



## National Fire Fighter Near-Miss Reporting System Reports Related to SCBA Valve Mishaps

Report #	Synopsis	Page #
06-081	Properly working SCBA fails suddenly during interior attack, SCBA valve not fully opened.	2
06-166	Failure to open SCBA cylinder completely and poor facepiece seal results in an inhalation injury.	3-4
06-521	Restricted airflow occurs due to SCBA misuse.	5-6
07-784	SCBA cylinder becomes airborne when the valve was accidentally turned.	7-8
07-946	SCBA fails due to partially opened cylinder valve.	9-10
07-1009	Hose line catches SCBA valve shutting it off.	11-12
07-1086	Firefighter doesn't open SCBA valve fully and runs out of air.	13-14
08-257	Horseplay with air bottle turns dangerous.	15
08-516	SCBA bottle shuts down during training.	16
08-605	Changing fire conditions endangers attack crew.	17-18

**Report Number:** 06-081  
**Report Date:** 02/08/2006 1101

### **Demographics**

Department type: Paid Municipal  
Job or rank: Lieutenant  
Department shift: 24 hours on - 48 hours off  
Age: 43 - 51  
Years of fire service experience: 24 - 26  
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: 01/26/2006 1600  
Hours into the shift: 9 - 12  
Event participation: Involved in the event  
Weather at time of event:  
Do you think this will happen again? Uncertain  
What were the contributing factors?

- Other
- Equipment

What do you believe is the loss potential?

- Unknown

### **Event Description**

We arrived at a structure fire at about 15:45. The two firefighters assigned to my apparatus and I donned our SCBA's and made entry into the structure. Before entering, my SCBA was functioning properly. Within four to five minutes, my mask sucked up to my face as I inhaled. This was the first indication that something was wrong. There were a lot of obstacles in the structure that I encountered while we were advancing our handline. It is possible that I bumped the regulator on my mask. I never felt a constant flow that would have indicated I had lost the seal on my mask.

Neither myself nor the firefighter that was on the handline directly behind me ever heard an audible alarm and I did not feel a vibrating alarm. Fortunately, I was near a window and was able to stick my head outside for a breath of air. The SCBA had functioned properly that morning during the daily check and was also working properly when I entered the structure.

### **Lessons Learned**

Fully open cylinder valve any time SCBA is donned and used. Results of evaluation by third party revealed that SCBA cylinder valve was not fully opened before donning. Evaluation of all other components determined unit was working properly. Partially opened cylinder valve prevented sufficient psi to reach regulator and activate low air alarm. Regulator sensed, because of reduced psi, that system was empty and shut down without alarm sounding.

Reviewer's note: Full report will be posted on the Resources Page (a new Near-Miss Reporting System feature coming in April 2006).

**Report Number:** 06-166  
**Report Date:** 03/16/2006 1900

### **Demographics**

Department type: Paid Municipal  
Job or rank: Fire Chief  
Department shift: 24 hours on - 24 hours off  
Age: 43 - 51  
Years of fire service experience: 24 - 26  
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: 02/11/2006 1855  
Hours into the shift: 9 - 12  
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?

- Human Error
- Equipment
- Training Issue

What do you believe is the loss potential?

- Life threatening injury
- Lost time injury

### **Event Description**

Engine crew arrived on the scene of a working structure fire in a single story wood frame residence. On arrival, heavy smoke was visible on Side A. The crew pursued an offensive interior attack with a 1 3/4" line, entering the residence through the front door. The crew was met with heavy, dark smoke to floor level combined with high heat conditions. The firefighter involved entered the residence as part of the initial interior attack and within two minutes of entering the building, inhaled two (2) breaths of heated smoke and gas. The firefighter immediately exited the building and notified command. He was immediately evaluated by on-scene paramedics and transported to the hospital for evaluation and follow up care. The firefighter was cleared at the hospital with no long term residual consideration. Blood gases were normal for CO and other fire related gases.

### **Lessons Learned**

The command structure worked well during this incident. All personnel were aware of the event, resources responded appropriately and the injured firefighter received immediate care. This event underscores the need for a command system which offers a high degree of accountability and that the potential need for RIT is always there, even on seemingly simple events.

