



National Fire Fighter Near-Miss Reporting System Reports Related to Troubleshooting Pump Operations

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Report Number: 05-386
Report Date: 08/03/2005 1628

Demographics

Department type: Volunteer
Job or rank: Fire Fighter
Department shift: Respond from home
Age: 16 - 24
Years of fire service experience: 0 - 3
Region: FEMA Region IV
Service Area: Rural

Event Information

Event type: Non-fire emergency event: auto extrication, technical rescue, emergency medical call, service calls, etc
Event date and time: 07/12/2005 0024
Hours into the shift: 0 - 4
Event participation: Witnessed event but not directly involved in the event
Weather at time of event:
Do you think this will happen again? Uncertain
What were the contributing factors?
What do you believe is the loss potential?

Event Description

The call was a structure fire. Department 3, Department 2, and the Prison Department were dispatched. Department 3 was the primary department. Upon arrival, two (2) 1.5 inch hoses were pulled from the engine. Department 2 then arrived and one of their members was assigned to operate our engine's pump panel. Due to a lack in volunteers and the (pump) panels being exactly the same on every engine, we combine teams. At that time, command decided to use the deluge gun on that engine. After approximately five minutes of using the deluge gun, command ordered it shut down until the smoke and air cleared so we could determine if our aim was correct. The pump operator however, did not radio to the volunteers on the hoses that he was about to shut down the deluge gun. Anyone with experience knows that upon shutting down an output of water at the panel will cause increased pressure on all other hoses and equipment.

The operator pushed the knob for the deluge gun in hard, causing a sudden surge of pressure on the two hoses. One volunteer lost control of his hose. It hit his helmet shield and then his arm & hand after he placed his arm and hand in front of the broken shield to prevent himself from being hit in the face. He then threw himself onto the hose, taking control until it was shut down. He was later taken to the ER where they determined he broke his arm in three places and broke two fingers.

Lessons Learned

Shutting down output sources, hoses/guns, will caused a surge in pressure. Ease the valves shut and radio into the people on the hoses and guns so they will be ready. More training will help prevent a similar event.

Report Number: 05-495
Report Date: 08/30/2005 1854

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: 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: 08/30/2005 1330

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?

- Communication
- Situational Awareness
- Human Error

What do you believe is the loss potential?

- Life threatening injury
- Property damage

Event Description

Our engine and truck company were participating in probationary firefighter training for our newest firefighter on the shift. The drill entailed establishing and flowing an elevated master stream through our 105' pre-piped aerial. Also being trained is a relatively new firefighter who is being qualified as a back-up engine driver/operator. Because this was a familiarization-only drill, a single 20' pony sleeve of 4-inch hose was used to connect from the engine to the aerial's waterway intake. The gate was closed on the aerial side of the hose.

What followed was a series of communication errors and human errors. Due to a miscommunication from earlier in the morning, the firefighter operating the pump panel mistakenly thought that the starting pressure for the operation was to be 225 psi, our starting pressure for aerial master streams is 150 psi. In addition, the aerial turntable operator had the intake gate closed. The firefighter on the pump panel thought that the truck crew had stated they were "ready for water." In fact, they were not. The pump operator opened the gate valve on the pump outlet, and began to increase pressure on the line. Within 5 seconds, a loud "pop" was heard. The engine officer and two truck company firefighters were standing within 20 feet of the apparatus. None had their helmets on. With the "pop" noise, the 4-inch hose failed at the coupling immediately behind the (unisex) connection on the truck's waterway intake gate. The metal collar that holds the hose onto the (unisex) coupling flew off the hose as it initially whipped when it came off of the truck, and it narrowly missed striking the

engine captain who was standing nearby. Luckily, no one was hurt in this event and property damage was limited to the 4-inch hose and its (unisex) coupling.

Lessons Learned

1. Whenever pumping apparatus and/or aerial apparatus are being used, all participants in the immediate area of the equipment should at least be wearing helmets and leather gloves.
2. Assure before starting a training evolution that all participants fully and completely understand their roles and responsibilities. For new trainees, assure that an experienced member is overseeing their activity.
3. Consider a "challenge and response" means of communication. In this case, if the pump operator had taken a second to assure that the truck operator was truly ready for water, the event may have been avoided.
4. Know the limitations of all equipment you are using either in operations or training scenarios and never exceed manufacturer-recommended specifications. The hose in this case had stamped on it "Test to 200 psi" yet the pump operator thought the pump pressure should be 225 psi.
5. Establish a "safety perimeter" around training evolutions and keep non-active participants outside of the perimeter.

Report Number: 06-565
Report Date: 11/15/2006 0012

Demographics

Department type: Paid Municipal
Job or rank: Battalion Chief / District Chief
Department shift: 48 hours on - 96 hours off
Age: 43 - 51
Years of fire service experience: 24 - 26
Region: FEMA Region IX
Service Area: Suburban

Event Information

Event type: On-duty activities: apparatus and station maintenance, meetings, tours, etc.
Event date and time: 11/03/2006 1100
Hours into the shift: 5 - 8
Event participation: Witnessed event but not directly involved in the event
Weather at time of event:
Do you think this will happen again? Yes
What were the contributing factors?

- Decision Making
- SOP / SOG
- Procedure
- Individual Action
- Command

What do you believe is the loss potential?

- Lost time injury
- Life threatening injury

Event Description

During annual hose testing, a 4" section of hose failed next to the pump panel where the a firefighter was standing. The 4" hose separated from the pump panel due to a failure of the two 1/2" elbow that the 4" hose was attached to. The end of the 4" hose was free from the pump panel, along with the 2 1/2" elbow and 2 1/2" to 4" reducer. This struck a nearby Firefighter in the side of his head causing a skull fracture and facial fractures requiring surgery to repair.

