National Fire Fighter Near-Miss Reporting System:

Reports Related to Water Enhancers

www.firefighternearmiss.com

Report Number: 06-0000352

Synopsis: Fuel spill flashes after car fire is extinguished.

Event Description: Our station was dispatched to a vehicle fire and upon arrival found a car with fire in the engine area parked in the driveway of a home. 2 other firefighters and I worked to extinguish the fire and accomplished the task without incident. After extinguishing the fire, we noticed that the key was still in the ignition and, although the engine was not running, the electrical system was energized. Because of this, the fuel pump was active and the line had been burned through. Gasoline was leaking in the engine area. The three of us worked to stop the gasoline leak and noticed that one of the damaged battery cables was arcing and sparking. Despite this, we continued to work to stop the leak. I removed my gloves to try to facilitate crimping the fuel line and getting the leak stopped. At this time, since the fire was extinguished and there was no smoke, all but one of our crew had removed our face masks. As we continued to work, the battery cable arced and ignited the fuel vapors causing a flashover. The fuel that had been running down the sloped driveway was now a river of flame. All three of us at the car were engulfed in the fireball. The hand line was lying in the fuel that was running down the driveway, as well as an electrical cord from the engine that was powering a scene light. The fire was quickly knocked down and we used class B foam on the fuel fire. The three of us involved in the flashover were fortunate; the only injury was to one of my fingers, a small cut and burn.

Lessons Learned: The first mistake I made was to not have the battery cables cut to de-energize power. We had tried to remove the key but were unable to due to damage to the ignition. Once we started to look at the battery, we were detoured in our task when we found the leaking fuel line. All three of us concentrated on that task instead of taking out the battery threat. We also did not take into account the fuel that was pouring down the driveway soaking the hand line, electrical cord, and pooling near the engine, which was at the end of the driveway. I also remove my gloves, which could have led to serious burns. After critiquing the incident with fellow responders and the crew, we realized we should have continued with our first task, cutting power to the vehicle. We should have also recognized the threat of the gasoline spilling on the driveway and taken action to apply foam immediately while another crew worked to stop the leak. The engine placement directly at the end of the driveway was not correct. The fuel spill aside, the vehicle could have been in gear or in neutral and rolled down the driveway striking the engine. As for not having face masks on while working to stop the fuel spill, we were not sure that we would do that any differently. Our department does not wear SCBA to mitigate a fuel spill, and once the smoke from the car fire has dissipated, and we are not working in a confined area that would retain harmful contaminates, we usually remove our masks. In the future, when we have a source of ignition as in this case, we will wear SCBA with mask. The decision to continue wearing SCBA will be made depending on the circumstances, with memory of a potentially life-threatening flashover guiding us. Our particular station is very good about wearing full turnouts while working at incidents, even minor ones. The lesson about removing the gloves was valuable since many of us do that. The gloves don't allow you to work with small equipment and pieces very easily.

Report Number: 07-0000938

Synopsis: Gas tank on boat explodes during overhaul, after fire is extinguished.

Event Description: At 0350 hours, Engine [number deleted] responded to a "boat on fire" in the apartment complex. Our company consisted of an engineer/operator, two firefighters and myself. Upon arrival, we found a boat engulfed in flames in the rear of the apartment complex on its trailer, still attached to a Ford Explorer. Already donned in full protective gear, we pulled our "trash line", 100' of 1 3/4", and proceeded to extinguish the fire which took about 3-5 minutes. Immediately after extinguishment, I called for an arson investigator to come out and take photos and investigate the fire. We took off our air packs, masks, and coats after the fire to await the arrival of arson. There was some smoldering -vs. - steam coming from the rear of the boat, but we paid no special attention to it since other parts of the boat had some steam from the freshly extinguished fire. About 30 minutes after we put the fire out, I started talking to area residents, and they stated that neither the boat nor the car had been moved since February 2007, and that the vehicle had "out of state" plates. I walked past and around the boat, and there was still some smoldering. About 45 minutes after extinguishment, the arson investigator arrived. I had my two firefighters put some water on the boat to "prevent rekindling" due to the smoldering. My firefighters had their bunker pants with boots and gloves and proceeded to wet down the interior rear of the boat. They sprayed it for about 15 seconds, then turned the nozzle off. One of the firefighters attempted to peer inside to see why it was still smoldering after they placed water on it and then, WHOOOOOSH! THE GAS TANK EXPLODED! I was behind the engine and ran around to see the rear of the boat fully engulfed in flames. Since I had my gear outside of the pumper, I quickly put my coat and gloves back on and took the nozzle and had my two firefighters get back into their coats and helmets. Since the gas tank ruptured, we could no longer extinguish it with water, so we used our foam applications of 3% to extinguish the flames and suppress the vapors. After about two minutes of foam, the incident was back under control. We cleaned our foam eductor, and flushed the line, picked up our equipment and returned to service with a whole new respect for vehicle fires.

