



**National Fire Fighter Near-Miss Reporting System
Reports Related to Incident Safety Officer and Fixed-Burn Building Evolutions**

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Report Number: 05-053
Report Date: 05/27/2005 1410

Demographics

Department type: Combination, Mostly paid
Job or rank: Battalion Chief / District Chief
Department shift: 24 hours on - 48 hours off
Age: 43 - 51
Years of fire service experience: 11 - 13
Region: FEMA Region III
Service Area: Suburban

Event Information

Event type: Training activities: formal training classes, in-station drills, multi-company drills, etc.

Event date and time: 03/31/1973 1419

Hours into the shift: 0 - 4

Event participation: Involved in the event

Weather at time of event:

Do you think this will happen again? No

What were the contributing factors?

- Procedure
- Training Issue
- Decision Making

What do you believe is the loss potential?

- Life threatening injury

Event Description

During live burn evolution, firefighters became involved in a flashover situation resulting in equipment damage and no injuries. Training team was inside the main room observing fire build up in a rear bathroom. The fire spread unnoticed to an adjacent wall through convection, flame roll over from the ceiling area. When the far wall behind the training team ignited the additional heat caused the entire room to flash over forcing the training team to leave the floor and to conduct an emergency exit through the front door. The cause of the fire extension was the use of a combustible liquid (diesel fuel) spread onto the wall prior to the beginning of the evolution.

Lessons Learned

Follow NFPA 1403 live fire training standards and eliminate the use of combustible liquids to fuel training fires.

Report Number: 06-461
Report Date: 09/07/2006 1548

Demographics

Department type: Combination, Mostly volunteer
Job or rank: Captain
Department shift: Straight days (8 hour)
Age: 25 - 33
Years of fire service experience: 11 - 13
Region: FEMA Region X
Service Area: Suburban

Event Information

Event type: Training activities: formal training classes, in-station drills, multi-company drills, etc.

Event date and time: 05/01/1991 1200

Hours into the shift: 5 - 8

Event participation: Involved in the event

Weather at time of event:

Do you think this will happen again? Uncertain

What were the contributing factors?

- Procedure
- SOP / SOG
- Training Issue
- Situational Awareness

What do you believe is the loss potential?

- Life threatening injury
- Lost time injury

Event Description

At the time of this event I was employed as the Training Captain for the City of [Name deleted]. I had been in the fire service for about 11 years however; I had only been a Training Officer for about two years.

The event occurred during a controlled training burn in a residential structure. The garage had been converted to a family room and the interior walls were covered with plywood, as was the ceiling. We had conducted multiple single room fires throughout the home with an emphasis on getting in quick for a direct attack. The final planned entry was for the family room area, and the intent was to allow the fire to spread to more than one room.

At the time the crews were directed to make entry, the fire was pushing out of the exterior door that went directly into the family room. Fire was coming out of the door down to at least the door knob level and the cement floor could be heard spalding. The fire grew rapidly as the crew made entry. Unfortunately, they entered in the same fashion as the previous evolutions, quickly and semi crouched without flowing water from the nozzle. The total time of entry was less than six seconds as the crew stumbled out. One firefighter suffered serious burns to his arms and shoulders and the SCBA mask was blackened by bubbles of plastic. I don't believe they ever discharged any water.

The lack of communicated expectations on my part and the lack of recognition on the part of the nozzleman were key factors that lead to this near catastrophe. I should have made it clear that this was a different type of fire problem. They should have observed the conditions were not suitable for immediate entry, and that some firefighting at the door would be necessary before making entry.

The other thing that I failed to recognize, although I was aware of the wall covering, was that the burning characteristics of plywood are much different from sheetrock. The added fuel caused an intense and extremely hot environment with rapid fire growth. In fact, it grew faster than expected which caused a later than desired entry although, I recognize that fact likely prevented multiple injuries or possibly the death of one or more firefighters.

Lessons Learned

First and foremost was attention to detail and structural make up. The plywood walls were obvious, yet not accounted for. Firefighters in a training mode will likely do exactly what you tell them to do, so when the scenario changes you must communicate changes in expectation. The spawling of the concrete should have been recognized as a sign of intense heat, or at least a rapid heat increase.

Report Number: 06-493
Report Date: 09/29/2006 2228

Demographics

Department type: Combination, Mostly volunteer
Job or rank: Fire Fighter
Department shift: Straight days (10 hour)
Age: 43 - 51
Years of fire service experience: 14 - 16
Region: Canada
Service Area: Suburban

Event Information

Event type: Training activities: formal training classes, in-station drills, multi-company drills, etc.

