

ELSEVIER

# ANNUAL REPORT 2007



An exclusive supplement to *FireRescue* magazine

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**FIRE**RESCUE



National Fire Fighter Near-Miss Reporting System  
[www.firefighternearmiss.com](http://www.firefighternearmiss.com)

# 2007 NEAR-MISS ANNUAL REPORT

## Recording Our Past Challenges to Preserve Our Future Successes

### Dear Colleagues:

We are pleased to have been asked to write this letter to you to co-introduce the second-annual report from the National Fire Fighter Near-Miss Reporting System. The report could not have been formed without the near-miss reports submitted by you and your fellow firefighters. The value of near-miss reporting has been proven in many industries, and now this important innovation plays an integral role in improving firefighter safety.

One of the most illuminating statistics in this report is the fact that 90 percent of report submitters stated that their primary motivation to submit a report was to help another firefighter. Thank you to each of you who took the time to submit a report to [www.firefighternearmiss.com](http://www.firefighternearmiss.com) in 2007. You will likely never meet the firefighters who benefit from reading your report, but we are certain there are firefighters who will continue to learn from the report you submitted. To those of you who haven't submitted a report yet, we strongly encourage you to take 15 minutes out of your day to make a difference in another firefighter's safety.

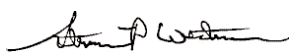
The job of a firefighter will always be among the most noble and visible in our communities. That visibility is steeped in the risks firefighters take to protect and save lives and property. However, we believe that too many of our peers have lost their lives or suffered serious injury for causes that didn't add up to the risk assumed. Our brothers and sisters arrived at those decision points fueled by a desire to serve, protected by state-of-the-art equipment, with every intention of returning home. Too often the reason they didn't return home or suffered injury was not due to a failure of technology, but a failure of the human "technology" to recognize dangerous conditions.

Through reports analyzed by your peers, this year's Annual Report from [www.firefighternearmiss.com](http://www.firefighternearmiss.com) shows us that quite often we are responsible for the situations we get ourselves into. The conclusions reached by this year's report should not make us shrug our shoulders and say, "So? What's new?" They should make us want to redouble our efforts to find and implement new strategies to improve situational awareness, communication, knowledge and skills. A new safety-based culture will still allow firefighters to fight fires and take risks, but we will be armed with better tools based on these strategies.

As you look through this report, take a moment to reflect on what you have in your hands. This second-annual report is significant because it heralds a continuation of a program built by firefighters for the benefit of firefighters. It is also significant because it says you—the firefighters who visited the Web site, firefighters who submitted reports, firefighters who regularly use the Report of the Week function and firefighters who participated in the analysis working groups—recognize the need to ensure we all get home after every alarm.

Stay safe, and let us know what you think of this new era in firefighter safety. Send your comments to us at [info@firefighternearmiss.com](mailto:info@firefighternearmiss.com).

Fraternally,



Chief Steven P. Westermann, CFO  
President, International Association of Fire Chiefs




Dennis Smith  
Chair, National Fire Fighter Near-Miss Reporting System Task Force



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**FIRE RESCUE**

Art Director: Erica Krystek

# PROGRAM AT A GLANCE

## Who can submit a report?

Anyone in the fire and emergency services can and should submit a near-miss report. The term “firefighter” in the title of the program includes anyone in the fire and emergency services. Regardless of whether you’re a captain in a metropolitan department, a hazmat technician in a combination department or a volunteer paramedic in a rural area, you have experienced something that can help another firefighter. Members of a crew who experience a near miss collectively should each file a near-miss report because each individual experiences an event differently.

## What is the near-miss reporting system?

The National Fire Fighter Near-Miss Reporting System is a free, voluntary, confidential, non-punitive and secure tool that you can use to learn from other firefighters and to share your experiences with other firefighters. The firefighter near-miss program is based on the 31-year-old Aviation Safety Reporting System (ASRS). The ASRS uses the information it gathers to address reported hazards, conduct research on operational safety problems and facilitate an understanding of aviation safety-related issues and human performance.

Using the ASRS as its model, the National Fire Fighter Near-Miss Reporting System identifies patterns from near-miss reports to help develop strategies for reducing firefighter injuries and fatalities. The aviation, military, petroleum, nuclear power and medical industries credit the use of near-miss reporting systems with significantly contributing to reducing errors, injuries and fatalities.

## Where can you submit a report?

Reports can be securely submitted electronically at [www.firefighternearmiss.com](http://www.firefighternearmiss.com). Paper reporting forms can be downloaded from the Web site and either mailed or faxed. You may also request paper reporting forms by calling 703/537-4848 or e-mailing [info@firefighternearmiss.com](mailto:info@firefighternearmiss.com).

## When should you submit a report?

Reports should be submitted on a variety of “when” cues. The most obvious “when” is as soon as you realize you experienced a near miss; the experience will be fresh in your mind. A second “when” is after you have read a near-miss report and are reminded of a similar circumstance you have experienced. The third “when” includes hearing another firefighter—who is reluctant to file the report—describe a near-miss event. Finally, you can submit reports to document near misses from your past.

## Why should you submit a report?

1. To improve the knowledge, skills and abilities of other firefighters as they learn from your real-life experiences;
2. To help formulate strategies to reduce firefighter injuries and fatalities; and
3. To enhance the safety culture of the fire service.

## How does the program work?

Visitors to [www.firefighternearmiss.com](http://www.firefighternearmiss.com) may submit reports, search reports or access safety-related information. The anonymous and confidential online reporting form takes approximately 10–15 minutes to complete. There is no statute of limitations for submitting a report. There are 16 questions and two open text boxes to describe the event and the lessons learned.

Once the report has been submitted, report reviewers (active-duty fire service professionals) analyze the report and de-identify

the report by removing information such as department names, company numbers and individuals’ names.

Report reviewers also collect additional information from reporters, when contact information is provided. For more information on the program and its history, visit [www.firefighternearmiss.com](http://www.firefighternearmiss.com).



PHOTO FLOWER MOUND (TEXAS) FIRE AND EMERGENCY SERVICES DEPARTMENT

## Acknowledgments

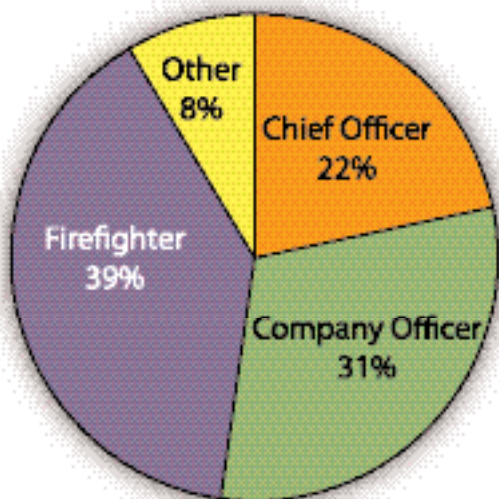
Thank you to the U.S. Department of Homeland Security’s Assistance to Firefighters Grant Program for fully funding the National Fire Fighter Near-Miss Reporting System. Thank you also to Fireman’s Fund Insurance Company for providing funds for the creation of the program. The International Association of Fire Chiefs administers the program in consultation with the National Fire Fighter Near-Miss Reporting System Task Force, deftly led by Dennis Smith. The task force continues to serve with the unifying goal of contributing to firefighter safety. The program would not be successful without its partnership with the International Association of Fire Fighters, particularly Patrick Morrison. Chief Billy Goldfeder and Gordon Graham, founders of [www.FirefighterCloseCalls.com](http://www.FirefighterCloseCalls.com), provide enthusiastic support and guidance to program staff. Thank you to our program partners, including the National Fallen Fire Fighters Foundation, Fire Department Safety Officers Association, the International Society of Fire Service Instructors and many other local, state and national associations. To the report reviewers who analyze and de-identify every report submitted, thank you for your incredible professionalism and your service to your fellow firefighters. And most importantly, thank you to each of you who submitted a report in 2007.