Lessons Learned: Never underestimate salvage and overhaul since this is where a large number of post fire injuries occur.

When doing a post analysis of any incident, we need to have at minimum, hand, head and eye protection (helmet and gloves).

Report Number: 08-0000044

Synopsis: Problem with CAFS unit identified at live burn.

Event Description: Department wide training at a donated house. We burned for 2 days with great results. Good training and no injuries resulted for either day. Followed NFPA 1403 and had a great game plan.
Senior personnel (Deputy Chief, District Chief, and 2 Officers from a neighboring Department), planned an end of the day burn to evaluate the effects of CAF in a live burn situation. CAFS engine was set up and burn room was prepared with hay. Crew entered the burn room and activated hose line in the burn room. Foam was not directly aimed at fire, but towards the general area. During the initial stages, a burst of air exited the line (1 3/4"), and the fire rapidly increased. It was determined that this was not a flashover, but rapid fire intensification due to the disruption of the fire conditions. Nozzle man was on all 4's inside the room when this occurred. Nozzle man felt heat increasing, and exited the room and house per the exit plan. No injury resulted, but coat, helmet, and face piece received heavy fire damage. We interviewed the FF and DC to get their interpretation of the incident. Upon investigation of the CAFS Engine the following day by the Quartermaster and maintenance personnel, the CAFS system was inspected and found that there were issues. The CAFS flow gauge was not working and the system did not work in the "Auto" mode. The CAFS system was put in manual or Tool mode and still did not work properly but did inject a high concentration of air in the systems that overloaded the hose line with air over water/foam. Station Officers were notified that the CAFS system was out of service until repairs could be completed.

Lessons Learned: CAFS should not be routinely used as an initial knockdown tool in a overly hot environment. It is similar to what happens when a direct attack is initiated on a fire that is near flashover or mushrooming. The burst of air coupled with the smaller droplets do not give a cooling effect, but instead displaces the heat which travels back to the hose team. Equipment issues can contribute to worsening conditions. FF's should always be prepared for changing conditions when CAF's is entered into a live fire scenario.

Report Number: 10-0000550

Synopsis: Errors made during fuel spill attack.

Event Description: We responded as a mutual aid engine company to a reported over-turned 8000 gallon gasoline tanker on the on ramp to [the interstate.] On arrival, the tanker was found overturned and fully involved down a 25 foot embankment. The area had been under construction and surface area off the roadway was un-compacted gravel. The combination of the location down the embankment, the live gravel surface combined with the rain and flowing gasoline made for difficult but not impossible access for firefighting purposes. The area essentially formed a large bowl and contained the fire from other risks.

Once water supply was initiated, and sufficient foam attack ability was on site, an organized foam attack began from the upper roadway using both hi-expansion and protein foams. The tanker was of aluminum construction and basically melted to the liquid level. Once the running area fire was blanketed and controlled, the control effort shifted to using hi-expansion to put each open compartment out. Mutual aid continued to arrive to support the effort. The mutual aid included a response of a crash truck from [the local international] airport which had not arrived prior to the extinguishing effort of the open compartments.

Command, at first failed to recognize the success of the extinguishing efforts. They wanted to use the crash truck in the effort despite the success of the existing attack. Wanting to use the airport truck, in poor judgment, a water line was ordered to blow the foam blanket off an open compartment that had been extinguished. The resulting flash also effected the other compartments, and flashed back under the foam blanket on the ground, surrounding the attack crews. Do to the muddy area they could not rapidly escape.