Event date and time: 05/16/2005 0000

Hours into the shift: 0 - 4

Event participation: Involved in the event

Weather at time of event:

Do you think this will happen again? Uncertain

What were the contributing factors?

- Situational Awareness

What do you believe is the loss potential?

- Minor injury

Event Description

I was conducting introductory live fire training exercises for a recruit class. Conditions for entry were restricted to below 400F measured at 42" above the floor with medium smoke conditions as the objective. Earlier in the day we had conducted a safety walk through of the tower with the instructors and students to identify window and door locations and operation in the event of a situational development. I had done this for the past seven years and had a thorough routine (or so I thought) for assessing and advising tower conditions.

The morning passed well with three small burns in the lower chamber conducted and the students had performed well. After lunch, another instructor and I made entry to re-start the burn in the lower chamber. Per SOG, three hard wood pallets were placed on the ember bed and as they proceeded to ignite we made for the ante room exit. Passing through the ante room I noted a couple of pallets and some debris on the floor. Ducking down to hands and knees I tidied up as my partner exited. "I'll only be a few seconds..." I remember thinking. Suddenly the blackened room turned bright and I looked up over my shoulder. The ceiling and upper walls were ablaze with "liquid flame" falling from the ceiling. Heat pressed down quickly. I flattened out and belly crawled for the exit. Heat surged through my bunker gear and my face plate blurred. Crawling past the burn chamber I kicked the steel door shut and levered myself for the exit, barrel rolling out onto the training ground. From my back I kicked that door closed and popped up onto my feet in front of a dozen stunned on lookers. It was then I realized the purge valve on my Scott 2.2 was actually aflame and I snuffed it out with my glove. Responsibility for the tower took hold. I darted around the first level and opened relief hatches. Returning to the main entry, the thermocouple display as surging past 1300F

and peaked about 1390F before cooling began. Fellow instructors came to my aid as I removed my gear piece by piece. A few moments of fresh air and water had me turning back to assess what had just transpired. My AV300 face piece lens looked like running water on a window pane. Both turnout coat and pants were color changed to a cheery peachy orange except where the back frame and straps had sheltered it. My helmet, visor and decals were charred black.

Outwardly I was unhurt save for a bright red ring on my face at the edge of my mask seal even with the flash-hood properly donned. It eventually blistered in a couple of spots and peeled like bad sunburn. The room cooled down and we re-entered the burn chamber.

On my morning walk through I had noted the blackened conditions to the students but my mind had missed an important tell tale. The burn chamber had shone a glossy glass-like black, coated in tarry creosote and by-products, but it didn't set off the alert it should have. Residue of the tar was approximately 1/4 to 3/8 inch thick at the floor but the upper walls and ceiling were now raw fire cement.

The three earlier fires had slowly dried out the creosote. This lowered its' ignition temperature to a level which the pallet fire temperature could ignite. Once ignited the creosote rapidly accelerated to point of flash-over like conditions resulting in the intense light and heat I had just endured. But for a few moments in time I could have very well led 4 new recruits into an unintended, unexpected situation they were yet to be trained for. But for a few seconds, and instinct from sound training from my previous instructors, the atmosphere could have consumed me. In the aftermath it became clear that the recent acquisition and use of a flashover unit had relegated the tower to "colder" smokier fires generating higher than "normal" deposits on the walls and ceiling. Subsequently an SOG directs that levels will be checked on a regular basis and cleaned as required. I feel quite fortunate to have had good people impart great knowledge in the past that allowed me to react and survive. I will carry that legacy forward to all I come in contact.

Lessons Learned

In the end it's the same monster that can catch us all as things become routine and comfort levels increase....complacency. Nothing is ever routine. Whether on the fire ground or on the training ground, everyone should be vigilant.

Initially I thought that the sole lesson learned had to have been the failure to recognize a potential hazard in the excessive build up of creosote and it's state. Subsequently when I have related this event to other classes and instructors, other factors have come to mind.

1. Turning my back on a fire, any fire.
2. Staying without my partner. "I'll only be a second or two".

These were making exceptions to good practices. Early morning after a late shift, time constraints, mutli-tasking all contributed to a deadening of awareness and situational interpretation. Prevention of a re-occurrence comes down to one of my favorite examples in any training session - from Sesame Street, the "Grover Factor" or "What happens next?" What happens next is often the key in decision making as the cause and effect recognition prior to committing to an action. Recognizing the extent and condition of the creosote, it's potential for physical change when exposed to heat and the resulting hazard should have occurred.

