National Fire Fighter Near-Miss Reporting System
Flashover: Grouped Reports

Report Number: 09-0000171
Report Date**:** 02/13/2009 09:33

Synopsis
Underestimated fire conditions endangers FF.

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

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 01/12/2009 02:59
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?
- Teamwork
- Human Error
- Situational Awareness
- Individual Action
- Training Issue

What do you believe is the loss potential?
- Life threatening injury

Event Description
The first arriving engine found a fully involved two story wood truss apartment fire. The occupants escaped via jumping from the balcony prior to arrival. This information was transmitted by the first arriving officer. The fire attack team underestimated the fire conditions and selected a 200 ft, 1¾" fog nozzle attack line and the nozzle man entered the fully involved space alone. Shortly after, the firefighter was driven out by the intense heat.

If he arrived prior to full room involvement he would have experienced flashover as he failed to recognize post-flashover conditions. The safety officer, upon his arrival within five minutes of initial dispatch, recognized the fire conditions and immediately ordered the attack team to rehab and reported his findings to the incident commander.

The incident commander, upon his arrival within five minutes of the initial dispatch, ordered and confirmed personnel accountability reports and switched to a defensive mode by applying the first in attack engine's master stream deck gun. Upon learning of the firefighter's personal protective equipment and helmet conditions, he ordered the firefighter to be transported to the hospital for complete evaluation.

This department will be conducting flashover recognition training in the coming months. Although the building has been condemned, it was not a total property loss, because of the rapid deployment of the master stream. The fire was contained to the occupancy, but the damage to the wood trusses was substantial. At this time the full investigation has not been completed.

The main point of this posting is to prevent the failure to recognize pre-flashover conditions by everyone not just officers. Had this ten-year firefighter entered minutes earlier, he would have been more than five feet into the structure as it flashed.

Accountability and safety is the responsibility of everyone. There is no excuse for lack of training and responsibility. The nozzle man should have known better and his officer failed to prevent this action by allowing his entry and then feeding his hose line instead of pulling it and the firefighter out.

Lessons Learned
This incident is currently under investigation and we, as officers and firefighters, will be conducting flashover and fire development training in the coming weeks.

Report Number: 10-0000745
Report Date: 05/12/2010 14:47

Synopsis
Rapidly changing conditions threaten crews.

Demographics
Department type: Paid Municipal
Job or rank: Fire Fighter
Department shift: 24 hours on - 72 hours off
Age: 25 - 33
Years of fire service experience: 4 - 6
Region: FEMA Region VIII
Service Area: Suburban

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 02/26/2010 14:24
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
- Procedure
- SOP / SOG
- Communication

What do you believe is the loss potential?

- Minor injury
- Lost time injury
- Life threatening injury
- Property damage

Event Description

Brackets [] denote reviewer de-identification.
Tower [1] responded to a residential structure fire. Tower [1] was the first arriving unit to the scene with light smoke showing from the front door. The fire was reported by the homeowner in the basement of the home. Crews opted for an interior attack with a handline from Tower [1]. Crews located the basement access from the kitchen and proceeded to make their way to the basement of the home. Upon entering the basement, fire was found in the laundry room of the home. Interior attack teams extinguished the visible flames and then called for ventilation to help with low visibility. After requesting ventilation, heat intensified at a rapid rate downstairs, forcing attack teams to pull out of the basement to the main level of the home. After reaching the top of the stairs, interior crews noted extreme heat now on the main level. Heavy, thick smoke conditions blinded attack teams, causing them to take shelter in the kitchen of the home. Fire was observed to be above firefighters. Original egress was no longer an option due to dark smoke and fire. The interior teams attack line was burned and rendered not usable. Crews recognized the rapid change and bailed out the kitchen window due to extreme heat and smoke conditions. Two of the three crew members suffered minor injuries. Approximately twenty seconds after crews bailed out, the kitchen floor where we were standing collapsed into the basement. The flashover was believed to be caused by extreme heat building in a couch on the main level of the home. When the ventilation fan was placed to the front door, it is possible that the rush of fresh air helped to fuel the smoldering couch and ignited a fire.

Lessons Learned

Our department teaches us to recognize rapid change. In this instance, our bailout training helped with confidence to not hesitate and to bail out. Another important point is that the flashover occurred approximately five minutes after fire was deemed "out." Crews were venting the structure when the flashover occurred. There is a rule of thumb that fifteen seconds of PPV will help to reduce flashover conditions, but in this case,

three minutes of fresh air helped to fuel the flashover. It's important to never let your guard down when on the fireground.

Report Number: 06-0000441
Report Date: 08/23/2006 09:36

Synopsis
Firefighter experiences near miss in flashover trailer training.