Once again, control of the fire was achieved by on scene crews. The airport crash truck arrived soon after, and due to tempers at the scene, the chief went to a safe place (his locked car)

No injuries (remarkable) but lots learned, all from a fire that would have taken care of itself had it been left to burn with no risk to the area or crews. Environmentally, incidents such as this would be better left to burn when feasible.

(Note: Lots has changed in the years that have followed. This level of faulty judgment would not occur today.)

Lessons Learned: Take into account the big picture.
Use incident command always.
When it's right, "let it burn."

Report Number: 10-0000816

Synopsis: HVAC unit falls from roof.

Event Description: I responded with a crew of three on our foam engine per a mutual aid agreement with the [city name deleted]. The time was about [time deleted] and it was approximately nine hours into the fire. The call for this fire had come in about [time deleted] and within minutes, had gone to about eight or ten alarms.

When our engine crew arrived, we passed dozens of engines from all over the county as well as about five engines from [city deleted]. All had been on scene for many hours including our

ladder truck. The fire was at a high tech plastics recycling plant less than a mile from our facility. The building was an older approximately 30 to 40 thousand square foot warehouse that had been converted over to facilitate the processing of plastics from used TV's, computers, keyboards etc. By the time we arrived, most of the fire was done and the roof had already collapsed. Our crew was given an assignment to enter the building and seek out hot spots that were still smoldering and basically cover the hot spots with foam. Another firefighter and I entered with full PPE and air. We made it 150' into the building walking on black melted plastic with metal shards sticking out everywhere. We turned right after identifying a large hot spot and continued in another 50'. We laid down a lot of foam during 5-10 minutes with hardly any effect. We moved to the left for another smoldering hot spot, did the same and then to the right. We laid down probably 400 to 500 gallons of foam without hardly any effect.

We reported in to the IC over the radio that the foam was of little use and we were coming out. About then, my partner fell through melted plastic that we were standing on all the way to about mid thigh. He screamed at me that it was burning his legs through his boots and turnouts. I attempted to pull him out and he told me to stop because his boot was still stuck and his legs were coming out without his boots. The metal shards were also cutting into his legs. We decided that I was going to have to dig him out by hand so that I could get to the stirrups of his boots. That worked but it took me about two minutes to get him free. By this time we were both about out of air and wanted to get out of there. We started to make our exit and while we were exiting, we heard this one sharp loud cracking sound and started running for the exit door. Just then the building's A/C unit came crashing down about where we had just been walking. So the end of this is, that we were walking on top of two to four feet of semi-melted plastic and operating almost directly beneath an A/C unit that probably weighed 2000 pounds.

Lessons Learned: Know what you're walking on during and after a fire. Be extremely aware of your overhead, especially after a roof collapse.

Report Number: 10-0001143

Synopsis: Falling foam container strikes driver.

Event Description: My crew at work [department name, date, and time omitted] was assisting me in changing from a spare apparatus back into our first line apparatus after repairs. I am the FADO-Fire Apparatus Driver Operator. The captain was shuttling equipment from the spare rig as I was organizing the hose appliances to put them away in the driver side compartment just behind the pump panel. The firefighter was handing equipment from the ground to the lieutenant, who was above the pump panel placing the equipment in the upper storage bin over the pump panel area. The firefighter handed the lieutenant a five gallon pail of AFFF. As

the lieutenant grabbed the foam pail by the handle and lifted it, the handle failed and the foam pail fell approximately seven feet, striking me on the top and back of my head as I was bent over picking up an appliance. I felt the impact of the pail and remember closing my eyes and amazingly I never lost consciousness. I then heard the pail hit the ground. I stood up straight and opened my eyes as the firefighter grabbed me and asked if I was okay. The lieutenant came down to check on me, and he was as pale as a ghost. The captain also came running over. Talk about pain! I have never had such a headache. I also had pain in the neck and shoulders. I was taken to the local employee clinic for x-rays and further examination. I refused to be transported in the ambulance (maybe not the smartest move, but pride took over). Fortunately, I only sustained a big bruise on the top of my head, and some strained neck and shoulder muscles. The doctor was amazed that I did not sustain a more serious injury after being struck directly by an object weighing over 50 pounds. Fatal injuries have occurred from being struck by much smaller and lighter objects.

Lessons Learned: NEVER trust the handle when lifting a foam pail where it could fall on someone; always support it from beneath at all times.