It did not. Post incident, the use of non-caustic cleanser to power wash the burn chamber, or regularly scheduled hotter fires to keep accumulations at acceptable levels was discussed and implemented.

Report Number: 07-773

Report Date: 03/06/2007 1420

Demographics

Department type: Combination, Mostly volunteer

Job or rank: Assistant Chief

Department shift: 24 hours on - 48 hours off

Age: 43 - 51

Years of fire service experience: 11 - 13

Region: FEMA Region V

Service Area: Rural

Event Information

Event type: Training activities: formal training classes, in-station drills, multi-company drills, etc.

Event date and time: 11/25/2006 0900

Hours into the shift: 0 - 4

Event participation: Involved in the event

Weather at time of event: Clear and Dry

Do you think this will happen again? Yes

What were the contributing factors?

- Human Error
- Training Issue
- Situational Awareness
- Decision Making

What do you believe is the loss potential?

- Lost time injury
- Minor injury
- Life threatening injury

Event Description

Our department was conducting a joint training between our rural department and a larger metro dept from our area. This training was being conducted at our live burn training center. Our training center consists of 4- 20' steel shipping containers on the ground floor with one 40' steel container placed across the top of the front two ground level containers making a second floor. We have both an interior steel stairway and an exterior wood stair to the second floor.

After several reps of basic first floor fire attack evolutions all crews took a break before we began a simulated basement fire evolution. All doors were opened to allow dissipation of stored heat and smoke. Per our SOP/SOG's we placed a safety officer on both floors and began stoking both of our first floor burn rooms with pallets and straw. Both safety officers were in full PPE with SCBA with radios for communication.

This drill is conducted by staging the 2 man crew at the top of the interior stairs on the second floor. When the first floor safety officer determines the conditions are appropriate the crew then descends the stairway and extinguishes the fire. The second floor safety officer monitors the conditions upstairs and assists with hose movement at the top of the stairs.

My role that day was the second floor safety officer. After 3 reps, the smoke in the upstairs container had reduced visibility to approx. 2-3" at the floor, I also began to notice very significant heat at mid level in the container. We had a crew in the "basement" at the time. As the heat conditions became intolerable I decided to vent the upper container by opening the upstairs window. After accomplishing that task I could begin to feel significant heat through my bunker gear and began crawling to the door. I failed to keep myself orientated to the container by keeping my hand on the wall. I believed that I was moving in a straight line to the exit, however I had become disoriented and before I realized it I fell down approx. 3-4 steps of the interior stairwell. I was able to stop my fall by extending both arms; however my helmet dislodged and fell forward with the chin strap catching my SCBA mask almost dislodging it. I found myself in basically in a chimney with extremely hot gases and smoke surrounding me. I was able to climb back up the steps and make it to the exit. Upon exit from the container I was able to stop the evolution with the crew still in the "basement" allowing the crew to exit without injury or danger.

I still feel very fortunate that the only thing injured was my pride and feelings of invincibility. I believe the major contributing factors to this near miss were first and foremost my lack of awareness to the changing conditions and not following my training. By not keeping myself orientated I placed not only myself, but anyone else who would have had to rescue me in danger. I feel that I had allowed myself to become less than aware, after all, this was just training. After a post training critique it also became clear that both fires were allowed to exceed the temps set forth in our training SOP/SOG's resulting in a higher temp in the upper container than normal. We also discovered a design flaw in that we have nothing in place on the upper entrance of the stairwell to prevent accidental entry into that stairwell.

Thank you for giving me the opportunity to submit my near miss. I hope that it can help prevent a similar incident in the future. It definitely was a wake up call to me.

Lessons Learned

First and foremost I learned to not ignore your training no matter how many times you've done it. It can be a fatal mistake to not pay attention. This incident has also made us re-evaluate our training SOP and retrain all our people to more closely monitor the safety conditions at our training center. We have also had to change the thinking that the hotter the fires the more training we get out of them.

We have re-evaluated the design of our training center and are putting more exhaust vents into place and securing the upstairs entry into the stairwell with a door to prevent a similar episode in the future.