Following the incident, a full investigation was conducted on the chain of events. The firefighter indicated that he had followed SOGs by checking his equipment at the beginning of his shift and that all equipment was working properly. The Department also requires that

any SCBA failure result in a full assessment of the device. The device was immediately removed from service. Certified technicians evaluated the mask and unit. The unit was in proper working order and there was no indication/reason for failure to have occurred. It was determined that the firefighter had been improperly storing the face piece and that his seal was potentially impaired as a result of the storage practice. Prior annual fit testing had not indicated a problem with the seal. The firefighter was issued a new mask along with fit testing to confirm the seal. The problem was most likely caused by the firefighter not completely opening the valve on the bottle prior to entering the fire. All other causes were eliminated. All personnel received follow up direction of proper storage of face pieces and a reminder was sent out to all personnel reminding them to make sure bottle valves are fully open before entry into a hazardous environment.

**Report Number:** 06-521  
**Report Date:** 10/20/2006 1509

### **Demographics**

Department type: Paid Municipal  
Job or rank: Lieutenant  
Department shift: 24 hours on - 72 hours off  
Age: 34 - 42  
Years of fire service experience: 17 - 20  
Region: FEMA Region II  
Service Area: Urban

### **Event Information**

Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.  
Event date and time: 09/15/2006 2200  
Hours into the shift: 0 - 4  
Event participation: Told of event, but neither involved nor witnessed event  
Weather at time of event:  
Do you think this will happen again?  
What were the contributing factors?

- Individual Action
- SOP / SOG
- Protocol
- Decision Making

What do you believe is the loss potential?

### **Event Description**

An Engine Company was preparing to operate at an interior structural fire. One member of the unit removed the regulator from the facepiece to conserve air while waiting for water. Once the hoseline was charged, he reconnected the regulator but was unable to obtain an airflow from the SCBA. The member activated the regulator purge valve in order to receive an airflow and the continued to operate.

### **Lessons Learned**

The SCBA facepiece should be donned prior to entering the IDLH area. The inhalation of smoke or toxins can decrease the members lung function capacity inhibiting the members ability to exert enough force to release the regulator manual shutoff switch to start airflow.

The cylinder valve must be fully opened. Activation of the vibra alert is not an indication that the valve is fully open. The valve handle must be turned counter clockwise until it reaches the open stop position. If the cylinder is not fully opened, it will restrict airflow, possibly causing an extremely dangerous condition similar to mask shutdown.

Whenever a member is confronted with a situation where they have to operate using the purge valve, the member must notify the Officer and immediately leave the contaminated area, accompanied by another member.

**Exposure to 1.3% of carbon monoxide will cause unconsciousness in two or three breaths and will cause death in a few minutes. Exposure to small concentrations for only a few seconds inhibit's ones ability to think clearly, rapidly causes disorientation, and gives a feeling of euphoria compounding the risk hazard.**

**Report Number:** 07-784

**Report Date:** 03/09/2007 0829

### **Demographics**

Department type: Paid Municipal

Job or rank: Lieutenant

Department shift: 24 hours on - 24 hours off

Age: 34 - 42

Years of fire service experience: 17 - 20

Region: FEMA Region I

Service Area: Suburban

### **Event Information**

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

Event date and time: 03/04/2007 1900

Hours into the shift: 9 - 12

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
- Human Error
- Procedure
- Equipment

What do you believe is the loss potential?

- Life threatening injury
- Property damage

### **Event Description**

While conducting an in-station SCBA drill using the apparatus floor as a wide open search area, an event occurred involving a spare SCBA cylinder. During a break in the drill we noticed that one of the SCBA cylinders that was laying horizontally in a group, had rolled away from the other cylinders. I was wearing full protective gear during the drill and reached over with my foot to gently roll the cylinder back toward the others. As I moved the cylinder with my foot, the valve opened causing the cylinder to lurch forward. The cylinder hit the toe of my turnout boot causing it to become airborne. It went over my shoulder, contacted the back of the ambulance door leaving a severe dent and impression into the outer skin of the door about 6 feet off the ground. The cylinder then bounced over to the apparatus garage door and then into the center of the apparatus floor where it began to spin in a circle out of control. As it was spinning, it was relatively stationary in a fixed position and I was able to get a hold of the bottle and close the valve. The cylinder had sustained damage to the valve stem.

### **Lessons Learned**

SCBA cylinders are high pressure devices that are taken for granted and often treated lightly and routinely.

Cylinder valves should always be securely tightened by hand and not "lightly" shut off.

Cylinders should always be secured in racks or suitable holders even temporarily. Our department as well as many others routinely lay cylinders horizontal on the ground after fires. Caution should also be used when transporting spare cylinders in vehicles. The cylinders should be secured in the vehicle.