Demographics
Department type: Combination, Mostly paid
Job or rank: Fire Fighter
Department shift: 24 hours on - 48 hours off
Age: 25 - 33
Years of fire service experience: 4 - 6
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: 09/05/2005 09:00
Hours into the shift: 0 - 4
Event participation: Involved in the event
Weather at time of event:
Do you think this will happen again? Yes

What were the contributing factors?
- Equipment
- Situational Awareness

What do you believe is the loss potential?
- Life threatening injury

Event Description
Our station had been assigned for multiple company training at the fire academy that day. When we arrived, we were told that we would be doing flashover training along with other training throughout the day. The flashover simulator was the first event of the morning. The weather was sunny, clear skies and moderate heat. When we prepared for the event we were given alternate facepieces to use that were for training purposes only and helmets that were for the same uses which had special hoods on them for heat protection. The facepieces and helmets that were given to us were ones that had been used numerous times in high heat environments. Some were pretty charred up.

The placement of the firefighters in the simulator was decided by the officers. The rookie and I were placed in the front of the simulator closest to the fire so that we could readily observe the fire behavior. The temperature in the simulator was mild but getting hotter as the fire progressed. For a few minutes the drill seemed to be going as planned. There were probably two or three simulated flashovers that had occurred and been cooled when the temperature began to get really hot all of a sudden and the conditions seemed to be worsening rather quickly. The stoker began to call for the vent to be opened. He was informed that it already was. I can remember hearing my officer stating over and over that it was getting really hot and that it was too hot. At this point, the fire was actually coming down on me and the rookie with some intensity. I can recall my hands and shoulders burning like they were melting off. I can also recall thinking it was cool to be able to actually see the fire up so close and see what it would have felt like. I also recall smelling what I thought was smoke or byproducts through my mask. It smelled like burning plastic but I thought nothing of it because I thought that it was a leak of some sort in my seal. The stoker is getting really excited now and screaming for someone to open the door because the heat was incredible. My officer was already on the floor and instructed me to get down as well due to the heat. The smoke right now is really thick and you could see little flickers of fire rolling overhead so you knew that flashover was imminent. Within seconds of getting on the floor, the flashover occurred and I was able to look up at the fire since it was right on top of me and see through my face piece (something I had not been able to do because of the amount of smoke). It was at this point that I realized that my facepiece was melting right in the middle just above the nose cup. I immediately told my officer that my facepiece was melting and he started screaming for me to get out. I can remember feeling like he was over reacting because I really didn't think it was a big deal nor did I realize just how close I was to being fatally hurt. Also being the only girl in the event, I didn't want anyone to feel that I had ruined it for everyone else or that I couldn't handle the heat. Once I was ordered out of the simulator, I covered my facepiece with my hand and exited immediately. The drill was then called and everyone exited the simulator. After it was all over and everyone was out of the simulator the rookie showed me that he had sustained a decent sized second degree burn to the shoulder that was closest to the fire. He never reported it because he didn't want to draw attention to himself and begged me not to say anything telling me that he was fine. I did not sustain any major injuries from the drill. I had some first degree burns to my hand, shoulders, and face; but the potential for a severe respiratory burn was definitely there. According to my officer, I had about 3-5 more seconds before my mask would have opened up and exposed me to seriously high heat. Upon inspection of the mask which I still have, the melted plastic was about 2-3 inches around in a circle and bubbled all the way through to the inside with bubbling and charring on the outside as well.

Lessons Learned

I learned that if you smell plastic that you should attempt to look and see if your mask is compromised. I will never forget the smell or the experience. Always tell someone and never be ashamed to leave. Your life could depend on it. I also learned that when it feels too hot, it probably is.

Report Number: 08-0000657
Report Date: 12/19/2008 20:02

Synopsis
Exit stratagies pay off during training.

Demographics
Department type: Combination, Mostly paid
Job or rank: Captain
Department shift: 24 hours on - 48 hours off
Age: 43 - 51
Years of fire service experience: 24 - 26
Region: FEMA Region V
Service Area: Suburban

Event Information
Event type: Training activities: formal training classes, in-station drills, multi-company drills, etc.
Event date and time: 12/06/2008 10:30
Hours into the shift:
Event participation: Involved in the event
Weather at time of event: Cloudy and Snow
Do you think this will happen again?

What were the contributing factors?
- Situational Awareness
- Weather

What do you believe is the loss potential?
- Property damage
- Minor injury
- Lost time injury
- Life threatening injury

Event Description
Brackets [] denote identifying information removed by the reviewer.

This incident occurred on December 6, 2008. We were lead by captain [name deleted], myself, five other instructors, and ten recruit students from local suburban fire department. The day was winter weather conditions with cloudy skies and a light snow was falling. The temperature was 30 degrees with northwest winds at 25 mph gusting to 30 mph.