# REPORTER DATA

*Note: The statistics in the 2007 Annual Report are from reports received Jan. 1–Dec. 31, 2007. 477 reports were received in 2007 for a total of 1,559 reports posted to the Web site.*

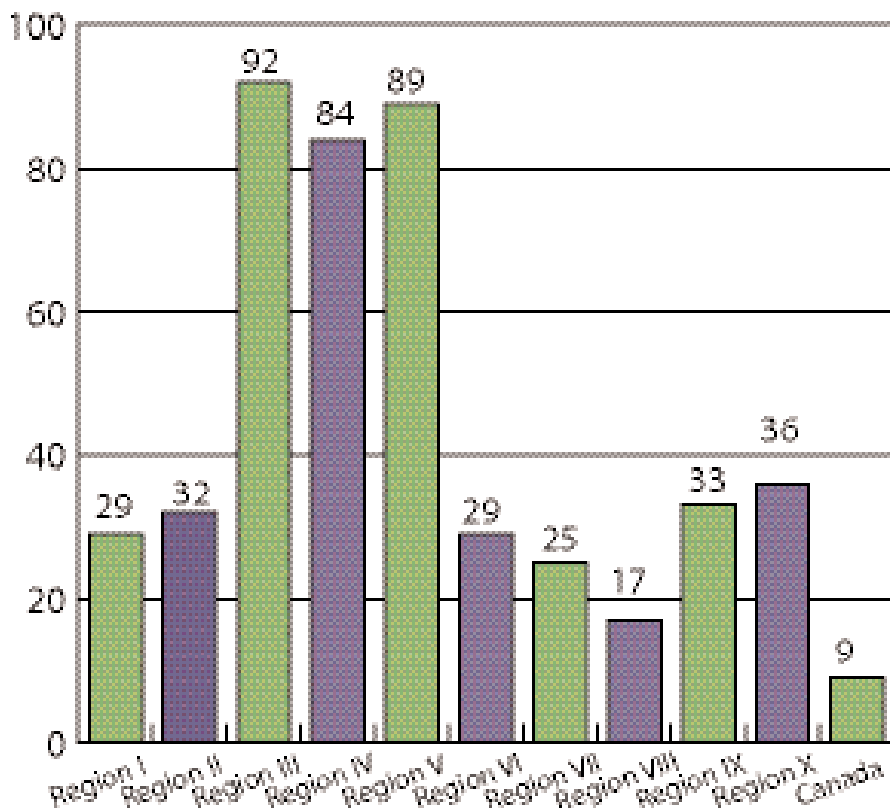
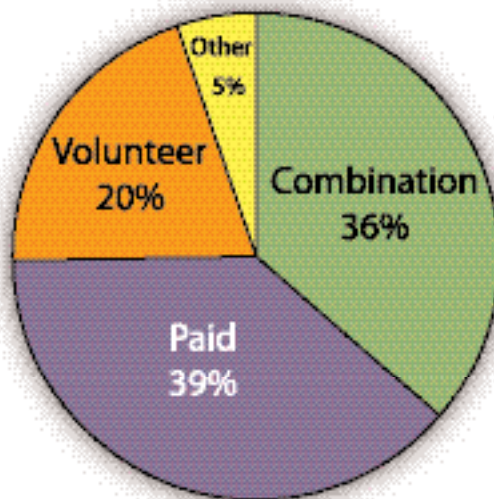
## Job/Rank

Reporters select their job/rank. If the job/rank doesn't appear, they can select "Other" and enter a description.



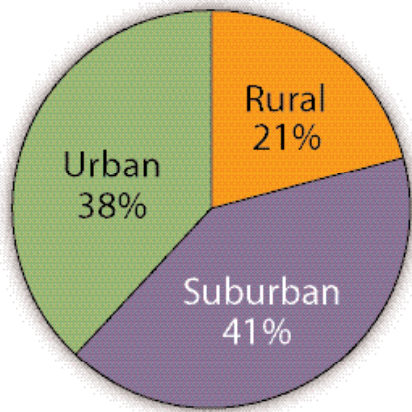
## Department Type

Reporters select the type that best describes their department. If the department doesn't fit any of the descriptions, they can select "Other" and enter a description.



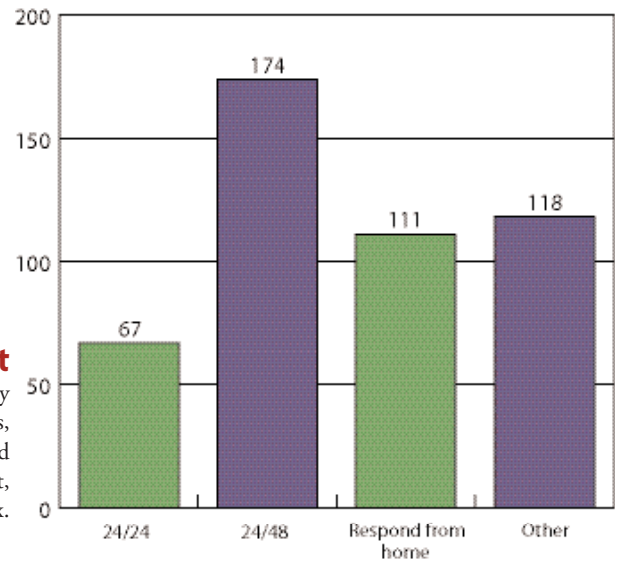
## FEMA Region

Reporters select their state when submitting a report. The FEMA region is automatically generated to protect the identity of the reporter and department. Only the FEMA region is posted on the Web site. In 2007, reports were received from the 50 U.S. states and four Canadian provinces.



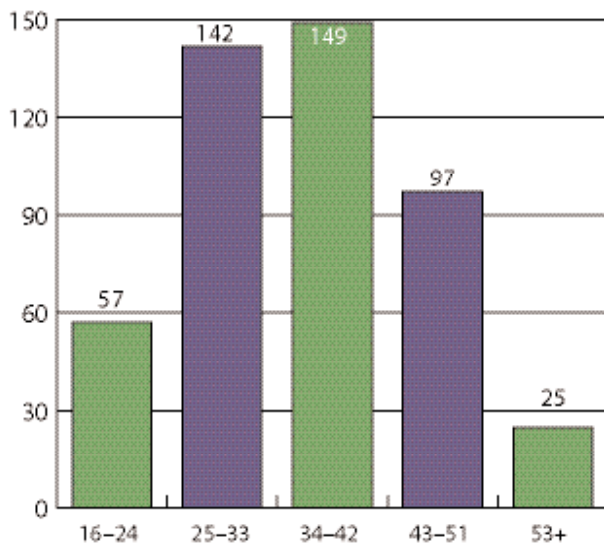
### Service Area

Reporters self-declare the type of area their fire department serves.



### Department Shift

Reporters select the work shift in their department. This category applies to career departments (hours on/hours off, days/nights, straight days) and volunteer departments (stand-by, duty night and respond from home). If a reporter cannot find the appropriate shift, they can select "Other" and provide more detail in the text box.



### Age at Time of Event

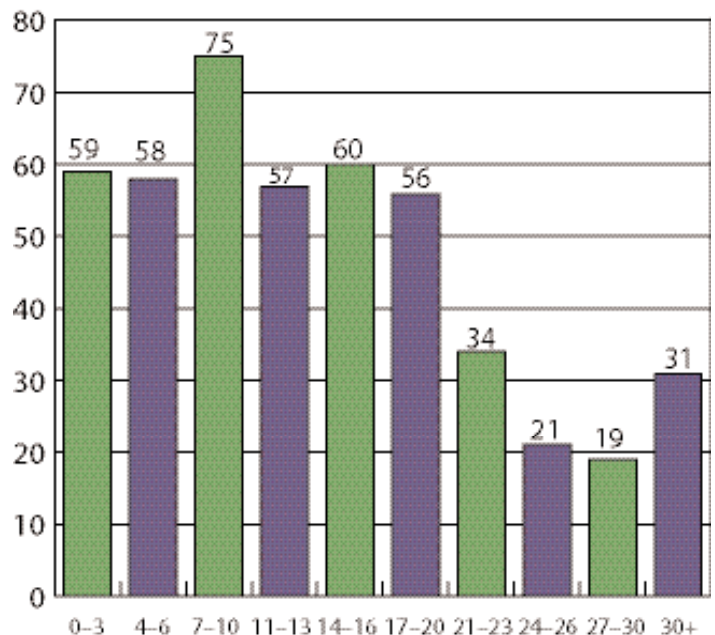
Reporters select their age range.

