STATE FIRE MARSHAL'S OFFICE

Firefighter Fatality Investigations

ANNUAL REPORT
FY 2013

Texas Department of Insurance
Austin, Texas

October 2013

Table of Contents

Executive Summary

During the State of Texas Fiscal Year 2013 (September 1, 2012 to August 31, 2013), the State Fire Marshal's Office (SFMO) conducted seven firefighter fatality incident investigations, involving twenty fatalities.

The following table provides information on the firefighter fatalities.

Firefighter Name	Date of Death	Incident Description
Captain Neal Smith *Atascocita VFD*	September 17, 2012	Collapse on training ground September 16, 2012 – Heat Related Illness
Firefighter Jalen Smith *Jackson Heights VFD*	December 3, 2012	Ejected from motor vehicle during response to incident on November 30, 2012
Lt. Gregory Pickard Lt. Eric Wallace *Bryan FD*	February 16, 2013	Injuries received during fireground operations at Knights of Columbus fire beginning February 15, 2013
Assistant Chief David Fox *Bluebonnet VFD*	February 20, 2013	Heart attack while driving department vehicle February 14, 2013
Firefighter Jerry Chapman Captain Cyrus Reed *Abbott VFD* Firefighter Kevin Sanders *Bruceville-Eddy VFD* Captain Kenneth Harris *Dallas Fire Rescue* Firefighter Perry Calvin *Mertens VFD* Firefighter Morris Bridges Firefighter Cody Dragoo Firefighter Joseph Pustejovsky Captain Douglas Snokhous Captain Robert Snokhous *West VFD*	April 17, 2013	Injuries received during fireground operations at a fertilizer plant fire and explosion on April 17, 2013

Firefighter Stanley Wilson *Dallas Fire Rescue*	May 20, 2013	Injuries received during fireground operations at a condominium fire and building collapse beginning May 19, 2013
Engineer–Operator Robert Bebee Firefighter Robert Garner Captain Matthew Renaud Firefighter Anne Sullivan *Houston FD*	May 31, 2013	Injuries received during fireground operations and building collapse on May 31, 2013

Texas Firefighter Fatality Investigation Authority

In 2011, the 82nd Legislature enacted SB 396, requiring the SFMO to investigate firefighter fatalities occurring “in the line of duty or in connection with an on-duty incident.” This bill expands the investigative jurisdiction of the SFMO, which had previously investigated only those fatalities occurring in connection with a firefighting incident. This change took effect May 12, 2011.

The statute requires the SFMO to investigate the circumstances surrounding the death of the firefighter, including factors that may have contributed to the death of the firefighter. The term "firefighter" includes an individual who performs fire suppression duties for a governmental entity or volunteer fire department.

The State Fire Marshal is required to coordinate the investigative efforts of local government officials and may enlist established fire service organizations and private entities to assist in the investigation. The State Fire Marshal has appointed an Investigation Panel to provide Firefighter Fatality Investigation Program policy guidance. The following entities serve on the Firefighter Fatality Investigation Panel:

- State Firemen's & Fire Marshals' Association of Texas
- Texas State Association of Fire Fighters
- Texas Fire Marshal's Association
- Texas Fire Chiefs Association
- Texas Commission on Fire Protection
- Texas A&M Forest Service
- Texas Engineering Extension Service, Emergency Services Training Institute, Texas A&M University System
- Texas metropolitan fire departments (including Austin, Dallas, El Paso, Fort Worth, Houston, and San Antonio)

The Texas Commission on Fire Protection (TCFP) is charged with developing and establishing criteria to receive and analyze injury information pertaining to Texas firefighters, and to transmit its report to the State Fire Marshal for inclusion in this annual report, through §419.048 of Senate Bill 1011, passed during the 81st Legislature.