We were operating a phase 1 flashover chamber for the recruit class. We were conducting the third of four chamber burns. The chamber fire room was lined with 12"x4'x8' particle board on three walls and the ceiling. A burn drum that was packed with newspaper and pallet pieces was used to start the burning process. All members

were in complete PPE/SCBA and on breathing air at the time the incident occurred. The personnel inside the chamber observation room consisted of six students, two backup instructors at the rear with safety hose line, an instructor operating the vent opening, and myself as the instructor with charged handline for control. The burn barrel was ignited and began the fire growth. The smoke began to thicken and bank down to our lower level just at the top of our helmets. I was not experiencing any level of heat and could visually see the barrel burning. As the smoke increased and the visibility of the fire diminished, I felt the conditions were ready to attempt a pull and develop the first flashover. I ordered the vent open and after about one minute of time, fire fighters began to emerge above and approach our location. Twenty seconds after the burn room flashed, I ordered the vent closed. I then began the penciling technique to control the fire and reduce the flashover back to free burning only. I ordered the students to rotate and it was at this point, I heard the vent instructor ordering everyone out. I turned my head to look and inquire what was happening, when I saw the entire area behind me engulfed in flames from the ceiling to the floor. I began to pencil again to reduce the temperature as everyone exited. The fire immediately went out and was reduced to smoke. All students and instructors, except me, had escaped. Fire instructor [name deleted] returned to ensure I was alright. I replied I was fine and that the fire was knocked back and had subsided to the barrel. Injuries amounted to one individual with minor first degree burns to his hands. I received discoloring to my bunker coat right shoulder and the American flag on my coat had burned. No other injuries or damage to PPE occurred. The fire was extinguished and all personnel gathered for a debriefing and safety checks.

Lessons Learned

Lessons that we learned was the advancement of PPE allowing firefighters to go deeper into a fire area does exists and can prevent you from feeling the true temperature levels around you. In addition, the ability for flammable gases from off gassing products, can build up around you without anyone noticing them. When these gases find an ignition source, this can have a sudden impact on the firefighters in that type of environment. Preventing this type of condition from happening, may be as simple as testing the ambient air temperature with a monitor. This would ensure the temperature isn't at extreme levels which can cause auto ignition.

The weather conditions outside can play a role with the interior environment by not allowing for full ventilation to take place from vent openings.

Even though everyone made it out before severe injury or destruction of PPE, the importance of providing safety measures and exit criteria prior to training is very important. Had the students and instructors not planned for emergency egress prior, this could have been a far more dangerous situation then it was.

Report Number: 09-0000990
Report Date: 11/14/2009 10:32

Synopsis
Crews caught in roll-over, communications blamed.

Demographics
Department type: Paid Municipal
Job or rank: Battalion Chief / District Chief
Department shift: 24 hours on - 48 hours off
Age: 43 - 51
Years of fire service experience: 21 - 23
Region: FEMA Region VI
Service Area: Urban

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 11/09/2009 03:30
Hours into the shift: 21 - 24
Event participation: Told of event, but neither involved nor witnessed event
Weather at time of event: Clear and Dry
Do you think this will happen again? Yes

What were the contributing factors?
- Decision Making
- Situational Awareness
- Communication

What do you believe is the loss potential?
- Life threatening injury

Event Description
Our department was dispatched to a structure fire reported by police who were initially dispatched to a burglar alarm. First companies arrived to find a two story, wood frame multi-use structure with moderate smoke issuing from the structure. After forcing entry, the engine company (three person hose team) entered with an inch and three-quarter attack line and a TIC. The crew reported high heat conditions and indicated that the TIC screen was red! They proceeded to the right and pushed to the rear of the structure with heavy black smoke but no visible fire. A rescue company (2 person team) entered shortly after the engine company. They too reported extreme heat at the floor and a Red screen on the TIC. The rescue crew also proceeded to the right and pushed to the rear.

Outside, the IC and ladder company crew observed smoke conditions rapidly changing from laminar light brown smoke to a turbulent black smoke pushing from the entry doorway. At this time, IC attempted to contact the initial engine company without success.

Back inside, the rescue crew reached the engine company at the rear wall. They all reported the same high heat conditions with no visible fire. Some confusion occurred when personnel mingled together and at some point, the rescue crew lost contact with each other. The engine captain also lost track of one of his two rookie firefighters. One of the rescue members retreated outside and reported he had lost his partner. At the same time, the engine captain attempted to radio IC that he too had lost a member of his crew and to report the condition encountered inside.