### CREW RESOURCE MANAGEMENT

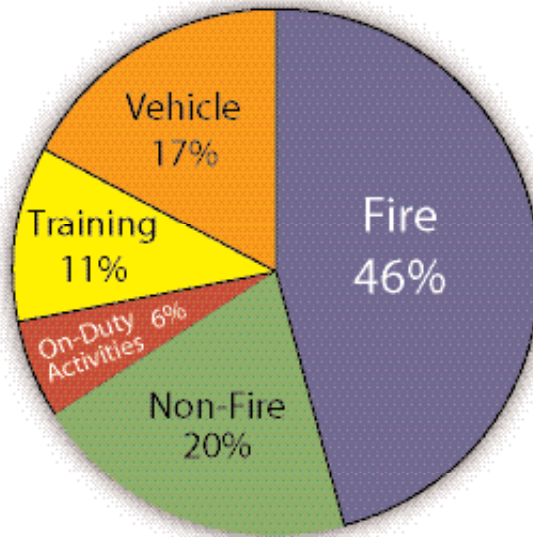
Crew Resource Management (CRM) is the practice of effectively using all resources to reduce the adverse effects of error. There are five principles of CRM: communication, situational awareness, decision making, teamwork and task allocation. Debrief is often listed as the sixth principle of CRM. Training in CRM creates a better performing crew and more informed leader. For more information on CRM, download the Crew Resource Management guidebook from the Resources page of [www.firefighternearmiss.com](http://www.firefighternearmiss.com).

### Experience at Time of Event

Reporters select their fire service years of experience. The experience levels are based on the traditional career cycle of a firefighter.



# EVENT DATA

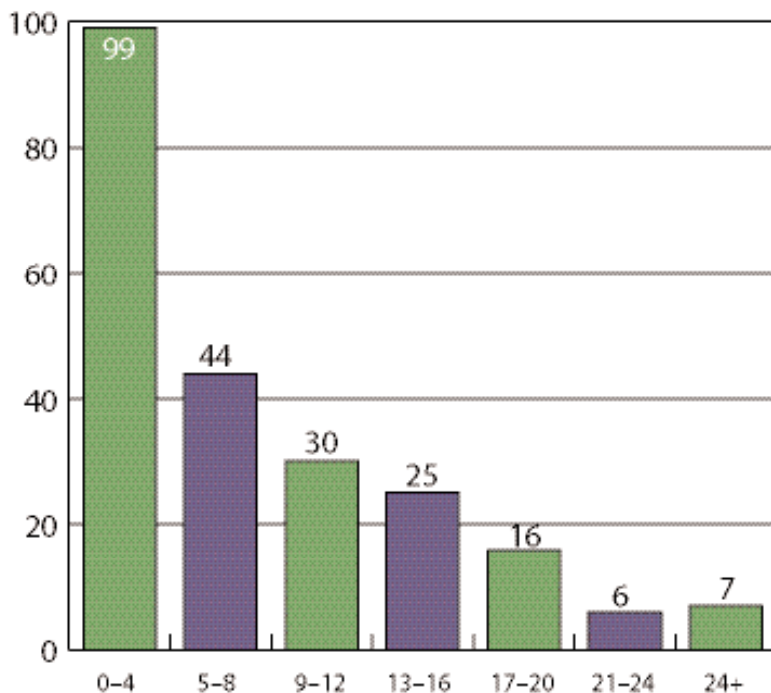


## Event Type

Reporters select from five categories plus an "Other" choice. The categories mirror the five main categories where statistics indicate firefighters suffer injuries and fatalities.

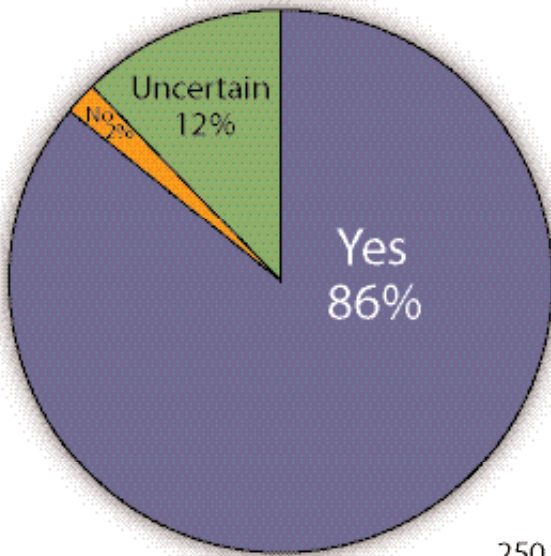
## Event Participation

Reporters identify their level of involvement in the event. This question was requested by program users so readers would have an idea of the perspective of the reporter. The Safety Officer category was added in April 2007.



## Hours into Shift

This data reflects the number of hours into a shift prior to the event occurring. The Volunteer category was added in April 2007. Prior to this addition, many volunteers selected 0-4 hours into shift.

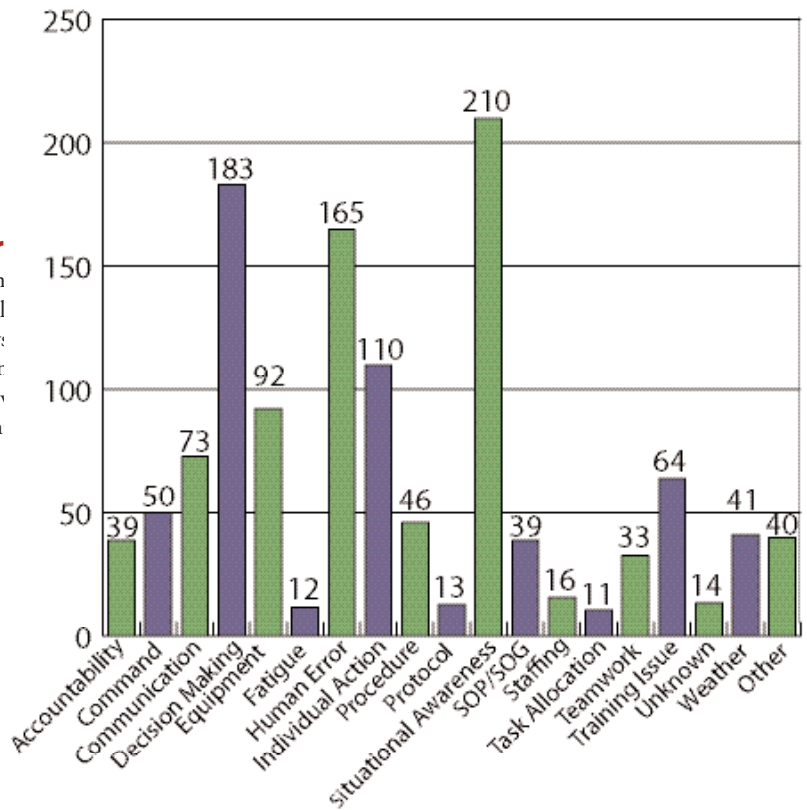


### Could This Happen Again?

This question provides reporters an opportunity to state whether the near miss was an isolated incident or could possibly reoccur. Reoccurrence could be an indicator of a need for a systemic change in a procedure, technology or culture.

### Contributing Factor

Reporters can select up to five of 20 contributing factors. The factors are based on frequent encountered terms in standard injury reporting systems and human factors. The most common contributing factors mirror components of Crew Resource Management.

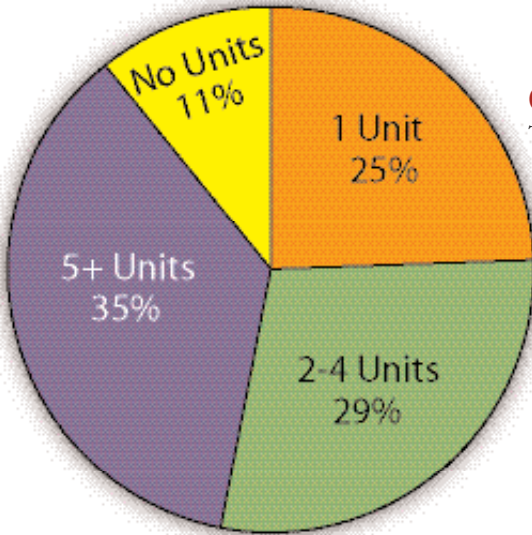


### Loss Potential

Reporters can select up to five of seven critical loss items. The possibility of death or serious injury was recorded in the majority of near-miss reports. Report reviewers stated that reporters frequently cited the life-threatening potential as a compelling reason for filing a report.