**Report Number:** 07-946  
**Report Date:** 06/08/2007 1116

### **Demographics**

Department type: Paid Municipal  
Job or rank: Captain  
Department shift: Other: 2/4.OXOXXOXOXXXX  
Age: 52 - 60  
Years of fire service experience: 24 - 26  
Region: FEMA Region IX  
Service Area: Urban

### **Event Information**

Event type: Fire emergency event: structure fire, vehicle fire, wildland fire, etc.  
Event date and time: 06/06/2007 2245  
Hours into the shift:  
Event participation: Involved in the event  
Weather at time of event:  
Do you think this will happen again?  
What were the contributing factors?

- Procedure
- Human Error
- Equipment
- Training Issue

What do you believe is the loss potential?

- Other

### **Event Description**

I was told about a failure of a breathing apparatus at a recent fire. The individual reported that while in the middle of fire attack and under heavy fire conditions, he took a breath and the system failed. He then removed his mask and took in "hot and smokey air". He proceeded to "bail out" of the area. He was hindered by many other firefighters in the narrow hallway. He felt that his life was in danger and he was very close to going down. The individual also stated that he had not opened the tank valve more than a "turn or two", as this was his "normal practice with no previous problems".

Be advised this isn't the first time that this type of event has occurred. This is the second time I know for sure and have heard of at least one other.

After the first event, my department had the SCBA manufacturer come out and investigate the SCBA failure. Their investigation concluded that because of the high pressure (4500psi) air system, the valve system had frozen because of a restricted opening. They advised that this type of problem would not happen again if the SCBA bottle valve was opened completely. The department did not have the SCBA from the previous incident evaluated by an outside source.

The individual involved has not advised our staff of the incident. I will speak with the individual to do so and if not I will advise that we have a training issue or a problem with our SCBA's

## **Lessons Learned**

[Reviewer provided: Failure to fully open the cylinder valve completely is a recipe for disaster. The National Fire Fighter Near-Miss Reporting System has received several near miss reports dealing with "SCBA failure due to restricted airflow" and the high pressure valve has only been opened "one or two turns as a regular practice." After discussion with several manufacturers, all have advised that this is a dangerous and ill advised practice.

Fully open the cylinder valve any time SCBA is used.]

**Report Number:** 07-1009

**Report Date:** 08/02/2007 1620

### **Demographics**

Department type: Paid Municipal

Job or rank: Fire Fighter

Department shift: 48 hours on - 96 hours off

Age: 34 - 42

Years of fire service experience: 7 - 10

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: 07/03/2007 1924

Hours into the shift:

Event participation: Told to and submitted by safety officer

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**

I was the acting Lieutenant and my engine company was dispatched to a first alarm assignment for a confirmed structure fire. Upon arrival we encountered smoke showing for side A/B corner of structure and assumed a fast attack mode. While forcing the front door, smoke was visible on the first floor and in the basement windows. This indicated a possible basement fire. My partner and I advanced a 1 ¾" hoseline through the first floor kitchen area and down the stairs. At the bottom of the stairs we experienced a high heat and heavy smoke environment. We visualized the "glow" from the seat of fire approximately ten feet around a corner. After making multiple attempts to advance the hoseline, I called upstairs for more hose and instructed my partner to hit the fire from our location in order to cool the room. As I did this, I experience a brief (less than one second) activation of the vibralert on my SCBA followed by my mask "sucking" to my face. I activated my purge valve and got a small release of air followed by the mask sucking to my face again. Using my helmet mounted flash light I confirmed my SCBA pack gauge was reading 0 psi. I grabbed the coat of my partner and relayed "no air, let's go". I then started up the stairs. After reaching the top of the stairs I turned and could not see him following me. I scanned the kitchen and caught the reflection of bunkers a few feet from me. I was unable to speak so I moved to the side of the basement doorway, crouched low to the floor and cracked my regulator in order to take in enough air to speak. I approached the officer from the rescue crew and relayed that I was out of air and my partner was in the basement alone. Once again my mask "sucked" to my face. I proceeded out the back door and removed my mask. I relayed that my partner was in the basement and the rescue crew was on their way to assist. I checked my pack and found my bottle stated I had approximately 2500 psi. My SCBA pack gauge showed 0 psi. I checked the bottle valve and found that it was closed. My partner later informed me that he heard me say "let's go" but did not hear me say I had "no air". He thought "let's go" meant advance the hose. As a result he did not realize I had left the basement. I believe that while

pulling hose around several corners and down the stairs, the hose was dragged over my bottle valve and shut off the valve.