Back outside, the IC ordered the ladder company to "vent" a large window on the A Side of the structure. As this window was vented, the ladder crew observed fire at the floor level and it rolled across the room toward the rear of the structure.

The captain of the engine observed the fire roll over head and ordered his crew to evacuate. He reported extreme heat and made a hasty exit out of a window. Upon exiting, he reported that he had lost his crew and a MAYDAY was called. Almost immediately, all interior crews were accounted for at the entry doorway. The engine captain sustained 2nd degree burns to his face. No other injuries were reported. Crews quickly regrouped.

Later arriving companies were assigned to the fire attack, and the fire was quickly contained.

Lessons Learned

Communications: The interior crews had some difficulty with the radios inside. The radio seemed to work fine. User errors lead to the problem. Better training in the use of the radio will correct this issue.

Situational awareness: All personnel on the interior crews failed to recognize the conditions they were entering. While it was during the early morning hours, better education and understanding of fire conditions and behavior would prevent this error in the future. During a critique, the involved personnel recognized the conditions and agreed they should have made some tactical priority changes prior to entering.

Decision making: The decision to vent the window once the conditions were recognized was a risky one at best. This action most certainly prevented a flashover that could have resulted in a catastrophic event for the interior crews. However, this decision placed the interior crews in extreme danger. The decision to vent should have been communicated to the interior crews so they could be prepared for the change in the environment.

All involved personnel did an extraordinary job and reacted to the changing conditions accordingly. The mayday was called immediately in accordance with department policy and a RIT team was in place and prepared when the MAYDAY occurred. Our department has recently increased training in situational awareness, communications, and size up. This training did aid in recognizing the changing conditions but additional training will occur.

Report Number: 09-0000112
Report Date: 02/03/2009 10:05

Synopsis
FFs suffer minor burns in flashover.

Demographics
Department type: Paid Municipal
Job or rank: Lieutenant
Department shift: 24 hours on - 48 hours off
Age: 34 - 42
Years of fire service experience: 7 - 10
Region: FEMA Region IV
Service Area: Suburban

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 07/05/2008 15:30
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
- Situational Awareness
- Human Error
- Teamwork
- Individual Action

What do you believe is the loss potential?
- Life threatening injury
- Property damage

Event Description
Units were dispatched to the report of a house fire with heavy flames and smoke showing. I was the officer on the squad/heavy rescue with a crew of 4 firefighters. Upon our arrival, I observed a one-story single-family dwelling of ordinary construction. There was moderate to heavy grayish black smoke issuing from an open front door and from the eaves. My unit was tasked with fire control/attack and I was also assigned as the interior sector officer. As a company, we had been on eight working structure fires in the previous five shifts. We were really on our game.

We entered the structure with a charged hoseline, tools, thermal imaging camera, and a five man crew. A secondary attack line was at the door (charged and staffed) awaiting the order to proceed. I divided the interior group into two crews so they could search

for the seat of the fire. We had been given the all-clear by the homeowner. There was no need for us to incur extra tasks (conducting primary and secondary searches) because there were no civilian life safety issues.

The interior conditions experienced low to moderate heat and good visibility up to 6-7 feet. As we were pulling ceilings in an attempt to find the seat of the fire, I heard a faint crackling sound and ordered the interior crews to stop and listen. We tracked the sound to a door that was leading to a converted garage with 15 foot ceilings. The windows were blackened, giving us a clear indication that there were possible backdraft conditions in that room. I called on the radio for ventilation to be coordinated with our fire attack. Command sent crews to the wrong set of windows. When we opened the door and began to advance, I noticed that the entire room was burning around us. Just as I was ordering crews to retreat and regroup, a wall of flame came rushing toward us and the force of the flame knocked three 225 pound men flat on their backs. We were fortunate to be retreating when the flashover occurred. Although we all suffered minor first and second degree burns, it could have been a lot worse.

Lessons Learned
Situational awareness is of the utmost importance in critically dangerous situations and during routine operations.

A properly coordinated fire attack can mean the difference between a successful stop on a fire and flags flying at half staff. I would suggest that we all need to train on ventilation and fire attack in tandem.

Report Number: 10-0000301
Report Date: 02/20/2010 20:44

Synopsis
Live fire training damages equipment.

Demographics
Department type: Paid Municipal
Job or rank: Fire Fighter
Department shift: 24 hours on - 48 hours off
Age: 25 - 33
Years of fire service experience: 4 - 6
Region: FEMA Region IV
Service Area: Suburban

Event Information
Event type: Training activities: formal training classes, in-station drills, multi-company drills, etc.
Event date and time: 02/02/2010 00:00
Hours into the shift: 5 - 8

Event participation: Involved in the event
Weather at time of event: Cloudy and Rain
Do you think this will happen again? Uncertain

What were the contributing factors?