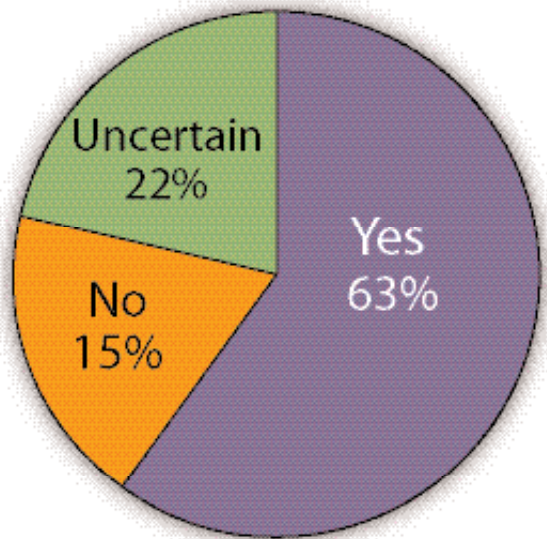
# CALLBACK DATA

Near-miss reports can be submitted without contact information. However, about 90 percent of the reports submitted in 2007 did include contact information. Providing contact information allows the report reviewers to either call or e-mail the reporter for follow-up questions and additional details. This process is referred to as the callback. The statistics on these pages were collected by the report reviewers during the callbacks. Contact information is not shared with anyone and is destroyed along with the original report when the report is posted on [www.firefighternearmiss.com](http://www.firefighternearmiss.com).



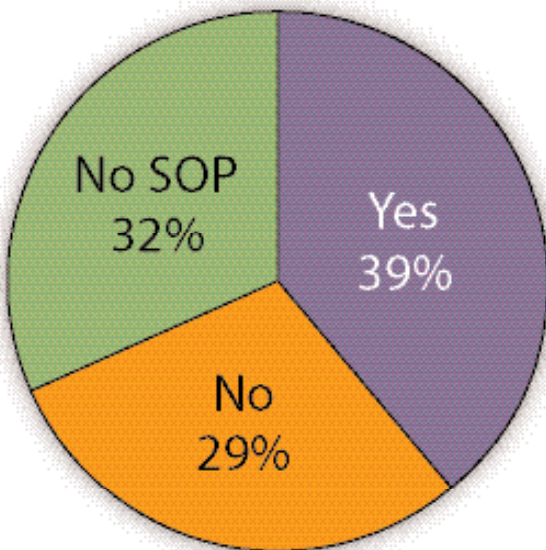
## Command & Control at Fire Emergency Events

This field refers to the number of units operating at an emergency event.



## Was ICS in Use?

If the narrative is not clear on whether an incident command system (ICS) was in place, the reviewer will ask the question during the callback. This field was added in April 2007.

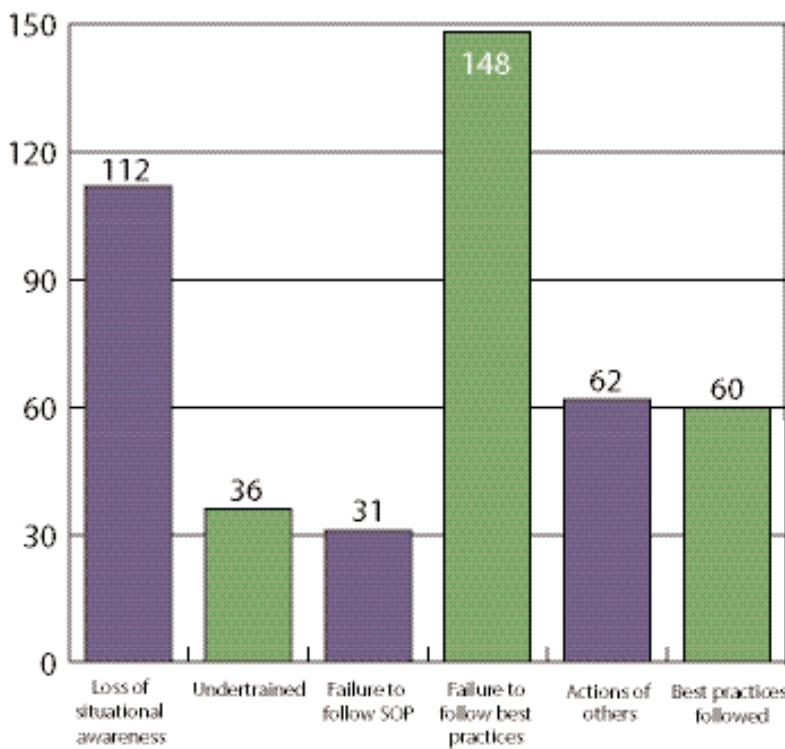
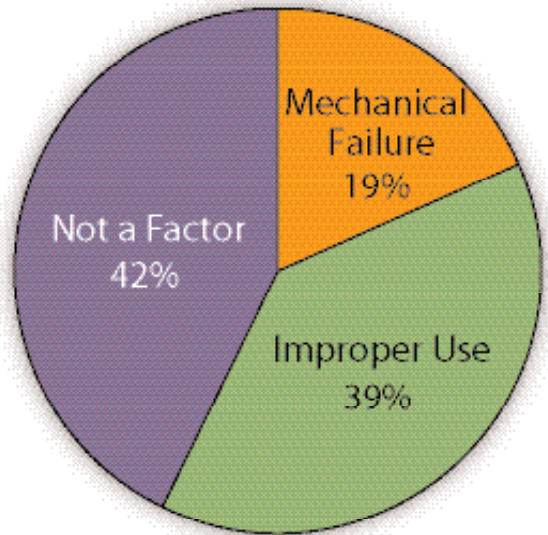


## Were SOPs/SOGs in place?

Readers frequently ask about SOPs or SOGs. They want to know two things: Was an SOP or SOG in place and being followed at the time of the near miss and, if not, did the lack of an SOP contribute to the near miss? This category includes an analysis by the reviewers of whether best practices were employed.

### Equipment

Reviewers determine, either through the report narrative or callback, if equipment was a factor in the near miss.



### Performance

Conclusions are drawn as to whether the near miss occurred due to varying degree of human error or violations. An “Actions of others” category exists for the reviewers to use if the near miss occurs when best practices were in place and followed (e.g., a fire department vehicle is struck by a car while the fire department vehicle is properly placed on a roadway to protect emergency workers).

### Root Cause of Event

The Human Factors Analysis and Classification System has been adopted by the Firefighter Near-Miss Reporting System as its primary tool for evaluating near-miss reports (see p. 10–11 for more information). The root cause question was added in April 2007.

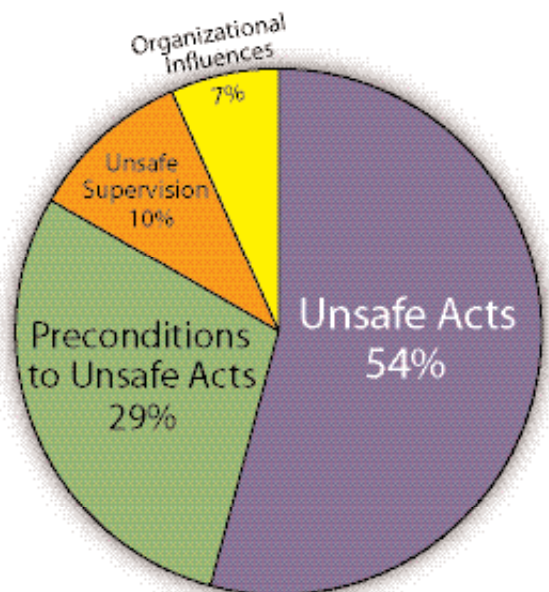




PHOTO: LOUISVILLE (KY) FIRE DEPARTMENT

## Working Groups

In August 2007, a working group of firefighters and officers convened to analyze reports using a tool modified from the U.S. Navy’s Human Factors Analysis and Classification System (HFACS). HFACS was also used for the analysis found in the 2006 Near-Miss Annual Report in the February 2007 issue of *FireRescue*. This year’s working groups analyzed reports in the following categories: maydays, personal protective equipment (PPE), vehicle blocking, truss construction and flashovers.

Facilitators and working group participants were trained on HFACS prior to beginning their analysis. The working group participants were from a cross-section of fire and emergency services. The groups included some participants from the 2006 analysis working groups, providing an experience base that enhanced this year’s exercise. Eastern Kentucky University students assisted the facilitators.