The Texas Commission on Fire Protection’s firefighter injury reporting program has completed its 2012 annual report, which is available on the commission’s website, http://www.tcfp.texas.gov/reports/TCFP_Injury_Report_2012.pdf

Fiscal Year 2013 Investigation Summary

September 17, 2012 – Medical
***Neal Wade Smith*, Captain**
Atascocita Volunteer Fire Department
Hyperthermia (Heat Related Illness) while training

On September 16, 2012, Captain Smith collapsed during training at a facility located in Beaumont, Texas. The training was a twenty-hour class conducted over the two-day weekend of September 15 and 16, 2012, titled "Smoke Divers," a physically and mentally demanding firefighter survival course with emphasis on the use and familiarization of the self-contained breathing apparatus (SCBA). Captain Smith was nearing completion of the course and collapsed during the final drill on the second floor of a six floor training tower. This was the second day of the two-day class.

An autopsy conducted on September 19, 2012, revealed that Captain Smith died of hyperthermia.

December 3, 2012 – Motor Vehicle Accident
***Jalen Shaquille Smith*, Firefighter**
Jackson Heights Volunteer Fire Department
Injuries sustained in a motor vehicle accident

On November 30, 2012, Volunteer Firefighter Jalen Smith, 20, was responding to a report of a vehicle accident in a personally owned vehicle driven by a friend. The driver lost control of the vehicle and left the roadway resulting in a rollover ejecting Firefighter Smith. On December 3, 2012, Firefighter Jalen Smith died of the injuries.

February 16, 2013 – Knights of Columbus structure fire
***Gregory Wade Pickard*, Lieutenant**
***Frank Eric Wallace*, Lieutenant**
Bryan Fire Department
Burn injuries sustained during fireground operations

On February 15, 2013, Lt. Pickard and Lt. Wallace responded to the report of a structure fire at the Knights of Columbus hall located in Bryan, Texas. During interior operations Lt. Wallace became separated from his crew and radioed for help. Lt. Pickard, along with Firefighter Ricky Mantey, and Firefighter Mitchell Moran, who were assigned to the Rapid Intervention Team attempted the rescue of Lt. Wallace. The fire progressed to flashover conditions and the fire enveloped the firefighters, causing fatal

injuries to Lt. Wallace and Lt. Pickard, and near fatal injuries to Firefighter Mantey and Firefighter Moran.

Autopsy examinations conducted at separate facilities revealed Lt. Wallace died from conflagration injuries and Lt. Pickard died from thermal injuries and smoke inhalation.

February 20, 2013 – Medical
***David Fox*, Assistant Chief - Medical**
Bluebonnet Volunteer Fire Department
Cardiac Arrest

On February 14, 2013, Assistant Chief Fox suffered a severe heart attack while driving a department vehicle on his way home from a week long training conference in Corpus Christi. Assistant Chief Fox was driving with three members of Bastrop County Emergency Services District #1 when he stated that he was having severe chest pains and stopped the unit. While continuing to the nearest hospital, an ambulance met them on the road and Chief Fox was transferred to the ambulance and transported to a hospital in Gonzales, Texas. Chief Fox was stabilized and air-lifted to a hospital in Austin, Texas, where he passed away on February 20, 2013.

April 17, 2013 – Adair Fertilizer Company structure fire and explosion
***Cyrus Reed*, Captain**
***Jerry Chapman*, Firefighter**
Abbott Volunteer Fire Department

***Kevin Sanders*, Firefighter**
Bruceville-Eddy Volunteer Fire Department

***Kenneth Harris*, Captain**
Dallas Fire Rescue

***Perry Calvin*, Firefighter**
Mertens Volunteer Fire Department

Morris Bridges, Firefighter
Cody Dragoo, Firefighter
Joseph Pustejovsky, Firefighter
Douglas Snokhous, Captain
Robert Snokhous, Captain
West Volunteer Fire Department
Blunt force injuries from an explosion during fireground operations

On April 17, 2013, a fire was reported at the Adair Fertilizer Plant in the city of West, Texas. The West Volunteer Fire Department responded and found a heavily involved structure fire. Mutual aid and additional firefighters from area departments responded. Firefighters attending an emergency medical technician class responded from the West Emergency Medical Services building located a few blocks west of the fertilizer plant.