- Procedure
- Training Issue
- Situational Awareness

What do you believe is the loss potential?

- Lost time injury
- Property damage
- Minor injury
- Life threatening injury

Event Description
During a mutual aid live fire training evolution, twenty firefighters including myself were put in a shipping container. The proctors then proceeded to light pressure treated plywood on fire. The object of the drill was to use the thermal imager and watch the process of a flashover. During the drill, firefighters were to change spots from front to back, but being that there were such a large number of us in the shipping container movement was not possible. The container was heated to above twelve hundred and fifty degrees with us being in the container between twenty to thirty-five minutes. After the drill was over, we exited the container and that is when I found that my fire jacket was partially burned and my face shield to my mask was melted with stress fractures.

Lessons Learned
In my opinion, fewer firefighters should have been placed in the container so that movement was possible. Additionally, the length of time in the container could have been less.

Report Number: 07-0000735
Report Date: 02/19/2007 13:13

Synopsis
Flashover fire in mobile home.

Demographics
Department type: Combination, Mostly volunteer
Job or rank: Fire Chief
Department shift: 24 hours on - 48 hours off
Age: 25 - 33
Years of fire service experience: 4 - 6
Region: FEMA Region V
Service Area: Suburban

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 02/16/2007 01:00
Hours into the shift: 17 - 20
Event participation: Witnessed event but not directly involved in the event
Weather at time of event: Cloudy and Snow
Do you think this will happen again? Yes

What were the contributing factors?
- Decision Making

What do you believe is the loss potential?
- Lost time injury
- Minor injury
- Life threatening injury

Event Description
We were dispatched to a reported mobile home fire. We arrived on-scene 7 minutes after dispatch. We found the rear and middle of the trailer fully involved. We were advised by PD that there was a good possibility of occupants in the structure. There was a vehicle in the driveway and footsteps in the snow going to the front door.

The crew was masking up on the front porch and preparing to enter to conduct a search. The crew had one 1 3/4" line. Two firefighters along with the truck captain were masked up. The chief arrived on-scene, conducted a 360 degree walk around, and established command.

Two firefighters entered the front door and began suppression efforts with water flowing.

Command had arrived on-scene just prior to crew entering. Command ordered crews out of the structure. No sooner had command ordered the crews out, a flashover occurred to the front room of the trailer where the two firefighters had entered.

The captain was at the door and yelled for the firefighters to exit. One firefighter exited quickly, fell down the steps, and was assisted by the captain.

The second firefighter exited but was standing at the doorway somewhat disoriented. The Incident Commander (IC) had exited his vehicle and ran to the doorway.

As the second firefighter exited, he had visible fire to his arms. The IC grabbed the handline, extinguished the firefighter, and pulled him off the porch onto the ground. The IC then radioed for a paramedic unit.

Upon assessing the firefighters one had no injuries or any noticeable damage to his gear. The second firefighter had a small second degree burn to both ears. He also had hair singed on the rear of his head at the base of his hairline.

Both firefighters were wearing full PPE. The second firefighter had noticeable charring to the arms of his coat and discoloration to the entire rear of the coat. The helmet was soot covered and the shields were melted. His hood had discoloration and some charring in four places; two spots near each ear. The SCBA was soot covered but had no apparent damage and tested fine.

With the information given by the police along with visual indicators, it did appear that the trailer was occupied. As it turned out, the occupant and her child had moved out of the trailer a week prior due to frozen pipes and were staying at another location.

The crew members followed policy upon entering to conduct a rapid search. Command had noticed a change in the smoke color and ordered the crew out. Total time in the structure for the crew was less than a minute.

Both crew members self extricated themselves. The second firefighter stated that he had seen the room go completely red with fire and grabbed the first firefighter to pull him out. The first firefighter stated he did not realize the room had flashed over and his vision was completely obstructed by the heavy black smoke and soot.

The captain along with the IC and engine operator all assisted with extinguishing and rendering aid to the two other members. The first firefighter was checked by paramedics and released. He assisted with the remainder of the suppression.

Lessons Learned
Lessons learned: Wearing of full PPE, having personnel in place to immediately assist the crew that enters.
Suggestions: Prior to entering any structure make a good visual inspection of the smoke conditions. The smoke went to a very dark, heavy brown just prior to flashing over.

Report Number: 09-0000143
Report Date: 02/06/2009 11:25

Synopsis
Flashover just before crew enters.

Demographics
Department type: Paid Municipal
Job or rank: Fire Fighter
Department shift: 24 hours on - 48 hours off
Age: 34 - 42
Years of fire service experience: 11 - 13
Region: FEMA Region V
Service Area: Suburban

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 07/01/2007 00:00
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?
- Command
- Training Issue

What do you believe is the loss potential?
- Life threatening injury

Event Description
This event took place in a 2-story, approximately 2000 square foot residential home, with an attached 2 car garage. This structure was built in the 1980 era with an open floor plan.