The working groups applied HFACS and their own experience to the near-miss reports. The following pages illustrate five different approaches to analyzing near-miss reports using HFACS. These different approaches can be used in recruit schools, company officer and

REPORT TOPIC	ANALYSIS APPROACH	BENEFIT	ESTIMATED TIME
<i>Maydays</i>	Case study	Introduction to near-miss reporting	10–15 minutes
<i>PPE</i>	Grouped reports	Pattern identification	20–30 minutes
<i>Vehicle Blocking</i>	HFACS case study	Introduction to HFACS	30–45 minutes
<i>Truss Construction</i>	HFACS on grouped reports	HFACS exercise	45–60 minutes
<i>Flashovers</i>	HFACS on grouped reports (advanced)	Individual and organizational assessment	More than 1 hour

chief officer training, company training sessions and conference sessions, to conduct your own deeper analysis of the reports. Visit the Resource Page at [www.firefighternearmiss.com](http://www.firefighternearmiss.com) to download all materials used in this year's exercise.

The analysis is not intended to assign fault. Instead, the analysis looks at the human factors related to the near-miss event, and how the event might have been avoided. The working groups praised reporters for submitting reports from which firefighters can learn. Readers of this report are urged to submit their incidents to [www.firefighternearmiss.com](http://www.firefighternearmiss.com).

## 2008 WORKING GROUP

Want to be a part of the 2008 Near-Miss/HFACS working groups? Contact [info@firefighternearmiss.com](mailto:info@firefighternearmiss.com) for information on the 2-day pre-conference session at Fire-Rescue International in Denver, Colo., Aug. 12–13.

## Human Factors Analysis & Classification System

HFACS helps us to identify critical factors and safety concerns in reports that have been submitted to the National Fire Fighter Near-Miss Reporting System. This second-annual report takes us a step closer to realizing this important goal.

The core components of the U.S. Navy's HFACS have been preserved. Modifications were made to adapt the analysis tool to the fire service. Four levels of individual and institutional performance are analyzed:

- Unsafe acts;
- Preconditions to unsafe acts;
- Unsafe supervision; and
- Organizational influences.

Within each of these levels are categories that define and classify the root causes of the near-miss event. HFACS looks at the near-miss event as the end result of the chain of actions or omissions that lead up to the event. We can begin to identify practices to prevent near misses and, ultimately, injuries and fatalities, by beginning to assess these different elements. Additional information about HFACS is available at [www.nifc.gov/safety/reports/humanfactors\\_class&anly.pdf](http://www.nifc.gov/safety/reports/humanfactors_class&anly.pdf).

### HFACS Level 1: Unsafe Acts

The Unsafe Acts level contains two categories: errors and violations. Many near-miss reports contain several unsafe acts that could be analyzed; however, the working groups were asked to focus on only one unsafe act during their analysis.

Making a distinction between errors and violations is critical to effective error management, injury reduction and life safety. Specifically, errors are unintentional acts classified as being decision-based, skill-based or perception-based. Decision-based errors include flaws in communicating information to decision makers. Skill-based errors include attention failure (lack of situational awareness), memory failure (forgotten or missed step in a procedure) or technique failure (lack of training). Perception-based errors include underestimating or misinterpreting critical incident factors (e.g., fire spread, traffic speed, risk vs. reward). Perceptual errors may also include visual illusions.

Violations are intentional acts classified as routine or exceptional. Routine violations include failure to use safety equipment, failure to follow recommended tactile best practices (e.g., sounding the floor before entering) or failure to follow recommended cerebral best practices (e.g., conducting a risk/benefit analysis). Exceptional violations include not being qualified to perform an action.

### HFACS Level 2: Preconditions to Unsafe Acts

This level analyzes substandard conditions and practices of the individuals involved. Substandard conditions include factors contributing to adverse mental states, psychological states and physical limitations. Substandard practices include failure to use elements of crew resource management and personal readiness.

SUBSTANDARD CONDITIONS			SUBSTANDARD PRACTICES	
Mental State	Psychological State	Physical Limitations	Crew Resource Management	Personal Readiness
<ul style="list-style-type: none"> <li>• Complacency</li> <li>• Distraction</li> <li>• Get-home-itis</li> </ul>	<ul style="list-style-type: none"> <li>• Physical fatigue</li> <li>• Mental illness</li> <li>• Mentally ill-prepared for assignment</li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient reaction time</li> <li>• Insufficient intelligence</li> <li>• Incomplete physical capability</li> </ul>	<ul style="list-style-type: none"> <li>• Failure to communicate</li> <li>• Failure to recognize task limitations</li> <li>• Failure to use all available resources</li> </ul>	<ul style="list-style-type: none"> <li>• Inadequate rest</li> <li>• Failure to inform supervisor of illness</li> <li>• Overexertion before duty</li> </ul>

## HFACS Level 3: Unsafe Supervision

Unsafe supervision is broken down into four categories: inadequate supervision, allowing inappropriate operations, failure to correct known problems and supervisory violations. This level is intended to examine the role (if any) of supervision in a near-miss event.

INADEQUATE SUPERVISION	ALLOWING INAPPROPRIATE OPERATIONS	FAILURE TO CORRECT KNOWN PROBLEMS	SUPERVISORY VIOLATIONS
<ul style="list-style-type: none"> <li>• Guidance not provided</li> <li>• Training not provided</li> <li>• Qualifications not tracked</li> </ul>	<ul style="list-style-type: none"> <li>• Personnel not adequately briefed</li> <li>• Understaffed</li> <li>• Unnecessary hazards permitted</li> </ul>	<ul style="list-style-type: none"> <li>• Unidentified and unqualified</li> <li>• Failure to provide training to unqualified personnel</li> <li>• Failure to correct inappropriate or unsafe behaviors</li> </ul>	<ul style="list-style-type: none"> <li>• Authorization of unnecessary hazards</li> <li>• Failure to enforce department rules</li> <li>• Authorization of unqualified personnel to perform tasks</li> </ul>

## HFACS Level 4: Organizational Influences

Organizational influences are the most difficult to analyze in a near-miss report because the report is often focused on the end result—the near-miss event itself. The operating culture of the fire department is often as significant to the near miss as the individual’s actions. For example, if a department does not demand good risk-vs.-reward evaluation by its members, the members will tend to aggressively take risks that expose them unnecessarily to harm. This level of HFACS examines resource management (staffing, training, budget resources and equipment/facility resources) and organizational climate (chain of command, delegation of authority, risk management programs and safety programs).



PHOTO BOONE COUNTY (MO.) FIRE PROTECTION DISTRICT

# REVIEWED REPORTS

## Mayday Reports

- ✓ Crew without a mayday procedure forced to retreat into vacant apartment due to worsening fire conditions (No. 05-197).
- ✓ When roof collapses, firefighter is injured and rescued by another firefighter (No. 05-567).
- ✓ Mayday declared in a commercial fire; another firefighter falls during the search when a stairway collapses (No. 06-346).
- ✓ Firefighter transmits a mayday message when trapped in a refuge area (No. 06-501).
- ✓ Loss of situational awareness causes firefighter to fall through floor at a structure fire (No. 07-647).
- ✓ Rapid fire growth traps firefighter without an available rapid-intervention team (RIT) (No. 05-589).
- ✓ Arson fire creates mayday situation for firefighters (No. 05-654).
- ✓ Five firefighters trapped on second floor during transition to defensive operations (No. 06-177).

## PPE Reports

- ✓ Firefighter cuts wrist while wearing regular leather work gloves (No. 05-535).
- ✓ Incident commander and safety officer enter a possible WMD incident hot zone without PPE (No. 05-366).
- ✓ Company officer on back-up line doesn't wear proper PPE (No. 06-307).
- ✓ Firefighter wearing a helmet avoids injury from a falling ladder (No. 06-451).
- ✓ Firefighter burns ears and other exposed skin when not wearing a hood (No. 07-846).
- ✓ New SCBA system and turnout gear contribute to near-miss incident (No. 05-496).
- ✓ Captain recalls water safety training after falling onto a snow-covered pool cover in full PPE and SCBA (No. 06-168).
- ✓ Instructor burned when not wearing SCBA during ignition of a training fire (No. 06-535).
- ✓ Firefighter suffers inhalation injuries when SCBA mask fills with smoke (No. 07-916).