My suggestions to prevent a similar event are:

1. Follow your training
2. Really look at and evaluate the design of your training facility
3. Ensure that everyone operating at your training facility is sure of the SOP's.
4. Require full PPE and SCBA when appropriate.
5. If the Chief does something stupid, tell him. [Crew Resource Management]

Report Number: 08-064
Report Date: 02/04/2008 1714

Demographics

Department type: Paid Municipal
Job or rank: Training Officer
Department shift: 24 hours on - 48 hours off
Age: 34 - 42
Years of fire service experience: 21 - 23
Region: FEMA Region IV
Service Area: Urban

Event Information

Event type: Training activities: formal training classes, in-station drills, multi-company drills, etc.

Event date and time: 04/18/2005 1305

Hours into the shift: 0 - 4

Event participation: Involved in the event

Weather at time of event: Clear and Dry

Do you think this will happen again? Yes

What were the contributing factors?

- Training Issue
- Procedure
- Staffing
- Decision Making
- Equipment

What do you believe is the loss potential?

- Life threatening injury
- Lost time injury

Event Description

On April 18, 2005, under the supervision of the Training Chief, members of Recruit Class XX were to conclude their 14-week academy with a full day of live fire scenario based training. Assisting in this training were members of Engine X, Truck X, two members of the Recruit Training Staff, one off-duty firefighter, and several members detailed to light-duty assignments. One additional reserve engine (Engine XX) was used in support of this event.

The day began with a high-rise evolution using the five story-training tower. A burn barrel was placed on the fifth floor (stoked with a minimal amount of class A materials for smoke generation – the fire was contained within a burn pan and controlled using a pressurized fire extinguisher - the tower is open air concrete masonry, noncombustible); a second “simulated” fire was set-up on the second floor (within a Denver Prop) using the department’s synthetic smoke machine. Two victims (rescue manikins) were positioned on the fifth and second floors respectively to simulate trapped occupants. Safety personnel were assigned to each floor of operation including two members on the fifth floor, one member on the second floor. Members of the Recruit Class were assigned to their respective apparatus with a qualified driver and staged at Station X on XX Drive to await a simulated dispatch.

Engines X, XX, and Truck X were dispatched to a reported high-rise fire with victims reportedly trapped. Engine X (including two members of Recruit Class XX) arrived on scene and was assigned to lay a supply line from the yard hydrant and support the fire department connection (FDC), upon completion of this assignment, they were to deploy an attack line (using a high-rise pack) from the fourth floor and advance it to the fifth floor to knockdown any remaining fire within the burn pan - this assignment was carried out without incident.

Engine XX (including two members of the Recruit Class) was assigned to deploy a 35' ground ladder to the Bravo side of the building and remove a victim trapped on the second floor, the victim was successfully removed and a second assignment for salvage of the fourth and fifth floors were also given – these assignments were completed without incident.

Truck X (including two members of the Recruit Class) was instructed to place the aerial in service and initiate a rescue from the fifth floor, a secondary assignment for salvage of the third floor was also given; both assignments were completed without incident.

All participants were released for a brief lunch break and requested to return at 13:00hrs. The crews of Engine X and Truck X were returned to service to be replaced by the crews of Engine XX and Truck XX to complete the schedule training for the day.

At 13:05hours the Training Chief briefed the respective crews of Engine XX and Truck XX and made the necessary assignments to complete the assigned task. Several small-scale incidents were conducted including a dumpster fire, car fire, animal rescue, and a medical assist involving a school bus fire. Each incident was conducted without incident. A post-incident briefing was conducted and units were once again staged at Station X for the “grand finale” burn.

Prior to initiating the final “live-fire incident”, the Training Chief assigned two members of Truck XX as the designated RIT team, a safety line was put in place and four (4) members were assigned for ignition/interior safety (Two per floor of operation). Two fires were subsequently set (one on the first floor and one on the second floor of the burn building). The Training Chief served as the Incident Commander/Dispatcher and units were dispatched accordingly.

Upon arrival, Engine X (including two-members of the Recruit Class) was assigned to initiate a fast attack/search on Division 2 (Second Floor). Truck X (including two-members of the Recruit Class) was assigned to perform an aerial rescue of a victim visible from the second floor (Charlie side of the building). Engine XXX (including two-members of the Recruit Class) was assigned to lay a supply line to Engine X, and pull an attack line (from Engine X) for fire attack/search of the Division 1 (First floor). All assignments were actively in progress and being performed as requested.

