance so that the ambulance EMT and Paramedic could initiate immediate care on the most severely injured of the employees.

Moments after the arrival of the ambulance, employee #2 walked back into the area. Employee #2 was also triaged by the Inspector and was also escorted to the

ambulance. At this time, it was recognized by the ambulance Paramedic that an air ambulance would be required and a request was made to the Inspector to call for this resource. After this resource request was made by the Inspector to the Perris ECC, the Inspector gathered his fire extinguisher and joined employee #3 in initial extinguishment efforts on the two vehicles and surrounding burning materials. The extinguishment efforts continued until the responding Battalion Chief and Engine companies arrived. It was only after the Battalion Chief and Engines were on scene and working that the Inspector who himself was injured, went to seek medical attention.

CLOTHING

- Fire Department Inspector: The Inspector was wearing a standard issue, CAL Fire compliant, nomex uniform consisting of cotton undergarments, nomex short sleeve uniform shirt and nomex long pants and leather work boots. It should be noted that there was evidence that the Inspector was hit in the middle of the back by a sub-munitions and multiple times by sub-munitions in the lower legs and boots. None of these flaming impacts resulted in any penetration of the uniform of injury.
- Employee #1: Employee # 1 was wearing an unknown style shirt, an unknown style of shorts and shoes. It should be noted that when employee #1 was located, all of his clothing had burned off his body.
- Employee #2: Employee #2 was wearing a cotton short sleeve T-shirt, cotton cargo style shorts and work boots. It should be noted that after the blast and while running away, the T-shirt was removed by employee #2. When employee #2 was located by the Inspector, a portion of his shorts were smoldering in the left groin region. This smoldering was extinguished by the Inspector utilizing a pressurized water extinguisher.
- Employee #3: Employee #3 was wearing a cotton short sleeve T-shirt, cotton long pants (denim style) and shoes. Employee #3 suffered no damage to his clothes.

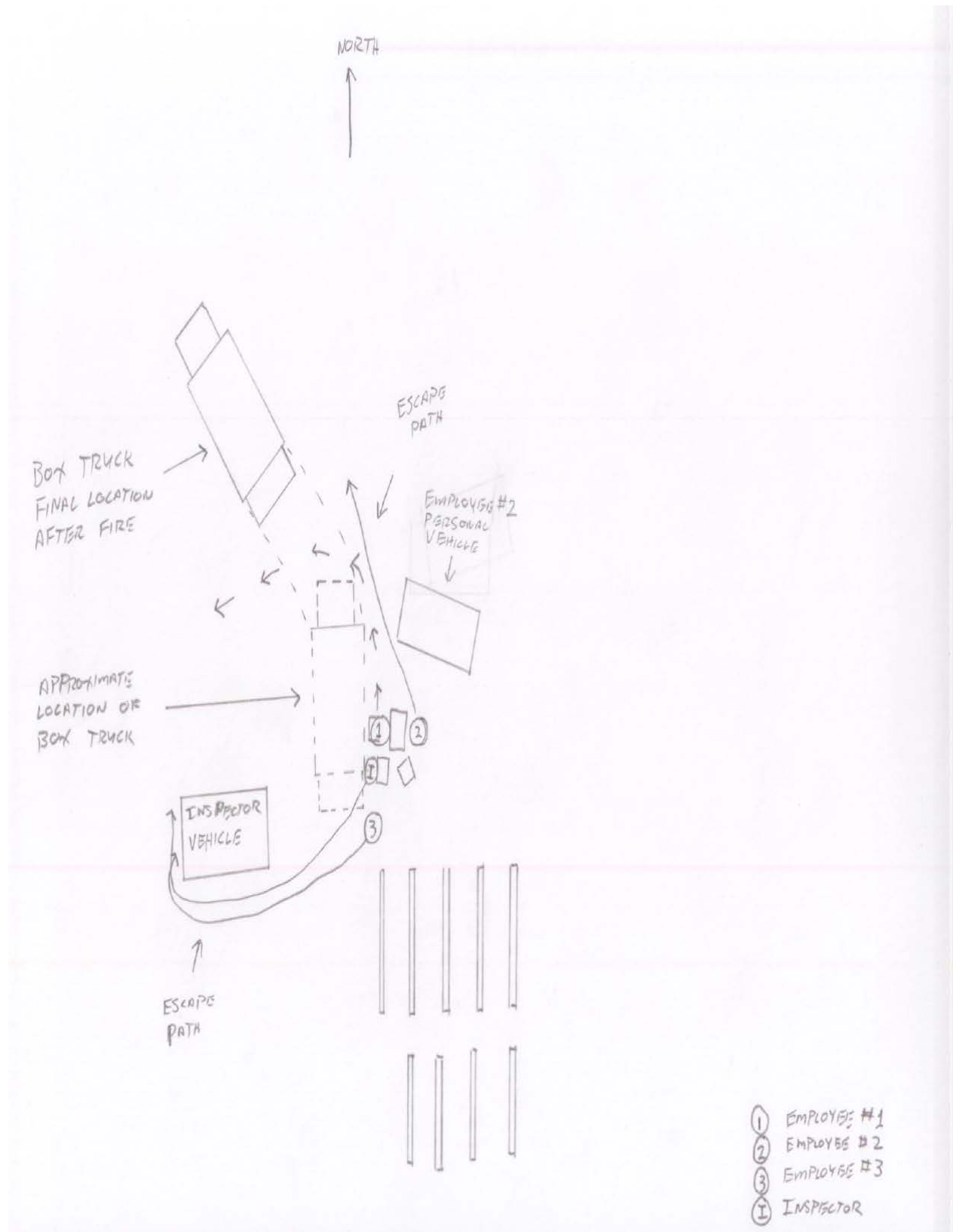
INJURIES/DAMAGES

- Fire Department Inspector: First degree and a small second degree burn to his left elbow.
- Employee #1: Second and third degree burns to approximately 90% of his body. These injuries resulted in the employee succumbing to his injuries on the morning of September 2, 2012.
- Employee #2: First and second degree burns to approximately 5% of his left arm. Sporadic first and second degree burns to his left abdomen, left groin area and left lower leg.
- Employee #3: No injuries.

SAFETY ISSUES FOR REVIEW

INCIDENTAL ISSUES/LESSONS LEARNED (For Near-Miss and Non-Serious Accidents)

- Maintain situational awareness at all times. This proved to be very important for the Inspector. Due to his immediate recognition of a rapidly deteriorating condition, he was able to rapidly egress the blast area and seek refuge.
- Identify escape routes and safety zones during all phases of potentially hazardous work situations. Due to the Inspector having a clear path of egress identified in his mind, he was able to rapidly egress to the rear of his vehicle and seek refuge, using the vehicle as a barrier from the barrage of exploding material.
- Spot vehicles at a distance that will provide a safe work environment. The front of the Inspectors vehicle was located approximately 29 feet from the blast site. While this close location did allow the Inspector and employee #3 to rapidly egress the blast area and to seek refuge behind the rear of the vehicle, it is recommended that vehicles be located at distance that is appropriate with the potential hazard.



Lookouts

Communications

Escape Routes

Safety Zones