The dispatch went out for a report of a fire across the street from the reporting party with smoke showing. The local police department marked on the scene and advised (per the neighbor) there were a mom and infant inside the home.

Approximately 3 minutes later, three engines with three personnel each arrived on the scene (we were conduction training and came from the same location). The fire was located on the "C" side sector one. Engine [1] was to take a 1 ¾ line to the fire area. Engine [2] was to search the room to the left of the fire room and away from the fire. Engine [3] was to go upstairs and search above the fire. Once inside the front door, engine [1] (with one fire fighter and a fire fighter riding out of class) went approximately 15 feet and stopped. Engine [2] and engine [3], both consisting of one lieutenant and one firefighter, were backed up behind engine [1]. Engine [1] had an issue with some doors and was not able to open the doors to the burn area. Within about 30 seconds or so, the smoke banked down to zero visibility and the heat was unreal. My lieutenant and I recognized the situation and began to get everyone out. Someone (I am unsure of whom) placed a PPV fan in the front door where we entered and someone else took out a window that was located 5 feet to the right of the front door. As I exited the structure, I was still on the front porch and looked back as the entire first floor ignited.

Lessons Learned
I realized not everyone is aware of flashover conditions or aware of how and where to ventilate.

Report Number: 05-0000666
Report Date: 12/22/2005 15:20

Synopsis
Flashover traps firefighters on 2nd floor. Forces bail-out.

Demographics
Department type: Volunteer
Job or rank: Driver / Engineer
Department shift: Respond from home
Age: 43 - 51
Years of fire service experience: 27 - 30
Region: FEMA Region II
Service Area: Suburban

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 02/09/2003 13:10
Hours into the shift: 0 - 4
Event participation: Involved in the event
Weather at time of event:
Do you think this will happen again? Yes

What were the contributing factors?
- Individual Action
- Accountability
- Staffing
- Command
- Communication

What do you believe is the loss potential?
- Life threatening injury
- Lost time injury

Event Description
On February 9th 2003, I was involved in a flashover that took seconds to erupt. While driving the ladder truck to a reported structure fire, a confirmed working fire w/possible entrapment report came from the first arriving chief. I radioed command to see if we were going to stick the building. The chief requested forcible entry first since the 9-1-1 call originated from within the structure.

I donned my PPE and met the assistant chief at the Exposure A" entry door, already opened by the police department. This was the given address only to be the Exposure "D" Side. Together with the rest of the truck crew, 2 firefighters, we searched the first floor. Found heavy fire in a bedroom, B-C Corner, with extension to a center room "C" Side where the second floor stairwell was located. No victims were found on the first

floor. Soon after, I brought the firefighter with the nozzle, a charged line, to the center room with the stairwell.

Since he was alone, the ladder crew backed the line up and the assistant chief and I proceeded to the second floor, myself going first. The confirmed entrapment was on the second floor. When I got to the top of the stairs with my left hand on the wall, I inadvertently walked into the pitch of the roof that occupied most of the hallway. It knocked my helmet, mask & hood off. I calmly removed my gloves, replaced my PPE and before I could reach my gloves, I had placed between my feet, is when my partner reported the fire rolling over our heads. Within seconds it flashed, consuming us in fire from ceiling to floor. We backed away, but with all the rooms being locked we had no place to escape. I then told my partner I was going to try the windows that were at the top of the stairwell on the "D" Side. At first I tried using my elbow to break the window and then my helmet. It didn't break! Found out later on they were made of plexi-glass.

I then retreated back to where my partner was and told him we were going to die here. With one last effort, I told my partner I was jumping out the window. I remember thinking that the weight of my airpack and strength of my helmet, I could break the glass. I don't remember hitting the window, only seeing the outside of the structure and dangling from the window sill. I could hear people, spectators, screaming and the voice of a firefighter below me telling me to, “Let go. I'll catch you". After hearing him the second time I let go! He caught me and together with two police officers, they dragged me away from the structure. The whole time I kept telling him my partner was right behind me. Finally, about 30 seconds later my partner found his way to the open window, but wouldn't jump. Within seconds, a portable ladder was raised to him, where he descended head first. We were both transported to the trauma center, evaluated and later airlifted to the burn center. My partner spent eight days there and I spent a month. Two weeks were spent in the Burn ICU, and two weeks in the Step-Down Unit. It is almost 3 years later and I'm still having surgery to my hands.