The structure involved was the seed and fertilizer building at the plant. The building contained separate areas and bins storing seeds and chemicals used in the farming community. The chemicals were mixed at the plant according to each customer's specifications. Chemicals included ammonium nitrate, potash, ammonium sulfate, diammonium sulfate, and KMAG – a mixture of potassium, magnesium, and sulfur.

As the building became more involved, the roof collapsed and an explosion occurred. The blast killed ten firefighters, two civilians responding to assist, and three civilians in the residential area west of the plant. Several more responding firefighters suffered near fatal injuries.

Autopsies of the firefighters revealed they died of blunt force trauma injuries.

May 20, 2013 – Hearthwood Condominiums structure fire
***Stanley Wilson*, Firefighter**
Dallas Fire Rescue
Injuries from structure collapse

On May 20, 2013, at 2:51 A.M., Dallas Fire Rescue Dispatch received a call from an alarm monitoring company advising that the alarm system located at the Hearthwood North 2 Condominiums, 12363 Abrams Road, Dallas, Texas, had activated. Firefighter Wilson responded to the scene on Truck 53 at 4:05 from Station 57 on the fourth alarm of the six-alarm fire. Truck 53 was assigned to evacuate an adjacent building in the complex and then received orders to conduct a primary search of the ground floor of the fire building. Shortly after beginning the primary search, a portion of the structure collapsed, fatally injuring Firefighter Wilson.

Autopsies revealed that Firefighter Wilson died of mechanical compression of the chest causing asphyxia.

May 31, 2013 – Southwest Inn structure fire
***Robert Bebee*, Engineer Operator**
***Robert Garner*, Firefighter**
***Matthew Renaud*, Captain**
***Anne Sullivan*, Probationary Firefighter**
Houston Fire Department
Thermal and trauma injuries sustained from structure fire and collapse

On May 31, 2013, at 12:07 P.M., the Houston Fire Department received a call of a reported structure fire at 6855 Southwest Freeway. Engine 51 was first on scene and staffed with Captain Renaud, E/O Bebee and two others. They radioed to incoming companies that they had "heavy smoke showing." Engine 51 advised that an offensive attack was being initiated with a 2½" hose line. Engine 51 reported a thermal imager reading of 184 degrees at the front door. As the crew entered the structure they found heavy, black smoke banked down 3'-4' above the floor. After advancing approximately 10' inside the building the crew began opening the ceiling which revealed fire overhead. The Engine 51 crew was advised that water supply was low and they returned to the entry doorway.