### **Lessons Learned**

Ensure the bottle is fully open prior to entering building. I know that I made multiple turns on my bottle valve and believed that the bottle was fully open. However, I cannot say 100% that the bottle was fully open.

Check the bottle valve. Turning the bottle back on would have solved the problem and I would not have had to exit the building.

Utilize the EBSS. This would have allowed me to exit the building with air and bring my partner with me at the same time.

Make note of means of egress as the hose is advanced. I knew that after reaching the top of the stairs, I had to make a left turn and the back door would be approximately ten feet away.

**Report Number:** 07-1086  
**Report Date:** 10/06/2007 1943

### **Demographics**

Department type: Combination, Mostly 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: Suburban

### **Event Information**

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

Event date and time: 09/25/2007 2100

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?

- Human Error
- Individual Action
- Command

What do you believe is the loss potential?

- Lost time injury
- Minor injury
- Life threatening injury

### **Event Description**

My department was training at our county training facility when the event occurred. We were running three drills that day simulating live fire events. I'm relatively new to the fire service and really new to being an officer. For the last drill of the day we were going to simulate my apparatus being first in on a structure fire. Needless to say I was a little nervous. We arrived on scene and I told my two firefighters to pull a line and meet me by the front door as I did my "walk around". I radioed to the other responding units what the situation was and then proceeded to walk around the structure. There was fire on the first floor so I transferred command to the next in unit so that my crew and I could make entry. As I was continuing to don my equipment and focus on making sure that I did all the command functions properly, I didn't realize that I didn't open my SCBA bottle completely. My crew made entry, searched and put out a small class A fire in the first room. We then searched the second room we came to. I was third on the hose acting as a "slack man". I radioed to command that we were advancing to division two. My crew advanced up the stairs and I stayed at the bottom feeding them hose. The hose pushed me against the wall where there was a hand rail fairly hard. All of a sudden, my low air alarm started going off but I knew that I had a full bottle of air when I entered. Since we had been in the structure for only three or four minutes, I knew something was wrong. My next breath sucked my mask to my face. I needed to get out so I radioed "firefighter down, firefighter down" and grabbed the trainer

(a trainer was overseeing the operation inside the structure). I put my thumb under my SCBA mask and lifted trying to get a breath but the air was too hot and still pretty smoky. I pulled my hood up and took breaths from inside my coat and told the trainer that I was out of air. We rapidly exited and one of my chiefs came over to see what was wrong. He looked at my SCBA valve and noted that it was about a quarter turn from being completely turned off. We turned it on and I suited back up. I returned to help my crew.

**Lessons Learned**

I learned that even when in command you are no good to your department if you don't take care of yourself first.

**Report Number:** 08-257  
**Report Date:** 05/21/2008 1122

### **Demographics**

Department type: Paid Municipal  
Job or rank: Captain  
Department shift: 24 hours on - 72 hours off  
Age: 34 - 42  
Years of fire service experience: 11 - 13  
Region: FEMA Region II  
Service Area: Urban

### **Event Information**

Event type: On-duty activities: apparatus and station maintenance, meetings, tours, etc.  
Event date and time: 05/16/1994 1100  
Hours into the shift: 0 - 4  
Event participation: Involved in the event  
Weather at time of event: Not reported  
Do you think this will happen again?  
What were the contributing factors?

- Horseplay

What do you believe is the loss potential?

- Property damage

### **Event Description**

Eight (8) firefighters were on the apparatus floor and I snuck up on one of them from behind with a spare SCBA bottle. I opened the valve aiming the blast of air towards his behind. He jumped and accidentally knocked the cylinder from my hands. The bottle hit the floor and the valve opened up further causing the bottle to start spinning on the floor. It slowly started to rise off the floor and then rose faster and faster striking the ceiling (12 feet in height). This caused a chunk of concrete to fall. All eight firefighters scattered as the bottle started to rise as it almost looked like a cruise missile. When all the air was expended, the cylinder fell 12 feet after striking some lighting over the cascade system and destroying it. The cylinder then struck the cascade machine itself. The SCBA bottle was also damaged and put out of service.