Lessons Learned

A lot can and will go wrong at fire scene. Foremost I think accountability and situational awareness on the part of the incident commander is most important. Do you risk your personnel when the survivability of the tenant is questionable? Second, make sure the personnel riding the equipment are experienced and confident in the tasks they are about to take part in. In this event, the chief had no idea I was trapped along with the firefighter from his station. The nozzleman had left the line in heap at the foot of the engine, which afterwards wound up kinking the hoseline. Also, if you are the driver/operator of the engine, be sure to check the hand lines before charging them. I also wish to mention that through this whole event, my partner and I never lost contact with one another except after I broke through the window. Practicing self-rescue methods and keeping a calm head contributes to your safety. Knowing where your means of egress are and remembering how you've gotten to where you are is very important. Having a RIT in place may not always me able the reach you. Having tools and a TIC (thermal imaging camera) are very important, but may not be useful.

Report Number: 11-0000205
Report Date: 05/26/2011 00:28

Synopsis
Officer alerts crews to flashover danger.

Demographics
Department type: Paid Municipal
Job or rank: Fire Fighter
Department shift: 24 hours on - 48 hours off
Age: 25 - 33
Years of fire service experience: 7 - 10
Region: FEMA Region VIII
Service Area: Urban

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 05/01/2004 17:00
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?

What do you believe is the loss potential?

Event Description
Note: Brackets denote reviewer de-identification.

We responded to a house on fire. As we arrived, nothing was showing. We began to investigate and conditions inside were just like they are as you are reading this with a light odor of smoke. We began to poke investigation holes into the walls and after about ten minutes there was a slight haze building. More and more crews entered to assist in finding the hidden fire. The longer it took the more smoke started to build. After twenty minutes into the fire, smoke was banked to the ground and heat was significant but there was no visible fire. As we continued to search, all of the firefighters in the house became bottle-necked in the upstairs hallway. We were tight and hot and I remember seeing little flurries of fire in the floor boards. About ten seconds later the captain on Engine [1] yelled for everybody to get out because the fire was going to flash. It did and I will never forget that feeling or sound for the rest of my career. All firefighters were able to get out without injury prior to the flashover. Captain [A] saved lives that day and I am forever in his debt.

Lessons Learned
The fire was in the floors and we never checked it. The IC kept sending more and more guys into the house and it actually hindered our ability to rapidly identify the fire. We

now have thermal imaging cameras and hopefully this won't happen again anytime soon.

Report Number: 06-0000292
Report Date: 05/24/2006 09:04

Synopsis
Communications problems at structure fire result in crews becoming separated and almost trapped.

Demographics
Department type: Volunteer
Job or rank: Other : Past Chief
Department shift: Respond from home
Age: 34 - 42
Years of fire service experience: 17 - 20
Region: FEMA Region III
Service Area: Suburban

Event Information
Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 12/02/1995 03:00
Hours into the shift: 0 - 4
Event participation: Involved in the event
Weather at time of event:
Do you think this will happen again? Yes

What were the contributing factors?
- Accountability
- Training Issue
- Communication
- Command
- SOP / SOG

What do you believe is the loss potential?
- Life threatening injury

Event Description
(Deleted) fire companies from 3 neighboring cities, along with several emergency medical units were dispatched for a building fire with numerous subjects trapped. The building was a three story, brick frame structure with a total of 18 apartments. The floors were served by an open stairway at the front of the building and a closed stairway in the rear. A long hall on each floor that split the apartments from side to side connected both stairways. The first floor was half set into the ground at all sides.

I responded from our station as the Captain on the first due ladder truck. I had a crew of five fire fighters including the driver and myself. As we responded, Chief Officers advised that several persons were trapped and more were jumping from upper story windows. Our apparatus was the first to arrive on scene and I observed heavy fire conditions involving the entire front stairway. We placed our apparatus in front of the building to reach the third floor. Several police officers assisted my crew with positioning ground ladders to trapped occupants on all sides of the building. While one of the rescues was being conducted, a subject jumped from a third floor window and struck a fire fighter half way up a ground ladder. The fire fighter was able to maintain his grip on the ladder, but the occupant fell to the ground.
Another rescue attempt was made at a third floor window. The window was approximately seventy percent involved in fire. It had been reported that a subject had been seen just minutes before at the window. Without the protection of a hoseline, fire fighters from my crew and I attempted to gain entry into this window. We were unable to do so and had to back out. While my crew was making a third rescue from a window the Assistant Chief of a neighboring fire company advised me that there was an invalid trapped in a second floor apartment. I accounted for my crew and we entered the rear stairway.