## Vehicle Blocking Reports

- ✓ Firefighter in a blocked lane is nearly hit by a vehicle (No. 05-450).
- ✓ EMT's foot is run over by passing vehicle while assessing patients (No. 05-493).
- ✓ Firefighter struck by driver's side mirror of passing vehicle (No. 06-394).
- ✓ Privately owned vehicle used to block traffic proves to be inadequate (No. 06-513).
- ✓ Emergency personnel and patient dive over guardrail to protect themselves from oncoming vehicle (No. 05-277).
- ✓ Engine operator backs into police car and nearly pins firefighter between the two vehicles (No. 05-287).
- ✓ Fire chief's vehicle struck by motorist at accident scene (No. 06-141).
- ✓ Engine operator hit by civilian vehicle on "routine" EMS call (No. 06-542).

## Truss Construction Reports

- ✓ A free-burning roof and an unaware crew lead to an unexpected roof collapse (No. 05-166).
- ✓ Arson investigator warns crew about lightweight truss construction and how quickly it burns (No. 05-227).
- ✓ When roof collapses, firefighter is injured and rescued by another firefighter (No. 05-567).
- ✓ Ceiling collapse nearly traps two firefighters (No. 06-580).
- ✓ Truck crew investigates chimney fire on a tile roof to find attic involved (No. 06-104).
- ✓ Fire in walls and floors of lightweight construction leads to collapse (No. 06-165).
- ✓ Roof trusses fall on crew, firefighter escapes with minor scrapes (No. 06-580).

## Flashover Reports

- ✓ Breakdown in decision making forces a defensive attack (No. 06-132).
- ✓ Communication problems at structure fire result in crews becoming separated and almost trapped (No. 06-292).
- ✓ Lack of communication leads to a series of errors during a working house fire (No. 06-347).
- ✓ Intense heat during a training exercise causes firefighter's facepiece to catch fire and melt (No. 06-441).
- ✓ Fire instructor almost severely burned while restarting a fire for a training exercise (No. 06-493).
- ✓ Fire spreads too quickly in recruit training, forcing a sudden evacuation of 20 recruits (No. 06-586).
- ✓ Frozen hoseline creates problems at live burn training (No. 06-609).

# ANALYSIS

## MAYDAY REPORTS

“Mayday” is the last word a firefighter wants to call and an incident commander (IC) wants to hear. Maydays are emergency calls to all units on the scene that a firefighter is in trouble or in a dangerous position. Sometimes the situation is foreseeable and other times it happens unexpectedly and rapidly. All of the mayday reports analyzed in this working group had similar underlying causes that included human error, decision making, command, communication and individual action.

HFACS serves as a good analysis tool for departments to use during an intra-department critique after a mayday. By understanding the root cause of the near miss, skill sets can be developed on how to avoid these dangerous situations before they occur. An event like the one in Report No. 05-567 (read Case Study below) gives the opportunity to discuss many safety issues during fire operations.

### Case Study: *When roof collapses, firefighter is injured and rescued by another firefighter (No. 05-567).*

“As I went through the apartment, I observed a glow from the bathroom fan. I ordered the three-man crew with the attack line to open the ceiling and knock down the fire. I didn’t know if the roof was truss construction, so I advised them that if the fire was not knocked down in 10 seconds, we would pull out. I advised command of the situation. As the crew was knocking the fire down, the smoke began to clear in the apartment. As it cleared, I observed a room at the end of the hall had what appeared to be a kid’s bed. I advised the crew that I was going to check the room for any occupants. I went down the hall alone, still with PPE and SCBA, and entered the room. I heard a freight-train-like sound and all of a sudden, I was standing in a fully involved room. The roof had collapsed. I knew the door was to my left so I dove for the doorway but went headfirst into the wall. I knew there were two windows in the front of the room that faced Side A of the building. Even though I was on the third floor and would suffer injuries, I decided to dive for the windows because I was burning up. When I dove for the windows, I went headfirst into a dresser. After this, the pain was getting so bad. I was getting very confused, and I thought it was over. Just then another firefighter in the hallway heard me, saw my boot, grabbed my foot and pulled me into the hallway. I could not call for mayday because everything happened so fast.”

### Discussion Questions

This situation could have resulted in a mayday, injury or fatality. The rapid propagation of fire in a “clear” environment was due to the failure of load-bearing elements. Consider the following questions:

1. What signs regarding fire conditions can you discern from the reporter’s narrative?
2. Given the signs identified in question No. 1, how would you modify your actions if you were in the same situation as the reporter?
3. Do your department’s mayday drills include obscured vision and rescue operations?
4. Do you keep track of time vs. fire spread when you are operating inside a burning structure?
5. If you answered yes to No. 4, what is your “get-out” time? If you answered no, how can you determine your “get-out” time?

## PPE REPORTS

During initial training, firefighters learn the importance of correctly wearing PPE. But over time, many firefighters become complacent about PPE. As a result, firefighters are frequently injured because of the lack of PPE, not wearing PPE or wearing PPE improperly. *The bottom line:* Wearing PPE is one of the most fundamental acts a firefighter can perform to ensure individual safety.



PHOTO GERT ZOUTENDIJK

Using HFACS, the working groups identified patterns of behavior that were common in all reviewed reports. Unsafe acts were found in 100 percent of the reports involving PPE. Routine events like improper use or failure to use safety equipment (chin straps, waist straps, gloves and hoods) were found in 72 percent of reports. A willful disregard for policies, procedures and best practices was noted in 80 percent of the reports. The working group also looked at preconditions before the unsafe acts. Complacency, loss of situational awareness and overconfidence were contributing factors in all analyzed reports. Additionally, the working group identified a degree of inadequate supervision of personnel in all of the analyzed reports.

The following unsafe/inappropriate behaviors were identified:

- Failure to adequately brief personnel;
- Permitting unnecessary hazards;
- Allowing freelancing;
- Failure to enforce department rules/regulations;
- Authorizing unnecessary hazards;
- Failure to communicate; and
- Failure to lead.

The working group recommends the following practices to help prevent PPE-related injuries:

- Always take the extra time to make sure you're wearing your PPE properly;
- Check your crew before entering an IDLH atmosphere;
- Train on the proper use of PPE;
- Research new technologies in PPE;
- Company officers (COs) must lead by example by correctly using their PPE;
- ICs and COs must enforce the rules to ensure everyone wears and uses PPE properly;
- Chief officers must manage everything on the scene, including PPE usage; and
- If you experience a near-miss event with your PPE, submit a near-miss report so others can learn from your experience.

## RESOURCES

Visit [www.firefighternearmiss.com](http://www.firefighternearmiss.com) and click on "Resources" to access information for training and information sharing. Available are items such as videos and photos, PowerPoint presentations for education and drills, and analysis and statistics on the near-miss reporting system. Use "Submit a File" to send pertinent videos, photos, best practices and SOPs.

## VEHICLE BLOCKING REPORTS

Personnel must use extreme caution any time they are working at the scene of a vehicle accident. Civilians are often distracted by the lights and other activity on the scene. While their attention is focused on trying to see what happened, they may not notice emergency workers operating on the scene. It is therefore critical that safety officers monitor the scene and traffic flow to alert crews of dangers they may be unaware of. The working group noted that it is crucial for everyone on scene to be responsible for safety so everyone goes home safely.

The following excerpt from Report No. 05-493 is a typical vehicle-blocking report and illustrates the need to maintain situational awareness even at routine calls. The working group focused on HFACS Level 2: Precondition to Unsafe Acts when they analyzed this report.

"Our unit arrived on scene at approximately 7 a.m. the day of the incident. There were two vehicles involved in what appeared initially to be property damage only. There was one police car on scene blocking off the far left lane, and an engine crew as well blocking off the middle lane. Traffic was squeezing past the incident to the right of the two vehicles ... When I approached the vehicle on the right-hand side, the side where traffic was squeezing past, I entered the van from the rear passenger's side. I ascertained that there were now four more patients ... As I stepped forward to the patient in the front seat, my foot was run over by a passing vehicle. I stepped away from the van and walked toward the unit. My foot started to hurt immediately. I told my driver, and very soon after I was unable to walk on the foot. I became one of the patients! Four more units were dispatched!"

The working group noted that in many of the analyzed reports, ICs didn't seem to recognize the limited resources and didn't acknowledge what could realistically be accomplished with the available resources. The working group strongly recommended that crew safety be the first priority, followed closely by scene safety. They also recognized that scene safety and crew safety are intricately intertwined. Taking care of one often takes care of the other. One additional element was recognized: the role of law enforcement. The working group strongly urges fire departments to establish a relationship with law enforcement that ensures crew and scene safety.