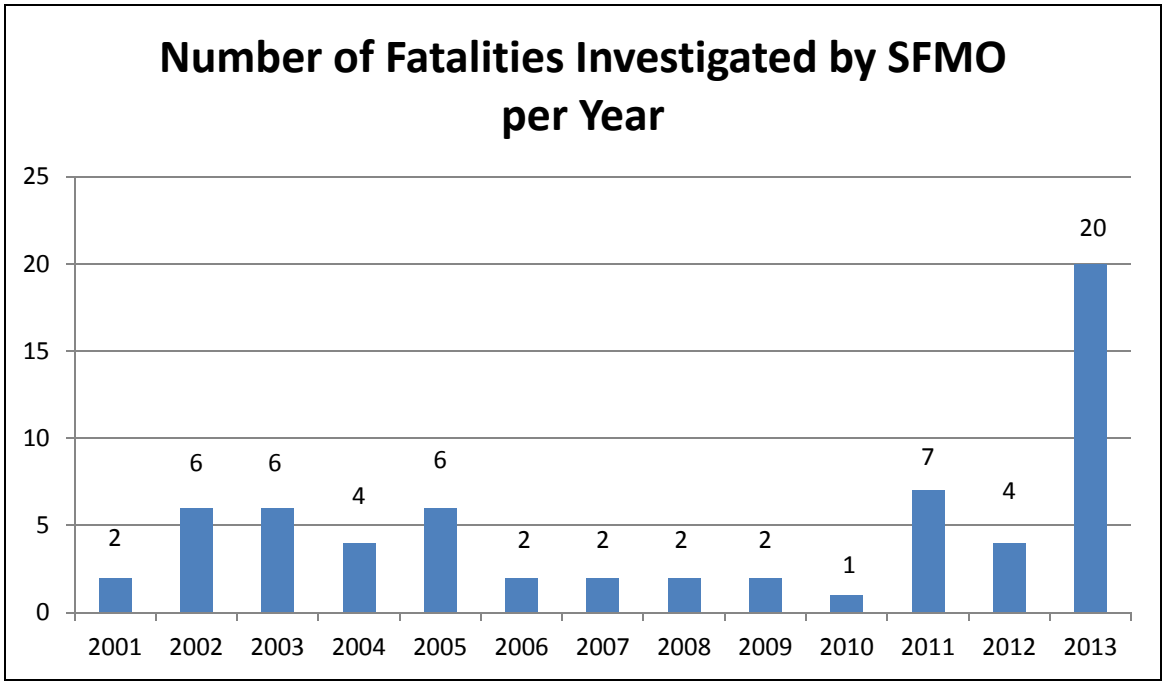
Engine 68 was the second in engine and was staffed with Firefighter Garner, Probationary Firefighter Sullivan and two others. Engine 68 staged at a hydrant and began water supply operations to Engine 51. As water supply was re-established the Engine 51 crew returned to the interior. As the crew advanced, the Engine 51 firefighter returned to the doorway to pull hose line passing the Engine 68 Captain, Probationary Firefighter Sullivan and Firefighter Garner. As the Engine 51 firefighter reached the doorway, he heard a noise as the roof collapsed and was pushed through the doorway by the collapsing roof structure. The collapse and fire of the structure fatally injured four and caused near fatal injuries to Engine 68 Captain Dowling.

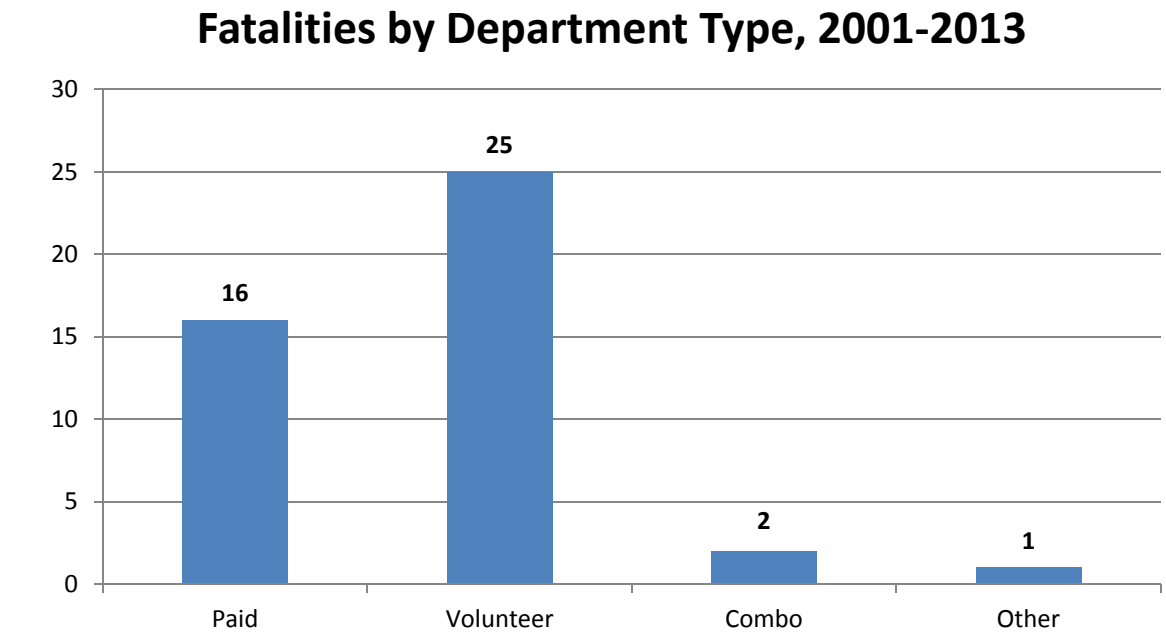
Autopsy examinations revealed the firefighters died from thermal injuries, smoke inhalation, and compression asphyxia.