At the second floor landing, we located the first-in engine crew from another department. They had pulled a 1-¾ inch hand line to the landing and were attacking the fire in the second floor hallway. I observed heavy smoke conditions from the third floor above us and moderate fire conditions in the second floor hallway. I advised these two fire fighters of our orders and had both crews enter the hallway. One of the fire fighters from my crew took over as the nozzle man. The two others each partnered with a fire fighter from the other department. Each pair began primary searches on either side of the hallway as I pulled more hose into the hall and the nozzle man moved forward. After the first two apartments were searched, all of us moved down the hall to the next set of apartments.

While crews were searching in these apartments, I observed the ceiling behind us collapse into the hallway and onto the hoseline. At this time I made an attempt to call the incident commander to notify him of our position and of the collapse. I called for him and he did not immediately reply. Moments later I did not heard the incident commander calling me. As crews came out of the second set of apartments I attempted to call again, but there was no answer. After reviewing the audiotape, which I still have, several other units and Chiefs are heard discussing exposure problems, electric problems, notification for fire marshals, and the Red Cross. All while my crew is searching for reported people trapped on the same channel.

Assuming that the Chiefs could not hear me I removed my Scott SCBA regulator from my facemask and attempted to call again. On the audiotape these calls are heard, but not answered. While making this call I fell into the floor, my legs were dangling into the first floor. The only thing keeping me from falling through was that my air pack was wedged between the floor joists. It was later reported to me that the first floor hallway was involved in fire. I quickly scrambled to locate my loose regulator. Once I had the regulator back in place I yelled for everyone to bail out of the building. As the crews

returned from searching the last set of apartments they too fell into the floor. I could feel that firefighters were next to me in the floor. I heard a crash and the fire fighter to my left slumped over onto me. Another firefighter later reported that a piece of wood had fallen and struck this fire fighter on the head. I called again for the incident commander, this time screaming into the radio.

The audiotape is very hard to understand. Several seconds went by and I could not make contact with any other fire fighters any more. I did not know what happened to my crew. Suddenly the heat started to build up. It became unbearable. I leaned forward as much as possible and reached for the bale of the nozzle I assumed was still in front of me. I was able to get my fingertips on the bale and pull it back, opening the nozzle above my head. I now had to make the biggest decision in my life. Either I had to stay and try to make sure my crew was getting outside or go out the way I came in. Without being able to make contact, either verbally or physically with any other fire fighters I decided that I had to get outside to get help and regroup, and then I would be able to help them. Every decision I make on the fireground, every thing I teach to other fire fighters reminds me of this moment. I left my crew! To this day, I do not remember how I was able to get out of the floor, I just know that I did and I started following the hoseline out. Then I reached the area that had collapsed behind us. It was at this point that I started thinking about what was going on.

Everything else I had done was from my training. Making the ladder rescues, accounting for my crew, assessing fire conditions, attempting to communicate, advising everyone to get out, reaching for the nozzle, and knowing that I had to leave to stay alive was all training. Now I realized that I had a real need to get outside. I remembered that I was in a hallway and continued to proceed straight ahead. Several feet later, I reached the rear stairway and made my way out of the building. A moment later, I was able to reach the incident commander by radio and advise him of the interior conditions and the unknown status of my crew.

He reported that crewmembers had exited the front of the building. They exited over a roof ladder that had been placed over the burnt out stairway in the front of the building. Some others left via windows from apartments on the second floor. A fire fighter that was unconscious was carried out and had regained consciousness when they reached the exterior. Crews in the front of the building were amazed; no one had advised them of our crew's position. No one came to their aid. None of my crew was ever checked by emergency medical services. Fire fighters in the front of the building had attempted to gain access through the stairway without success. After my crew had exited, they placed a 2 1/2 line into the stairway without knowing that I was still in that hallway. This was when the heat came down on me.

Lessons Learned

I have reviewed this incident in my mind thousands of times. For two years after this incident I stayed away from the interior of buildings. Not until I was training in a flashover simulator was I able to really get back my confidence. Since this fire several changes have been made with the way our company operates. We have rapid intervention teams. We have rehab sectors. We have improved our incident command

system and have more training. Most importantly we now teach fire fighters to transmit messages without waiting for a reply. I had been trained to call first, get a response, and then continue with my message. Even though Chiefs sometimes answered me, they never knew the gravity of the situation until after it was too late. Some Chiefs even continued to transmit while the fire radio was attempting to clear the air so I could report the interior conditions and the unknown status of my crew.

I think that if I had just transmitted our location and that we were in trouble, several times, outside crews would have received it and then could have responded to our needs. Our department now teaches fire fighters to use "Mayday" and we are working on a countywide twenty-minute mark system. All Chiefs and incident commanders around the world need to remember that their radio message may not be the most important thing on the fire ground. Let those who are working the interior and roof use the radio when they need it. It may be the last chance they have.