<b>HFACS LEVEL 2: SUBSTANDARD CONDITIONS— ADVERSE MENTAL STATES</b>	<b>HFACS LEVEL 2: SUBSTANDARD PRACTICES— CREW RESOURCE MANAGEMENT</b>
<ul style="list-style-type: none"> <li>• Channelized attention and tunnel vision</li> <li>• Task saturation: multitude of tasks delegated to mitigate the situation</li> <li>• Complacency and distraction</li> </ul>	<ul style="list-style-type: none"> <li>• Failure to communicate</li> <li>• Failure to recognize task limitations</li> <li>• Failure to use all available resources</li> </ul>

# ANALYSIS



PHOTO JASON R. HENSKE/RYRPHOTO.COM

## TRUSS CONSTRUCTION REPORTS

The working group recognized time as a critical incident factor in fires involving trusses. The fire service has generally moved away from the antiquated “10-minute rule,” which recommends making a withdrawal if no progress was made on extinguishing the fire after 10 minutes. Though the reports analyzed routinely failed to give a timeline to truss failure, the working group inferred that the personnel involved still underestimated critical incident factors related to truss failure. This resulted in a loss of situational awareness (reality vs. perception). The working group members recalled their own experiences to identify the patterns in this group of reports, acknowledging that additional information, such as a timeline, would be helpful. The chart below is an example of analysis that can be performed with HFACS when looking at a group of reports on a particular topic.

Visit the Resources page at [www.firefighternearmiss.com](http://www.firefighternearmiss.com) for the handouts used in this analysis, including the seven near-miss reports and the completed worksheets used by the working group. Use them to generate discussion to determine if you agree or disagree with their findings. E-mail your comments to [info@firefighternearmiss.com](mailto:info@firefighternearmiss.com).

Identified Patterns in Truss Construction Reports			
HFACS LEVEL 1: UNSAFE ACTS	HFACS LEVEL 2: SUBSTANDARD CONDITIONS	HFACS LEVEL 2: SUBSTANDARD PRACTICES	HFACS LEVEL 3: SUPERVISION
<ul style="list-style-type: none"> <li>• Failure to request additional resources</li> <li>• Failure to sound the floor or roof</li> <li>• Failure to conduct a thorough size up</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of situational awareness</li> <li>• Misplaced motivation</li> <li>• Complacency and distraction</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of communication</li> <li>• Failure to recognize task limitations</li> <li>• Failure to use all available resources</li> </ul>	<ul style="list-style-type: none"> <li>• Absence of supervision</li> <li>• Guidance was not provided</li> <li>• Oversight was limited</li> </ul>

## FLASHOVER REPORTS

Flashovers occur when surfaces and objects within a room or space have been heated to their ignition temperature and burst into flames. Flashover temperatures can peak at about 2,000 degrees F. Companies usually arrive on the scene during the growing stages of flashover. The two warning signs of flashover are high heat and smoke banked down with flame rollover.

The three ways to delay or eliminate flashover conditions include:

- Venting the structure or room to release the heat and gases;
- Closing off the room to starve the oxygen inside; and
- Directing a stream at the ceiling to cool the upper atmosphere without disrupting the thermal balance.

Flashover can lead to structural collapse. It is important for firefighters to recognize the conditions and warning signs of flashover to prevent injury or death.

The flashover working group looked at four different types of flashover reports: training, combustion, rollover and collapse. For the following case studies, the working group offers recommendations for different levels of firefighters. Additionally, the working group used HFACS to identify individual and organizational factors. This same exercise could be repeated with a different topic for use in a training program.

The following excerpt is from Report No. 06-441, which took place in a flashover simulator:

“I can recall my hands and shoulders burning. I also recall smelling smoke or plastic burning through my mask and thought it may be a leak of some sort in my seal. Smoke is really thick and flickers of rolling fire overhead. As flashover occurs I was able to look up through my mask and see it was melting.”

RANK	WORKING GROUP RECOMMENDATIONS
<i>Firefighters</i>	Inspect equipment and bring safety issues to officer's attention.
<i>Company Officers/ Training Officers</i>	Conduct an inspection of all equipment, a briefing of the training exercise and a walkthrough of the facility. Safety practices must be reviewed, including what to do if something goes wrong, with all personnel.
<i>Chief Officers</i>	Ensure that all training personnel are qualified and that policies/procedures are followed. The training facility and equipment must meet NFPA standards.

HFACS LEVEL	WORKING GROUP DETERMINATION
<i>Unsafe Acts</i>	Latent actions of others contributed to near miss. Violations included failure to use proper safety equipment, failure to follow best practices and failure to conduct a risk/benefit analysis for all resources.
<i>Preconditions to Unsafe Acts</i>	There was a loss of situational awareness and a failure to recognize conditions in a timely manner.
<i>Supervision</i>	Guidance, oversight and training were not provided. Personnel were not briefed and they were permitted to engage in unnecessary hazards.
<i>Organizational Influences</i>	Inadequate equipment was used. Safety programs were not in place during near-miss event.

## REPORT OF THE WEEK

Sign up for the Report of the Week (ROTW), a free weekly e-mail that details a submitted report, analyzes the incident and provides training questions. E-mail [nearmiss@iafc.org](mailto:nearmiss@iafc.org) with “Subscribe-AR08” in the subject line.

## CALENDAR 2008

If you didn't get your 2008 Near-Miss Calendar in the November issue of *FireRescue* magazine, contact us at [info@firefighternearmiss.com](mailto:info@firefighternearmiss.com), and we'll send you a complimentary copy. Visit the Resources Page for monthly drills.

# ANALYSIS

PHOTO: LAS CRUCES (N.M.) FIRE DEPARTMENT



## Phase 1 Flashover Report

The first phase of flashover results from the ignition of flammable gases that have accumulated in the upper areas of the fire. As this happens, the radiant heat of the original fire is heating nearby combustibles: walls, furniture—everything in the room. All items start giving off flammable gases (pyrolysis). Smoke banks down quickly, reducing visibility dramatically.

The following excerpt is from Report No. 06-132: “I gave him a report—conditions are heavy smoke to the floor with no visibility and high heat. Our thermal imaging camera ‘whited’ out on my crew, the heat was dramatically increasing and we had water flowing for at least 1 ½ minutes. We knew our water was not going to last much longer. I pulled my crew out while hitting the fire to prevent flashover.”

RANK	WORKING GROUP RECOMMENDATIONS
<i>Firefighters</i>	Recognize the importance of following assigned tasks based on your department’s SOPs.
<i>Company Officers</i>	Follow SOPs and maintain crew integrity at all times.
<i>Chief Officers</i>	Establish and maintain command and control with the appropriate assignments of companies and accountability of personnel (proper span of control, 3–5 members).

HFACS LEVEL	WORKING GROUP DETERMINATION
<i>Unsafe Acts</i>	Individual acts and latent actions of others contributed to the near miss. There were violations of established best practices. The first truck pulled a line rather than venting and searching, per the SOP. The second engine pulled a handline rather than establishing a water supply, per the SOP. Three lines deployed without a water supply.
<i>Preconditions to Unsafe Acts</i>	Assignments occurred without a water supply. Resources were not appropriately used.
<i>Supervision</i>	Unnecessary hazards were authorized and unsafe behaviors (free-lancing) were allowed.
<i>Organizational Influences</i>	The organizational climate seemed to allow for aggressive free-lancing, and they did not appear to have safety programs in place.

### Phase 2 Flashover Report

The second phase of flashover is the rollover or flaming of gases near the ceiling. This may appear as small flashes in dense smoke or a rolling wave of flames across the ceiling. The fire changes to an aggressive, fast-moving fire very quickly.

The following excerpt from report No. 06-347 highlights the nature of flashovers during rollover: “The first engine arrives and finds a two-story, single-family dwelling with heavy fire in the garage area and fire through the roof extending into the second-floor living area. The first engine officer calls for water to cool down and protect his crew while they force entry to the front door. He then orders the crew to take the window and go inside to unlock the front door. The crew determines there was too much stuff to make entry and they proceed to Side C. The crew attempts to force the back door but is unsuccessful. They finally force a window next to the rear door and are ordered to make entry. Their lieutenant stays outside because of problems with his hood and gloves. Evacuation tones commence and the first engine tries contacting the crew with no success. As the evacuation tones are going off a ladder tower forces entry to the front door and the two unaccounted firefighters come out.”