Lessons Learned

The injured firefighter was not wearing proper safety gear (Helmet).
FF was unfamiliar with proper hose testing SOP.
NFPA hose testing guidelines were not followed.

Report Number: 06-575
Report Date: 11/20/2006 1640

Demographics

Department type: Paid Municipal
Job or rank: Fire Fighter
Department shift: 24 hours on - 48 hours off
Age: 52 - 60
Years of fire service experience: 17 - 20
Region: FEMA Region V
Service Area: Urban

Event Information

Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.
Event date and time: 11/04/2006 1630
Hours into the shift: 13 - 16
Event participation: Told to and submitted by safety officer
Weather at time of event:
Do you think this will happen again? No
What were the contributing factors?

- Human Error
- Accountability
- Individual Action

What do you believe is the loss potential?

- Lost time injury

Event Description

We had a fire in a large storage building. The engine was assigned the task of pumping into the truck with a 3" line. The line was laid and after some problems at the hydrant, the pump operator introduced pressure into the pump. Another crew prepared a line for truck operations. In doing so, one of the crew members went to the side of the engine opposite of the pump panel and attempted to remove the cap of what he thought was a 5" discharge port. In reality, it was the 6" intake port with a Stortz 5" cap. The firefighter attempted to remove the cap but because of the pressure, he could not remove it. He asked for and received from the pump operator a Stortz wrench to remove the cap. The pressure blew the cap off striking the firefighter who was removing the cap in the wrist area resulting in a fractured wrist. The officer moved toward the pump panel to question why a 5" cap was being removed for the 3" line when the cap blew. The officer did not realize the port was the intake. The officer was struck in the thigh by the cap and knocked to the ground by the force of the stream. He was 12 ft. away when the cap blew.

While the injured firefighters were being treated, the firefighter who was at the plug came up to the scene and placed a 5" hose onto the port. A 3" line was stretched to another engine supplying a deck gun. When the truck called for water, no one could determine why they were not receiving it. No one figured out the 5" hose to the truck was connected to an intake.

Lessons Learned

1. Firefighters and pump operators need to know their equipment.
2. Review this incident departmental wide. All members need to be aware that these things do happen. Officers need to make sure their crew members know the equipment and how it operates. When equipment is not functioning properly, members need to know how to troubleshoot the situation.
3. The Firefighter needs to be held accountable for his actions. This was a rookie mistake made by a Firefighter with considerable seniority. He needs extensive retraining and discipline.

Report Number: 07-913
Report Date: 05/13/2007 2303

Demographics

Department type: Combination, Mostly volunteer
Job or rank: Fire Fighter
Department shift: Duty night (in-station)
Age: 25 - 33
Years of fire service experience: 4 - 6
Region: FEMA Region VI
Service Area: Suburban

Event Information

Event type: On-duty activities: apparatus and station maintenance, meetings, tours, etc.
Event date and time: 05/05/2007 1400
Hours into the shift:
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?
What were the contributing factors?

- Situational Awareness
- Human Error
- Decision Making

What do you believe is the loss potential?

- Life threatening injury
- Lost time injury

Event Description

While hose testing large diameter hose, the operator was attempting to open a mechanical gate valve that is located above the actual pump panel. The valve was stuck closed. In order to get better leverage the operator stood on top of pump panel. While attempting to turn the valve, the operator's foot slipped causing a head first fall off of the top of the pump panel. The operator struck the concrete pavement below, had a short period of unconsciousness, suffered a large laceration to top of his head and broke several bones in his hand.

Lessons Learned

Operators should always wear head protection while working in the fire service at all capacities.

- Do not operate out of the human safe zone of balance.
- Routinely operate all mechanical valves to prevent sticking.
- Seek assistance with task that you are not able to complete.

Report Number: 07-1049
Report Date: 09/10/2007 1124

Demographics

Department type: Volunteer
Job or rank: Assistant Chief
Department shift: Respond from home
Age: 16 - 24
Years of fire service experience: 4 - 6
Region: FEMA Region II
Service Area: Suburban

Event Information

Event type: Vehicle event: responding to, returning from, routine driving, etc.
Event date and time: 03/01/1980 0000
Hours into the shift:
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?

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

What do you believe is the loss potential?

Event Description

Pump shift: Failure to properly engage the pumping mode

Approximate Date: 1980

Apparatus type withheld

While operating at the scene of a room fire at a motel, the first due engine was involved in an accident with the assistant chief's vehicle. The event occurred after the engine arrived on the scene and the operator was attempting to establish a water supply to the first hand line. The engine uncontrollably moved forward into the chief's vehicle while the operator was throttling up the engine at the pump panel. The operator in his haste to increase engine RPM, depressed the red shutdown button on the throttle, and pulled out the throttle – rapidly.

The apparent cause of this was the improper operation of the transfer device from road to pump. This type of engine is equipped with an 8 cylinder diesel engine and an automatic transmission. The pump transfer was an electric transfer switch to move the drive from "road" to "pump". The probable cause was determined to be a combination of operator error and a design deficiency.

Lessons Learned

- The pump operator must verify the proper transfer of the apparatus from road to pump..
- Use the throttle on the pump. Do not depress the emergency shutdown button to cause the throttle to increase rapidly; it is not a desirable application or safe practice.
- Situational awareness of all on the fire scene for unexpected results – it is not expected our vehicles will move once on scene.

Potential/Actual consequences:

In the 1st quarter of 1991 a firefighter was killed in the line of duty in [location deleted] following a similar mishap.