### **Lessons Learned**

Even the most innocent horseplay can have significant ramifications. Joking around in a fire station and/or the fireground should be discouraged. There are enough hazards in the fire service without adding to those dangers. It would be terrible if someone had been struck by the SCBA bottle as it fell from 12 feet in the air.

**Report Number:** 08-516

**Report Date:** 10/16/2008 1318

### **Demographics**

Department type: Paid Municipal

Job or rank: Fire Fighter

Department shift: 24 hours on - 24 hours off

Age: 25 - 33

Years of fire service experience: 0 - 3

Region: FEMA Region IX

Service Area: Urban

### **Event Information**

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

Event date and time: 09/28/2008 0900

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?

- Individual Action
- Equipment
- Training Issue

What do you believe is the loss potential?

- Life threatening injury

### **Event Description**

This situation happened at a confidence course set up by our training division. The location of the course was an abandoned commercial structure. The event was training on low profile and zero profile crawling through breached walls while having our face masks blacked out.

While going through an area of the course, this person had to take the SCBA completely off his back and push it in front of him with no room to move his arms to either side. He continued to push the SCBA out of the crawl space and was moving quickly when his regulator shut down. He found that while he was pushing the SCBA in front of him the control valve to the SCBA was turning closed. He said he was not sure if he had fully opened the valve when he started, but at any rate it shut due to pushing on the ground upside down. He began to panic because he could not reach the valve to open it up. He could not reach his mask to take it off. He said he almost blacked out, but in a last ditch effort was able to shove his head up over the SCBA. He could barely reach the valve but had enough finger strength to turn it back on.

### **Lessons Learned**

Always make sure to turn on SCBA valves completely and to the point that they are snug. The department needs to change out old bottles with newer ones that have the push in lock mechanism so this does not occur again.

**Report Number:** 08-605  
**Report Date:** 11/20/2008 0145

### **Demographics**

Department type: Combination, Mostly paid  
Job or rank: Fire Fighter  
Department shift: Other: 3 on, 2 off 3 on 4 off  
Age: 25 - 33  
Years of fire service experience: 7 - 10  
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: 10/11/2008 1945  
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?

- Equipment

What do you believe is the loss potential?

- Life threatening injury
- Lost time injury

### **Event Description**

Our department, which is made up of a combination of volunteer and career personnel, received a call for a working structure fire. Our first due response was two engines, one ladder, one chiefs car and a medic. Upon arrival, we found that the fire was in the basement of a 2 1/2 story single family house. The occupants were both out and safe. They informed us of the fire location and that a door on the "D" side of the house was unlocked. This door opened onto a landing between the 1st floor and the basement. A 1 1/2" hose line was flaked out to the door and entry was made. The fire was rolling from the basement ceiling up around the corner and into the first floor. After quickly applying water to the fire on the first floor, an attack on the basement was initiated. Heavy fire conditions prevented a quick push down the stairs. The fire had seemed to be knocked back enough that a push could be made for the basement. The nozzleman confirmed with the officer that he was going to make a push for the basement. The officer confirmed that it was a go and the push was made. About three steps down, the control man feeding the line in the door behind the attacking team failed to continue a steady feed. The line may have become stuck or it may have been bad timing but progress was stopped. At this time, the nozzleman made a counter clock wise tug with his upper body to try and get the line free. As he did this, the fire stream that was pushing the flames back was turned into the wall. Just before this, the truck company had started venting the basement windows. This caused a rush of air into the basement and a quick flare up of the fire. The nozzleman was engulfed in the flare up for a few moments when the officer grabbed hold of his SCBA and pulled him up the stairs to safety. When doing this, the nozzleman's air cylinder valve was shut off by rubbing against the wall. He lost his flow of air to the mask and was unable to breath. Due to wet gloves, he was unable to

release the regulator and unable to communicate to fellow firefighters. He had to hit one of the volunteers to get his attention. The volunteer removed the regulator and the nozzleman regained himself and was able to turn the SCBA on. After a quick inspection, he got back in and finished extinguishing the fire.

### **Lessons Learned**

- 1) While feeding the hose to an inside crew, keep the line moving freely and free of snags. Keep line from getting under car tires in drive ways.
- 2) Inspect your SCBA at the beginning of every shift. Make sure all bottles are full. Check to make sure the regulator release click moved freely and is easy to activate.
- 3) Train to remain calm in an emergency. The more often you train, the more comfortable you will be.
- 4) Do not stop on stairs when making a push for a lower floor.