#### **SAFETY, HEALTH & SURVIVAL WEEK**

The 2008 Fire/EMS Safety, Health and Survival Week (formerly known as Stand Down) is June 22–28. During this week, please use [www.firefighternearmiss.com](http://www.firefighternearmiss.com) for reports, photos, PowerPoint presentations and much more that can be used for table top or live training exercises. For more information please visit the IAFC Safety, Health and Survival Section Web site, [www.iafcsafety.org](http://www.iafcsafety.org).

RANK	WORKING GROUP RECOMMENDATIONS
<i>Firefighters</i>	Maintain crew integrity (stay with your officer). Know and follow assigned tasks per SOPs.
<i>Company Officers</i>	Lead by example by following SOPs at all times. Know where your subordinates are at all times.
<i>Chief Officers</i>	Ensure that all training personnel are qualified and that policies/procedures are followed. The training facility and equipment must meet NFPA standards.

# ANALYSIS



PHOTO: LOUISVILLE (KY) FIRE DEPARTMENT

HFACS LEVEL	WORKING GROUP DETERMINATION
<i>Unsafe Acts</i>	Active and latent actions contributed to the near miss. Critical incident factors were misinterpreted. There was not a thorough risk/benefit analysis.
<i>Preconditions to Unsafe Acts</i>	There was a loss of situational awareness while in the midst of task saturation.
<i>Supervision</i>	Unnecessary hazards were authorized and department's SOPs were not enforced. Personnel were not briefed.
<i>Organizational Influences</i>	Organizational climate appeared to be fast-paced, aggressive and without a safety program.

### Phase 3 Flashover Report

The final phase of a flashover is thermal collapse. Intense radiant heat is felt from everywhere. You can no longer get under the thermal balance (stratified layer of heat and smoke). The intense heat drops to floor level.

The following excerpt is from report No. 06-292: “After the first two apartments were searched, all of us moved down the hallway to the next set of apartments. I observed the ceiling behind us collapse into the hallway onto the hoseline. I made an attempt to contact the IC to notify him of our position and the collapse. He did not reply. Assuming the chief could not hear me, I removed my SCBA regulator and attempted to call again. While making this call I fell into the floor; my legs were dangling into the first floor.”

#### REPORT REVIEWING REMINDERS

- ✓ The recommendations and incident analysis are intended to generate discussion for the purpose of promoting firefighter safety.
- ✓ Discourage passing judgment on individuals in the reports. Reporters are commended for their courage to report a near-miss event.
- ✓ Put yourself in the shoes of the reporter to better understand their decision-making process.

RANK	WORKING GROUP RECOMMENDATIONS
<i>Firefighters</i>	Train and retrain on SCBA, mayday and emergency radio communications.
<i>Company Officers</i>	Train and retrain and train again on SCBA, mayday and emergency radio communications.
<i>Chief Officers</i>	Develop and ensure compliance with policies and procedures for SCBA, mayday and emergency communications.

HFACS LEVEL	WORKING GROUP DETERMINATION
<i>Unsafe Acts</i>	Active and latent actions contributed to the near miss. Critical incident factors were misinterpreted. There were violations of SOPs and best practices.
<i>Preconditions to Unsafe Acts</i>	Conditions and task limitations were not recognized in a timely manner.
<i>Supervision</i>	Unnecessary hazards were authorized and department’s SOPs were not enforced.
<i>Organizational Influences</i>	Organizational climate appeared to traditionally fast-paced, aggressive and without risk management or safety program.

### WORKING GROUP FACILITATORS

**FLASHOVERS:** Captain Rick Atkins (Ret.), Fairfax County (Va.) Fire & Rescue Department

**PPE:** Captain Rob Clemons, Prince William County (Va.) Department of Fire & Rescue

**TRUSS CONSTRUCTION:** Battalion Chief Greg Lindsay, Oklahoma City (Okla.) Fire Department

**MAYDAYS:** Chief Steve Mormino, South Farmingdale (N.Y.) Fire Department/Lieutenant, Fire Department of New York

**VEHICLE BLOCKING:** Captain Brad Van Ert, Downey (Calif.) Fire Department

# PROGRAM TESTIMONIALS

“Our job is to save lives & property. It’s also our job to help our fellow firefighters & this is one of the best ways to do that.”

—07-985 Reporter to Reviewer

“The Department encourages all members to participate in both reviewing & contributing to the National Fire Fighter Near-Miss Reporting System. This is an excellent Web site that is easy to navigate. Familiarization with this program will help promote discussions on near-miss incidents as well as other safety concerns.”

—Assistant Chief Allen S. Hay  
Fire Department of the City of New York

“Reporting, collecting & using this data enhance our ability to learn to work more safely. We will never know the firefighters we are helping but they are out there.”

—07-965 Reporter to Reviewer



PHOTO CAPT. ROB BRISLEY / CHARLOTTE (N.C.) FIRE DEPARTMENT

“To hear seasoned firefighters talk about cultural change, risk management, the big picture & slowing down has been very encouraging. Near-miss reports are a great tool, & I encourage every department to incorporate them into their training programs wherever they can.

—Tim Sendelbach  
President  
International Society of  
Fire Service Instructors

“I got my crew together to watch me fill out the report to show how easy it was to submit a report. We reviewed the incident & then did a search of similar reports. I think this is the best way for people to get over any concerns they may have about submitting a report.”

—07-1139 Reporter to Reviewer

“I was motivated to file the report because we were very close to being in a serious accident. This was a way for me to get information out to other firefighters to prevent similar incidents. It was very easy to enter the report.”

—07-931 Reporter to Reviewer

“We use the Report of the Week as our weekly safety briefing. There have been days when I can hear them still discussing the incident hours after the briefing. I have had zero work-related incidents this year largely due to this program.”

—Chief Thomas J. Braumuller, Pine  
Bluff Arsenal Fire & Emergency Services (Ark.)

“I use the keyword search to find reports for my training needs. It is easy to use, & I can quickly scan a lot of reports to find the ones I want to use.”

—07-944 Reporter to Reviewer

“Having the ability to learn from brothers & sisters in the fire service about near-miss events is essential. We must know about near miss events to break the cycle of line-of-duty injuries and deaths. The Near-Miss Reporting System is a great resource & will help reduce injuries by conveying information to all ranks of the fire service. Because of the Near-Miss Reporting System’s confidentiality & easy access, I see why so many people have reported the incidents that have happened to them or their department.”

—Jay Blake  
Master Firefighter  
Montgomery County (Md.) Fire & Rescue Service  
IAFF Local 1664

“Thank you to everyone who has submitted a report. My department has been using the system for more than a year & we are seeing positive results because of it. We use the Report of the Week regularly for training bulletins.”

—07-957 Reporter to Reviewer

#### **AWARD**

The 2007 National Fire Fighter Near-Miss Reporting Safety Leadership Award was given to the Frankfort (Ill.) Fire Protection District. This year it could be your department. Submit an essay (not more than 500 words) for the 2008 award on how your department is using [www.firefighternearmiss.com](http://www.firefighternearmiss.com). Visit the Resources Page, “Award Info” tab for more details.

# ANNOUNCING THE SECOND ANNUAL NATIONAL FIRE FIGHTER NEAR-MISS AWARD



How does your department demonstrate its commitment to firefighter safety by using the National Fire Fighter Near-Miss Reporting System or the "Report of the Week"?

Any member of your department can submit an essay of 500 words or less that answers the questions:

- How was the program implemented in your department?
- How has the program contributed to the safety culture in your department?
- What challenges were overcome to gain acceptance of the program?

The winner will be announced at Fire-Rescue International 2008 in Denver.

The deadline for submission is July 11, 2008.

E-mail your essay to [nearmiss@iafc.org](mailto:nearmiss@iafc.org)  
or mail it to Near-Miss Program,  
4025 Fair Ridge Drive, Fairfax VA 22033.  
For more information, call Amy Hullman at  
703-537-4848 or e-mail [ahullman@iafc.org](mailto:ahullman@iafc.org).



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## PRE-CONFERENCE WORKSHOP

### FIRE-RESCUE INTERNATIONAL 2008 IN DENVER

Participate in a 1-day, free workshop examining near miss reports using a human factors classification system. The findings from this workshop will culminate in the 2008 Annual Report for the National Fire Fighter Near-Miss Reporting System. Enrollment is limited, so hurry.

E-mail [nearmiss@iafc.org](mailto:nearmiss@iafc.org) for more information.