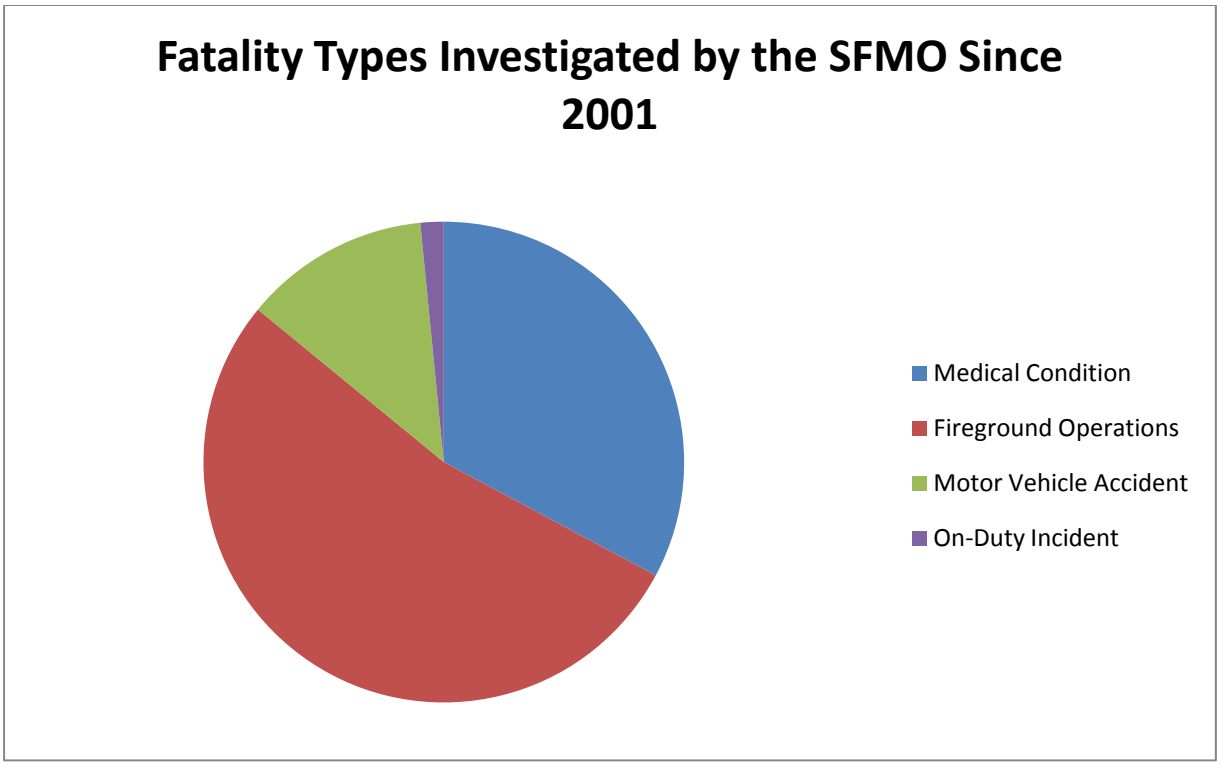
Statistics and Comparisons of Firefighter Fatalities

National Statistics Based on *Calendar Year*, Texas Statistics Based on *Fiscal Year* (September-August)

Source: National Fire Protection Association. *Firefighter Fatalities in the United States in 2012*.
The 340 firefighter deaths at the World Trade Center are not included in the number of 2001 deaths.