As Truck XX (aerial ladder) was being deployed, the two instructors (Interior Safety Crew members operating on the second floor) were visible from the Charlie side window. As a crew member (Recruit Firefighter) assigned to Truck XX ascended the aerial ladder, it was noticed that the aerial ladder was not extended/positioned sufficiently to reach the Charlie side window – several attempts were made to communicate (verbally) to the firefighter ascending the aerial ladder to position himself on the safety steps to allow for further extension. At the same time, it was noticed that the two instructors visible at the Charlie side window needed to

exit the structure due to rapidly changing conditions. Confusion ensued and the two members were forced to retreat onto the aerial ladder due to extreme heat conditions. The two instructors safely exited via the deployed aerial ladder and the incident was concluded without further incident.

Following this incident, a briefing was conducted with members of The Recruit Class and the instructional staff. Two first aid reports were completed for the two instructors injured in this incident, and two damaged property reports were submitted.

Lessons Learned

Investigative Findings:

- Two (2) members of the instructional staff received minor burns to their back and shoulders – one injury would subsequently require medical treatment.
- Two (2) protective helmets (one in-service helmet, and one training helmet) and coats received extensive thermal damage, while the pant leg of one member was also damaged due to burning debris on the floor.
- An excessively large stock of class “A” combustibles were staged within the burn building including stacked pallets and other related combustibles.
- Staged class “A” combustibles were positioned in areas that potentially blocked secondary means of egress for interior crews thereby creating an unnecessary safety hazard.
- An unanticipated rapid-fire spread occurred when a secondary fuel set ignited near the interior stairwell obstructing the primary path of egress for the instructors operating on the second floor.
- Interior personnel (instructors/students) were not equipped with radios for emergency communications.
- A safety line while in place, was positioned at ground level and NOT charged prior to ignition – no safety line was in place for instructors operating on the second floor.
- No ladders were deployed for secondary means of egress for crews operating within an IDLH environment.
- An inadequate number of qualified/capable personnel were on scene to support the training scenario being conducted.
- No designated safety officer was on scene.

Preventative Recommendations:

- Limit the amount of combustible fuels staged within the building for each incident. No pallets or other such contents shall be permitted to obstruct primary or secondary means of egress.

- The lead instructor and designated safety officer shall conduct a formal walk-thru to assess fuel placement prior to ignition.
- A safety briefing shall be conducted prior to each burn to include: ignition sets, order of sets, escape plans, attack plans, and scenario objectives.
- Back-up crews of sufficient personnel (Minimum of four) shall be available to relieve interior safety crews – this shall be above and beyond the designated RIT team.
- A safety line shall be positioned on each floor of operation during ignition; no instructor shall be permitted to remain in the building while crews are responding from a remote site.
- RIT team personnel shall be required to conduct a 360° evaluation of the structure every 10 minutes to properly assess the progression of the incident and the condition of the visible crew members.
- RIT team personnel shall be assigned to set-up secondary means of egress (i.e. ground ladders) if not already established by active participants.
- All interior crew members (including students/instructors) shall be equipped with a radio for personnel safety and related incident communications.
- All “Close Call” incidents shall be adequately documented and reported to the Chief’s office for review.

Report Number: 08-292
Report Date: 06/10/2008 0717

Demographics

Department type: Paid Federal
Job or rank: Fire Fighter
Department shift: 24 hours on - 24 hours off
Age: 34 - 42
Years of fire service experience: 14 - 16
Region: FEMA Region II
Service Area: Suburban

Event Information

Event type: Training activities: formal training classes, in-station drills, multi-company drills, etc.

Event date and time: 06/03/2008 1845

Hours into the shift:

Event participation: Involved in the event

Weather at time of event: Clear and Dry

Do you think this will happen again?

What were the contributing factors?

- Decision Making
- Communication

What do you believe is the loss potential?

- Life threatening injury

Event Description

Our department was scheduled for a live burn training exercise at the [name deleted] training academy. This was a night-time burn and we received no pre-briefing, which is a NFPA standard for live burns. We also received no emergency procedures to use in case we needed them. We were not allowed to put the fires out in these scenarios, just to spray water around the fire. We remained motionless in the fire room with no ventilations procedures being allowed. I suffered steam burns as a result during one evolution.

We were given no more than three minutes between evolutions, which I gather they considered, "Rehab."

We had twenty year olds in fantastic shape almost keeling over from exhaustion due to the unnecessary heat in the building, caused by the lack of ventilation. It was a career first to bear witness to such ignorance and lack of professionalism.

Lessons Learned

To ensure that all members understand the scenario that they are about to go into. Incident Commanders with past track records for reckless training and overly aggressive attitudes are out there and can no doubt place firefighters at risk.