Fatalities by Department Type, 2001-2013
30
25
20
15
10
5
0
16
25
2
1
Paid
Volunteer
Combo
Other


Fatality Types Investigated by the SFMO Since 2001
Medical Condition
Fireground Operations
Motor Vehicle Accident
On-Duty Incident

Strategies for Preventing Firefighter Fatalities

The State Fire Marshal's Office encourages utilization of strategies developed by the State Fire Marshal's Office and nationally recognized organizations in the effort to reduce firefighter fatalities:

- The State Fire Marshal's Office communicates the "lessons learned" from firefighter fatality investigations through the publication of investigation reports, dissemination of information to the Firefighter Fatality Investigation Panel, and presentations at fire service conferences.

- Firefighter fatality investigation reports are sent to the affected fire departments and placed on the agency's website for access by the fire service, media, and the public.

- United States Fire Administration (http://www.usfa.fema.gov) statistics indicate that heart attacks are the chief cause of firefighter deaths. The National Volunteer Fire Council provides information on how to be heart healthy (http://www.healthy-firefighter.org).

- Participating in the "Firefighter Safety Stand Down," sponsored by the International Association of Fire Chiefs (www.iafc.org) and the International Association of Fire Fighters (www.iaff.org).

- Participating in the "Courage to be Safe" (CTBS) program that emphasizes the message "Everyone Goes Home." Information on the CTBS program is available online at http://www.everyonegoeshome.com.

- Implementing or expanding existing fire prevention programs to assist in reducing the number of fires.

- Participating in the National Fire Service Seat Belt Pledge (www.firehero.org) by National Fallen Firefighters Foundation, which encourages firefighters to wear seat belts when riding in a fire department vehicle.

- Exploring safer strategies and tactics for fighting fires in enclosed structures by publishing findings and recommendations revealed during firefighter fatality investigations.

- Providing information to the fire service and the public on the effectiveness of residential sprinklers in reducing civilian and firefighter fatalities as well as property loss caused by fire.

- Pre-fire incident planning in high-risk occupancies by suppression personnel in their response area. The pre-fire planning should include consideration of life safety for firefighters and occupants, water supply, and structural hazards.

- Including fire prevention and firefighter fatality prevention in all firefighter training and education, including initial training in firefighter academies across the state, as a top priority.

- Emphasizing the need for firefighter training on how modern construction technologies such as lightweight structural materials and green building practices can change building performance and fire behavior (http://www.greenbuildingfiresafety.org/), and how these new technologies impact firefighter safety and fireground operations.

Firefighter Safety Recommendations

The following are some recommendations from past reports of investigations conducted by the State Fire Marshal's Office.

1. Fire departments should establish standard operating procedures (SOPs) for minimum requirements of a fire service related occupational safety and health program in accordance with the ***National Fire Protection Association (NFPA) Standard 1500,*** *Standard on Fire Department Occupational Safety and Health Program,* 2007 Edition**.**

2. Provide mandatory pre-placement and annual medical evaluations to all firefighters consistent with ***NFPA 1582***, *Standard on Comprehensive Occupational Medical Program for Fire Departments,* 2007 Edition*,* to determine their medical ability to perform duties without presenting a significant risk to the safety and health of themselves or others.

3. Perform an annual physical performance (physical ability) evaluation to ensure firefighters are physically capable of performing the essential job tasks of fire fighting. ***NFPA 1583***, *Standard on Health Related Fitness Programs for Firefighters,* 2008 Edition*.*

4. Ensure that firefighters are cleared for duty by a physician knowledgeable about the physical demands of firefighting, the personal protective equipment used by firefighters, and the various components of ***NFPA 1592,*** *Standard on Comprehensive Occupational Medicine Program for Fire Departments.*

5. No risk to the safety of personnel shall be acceptable where there is no possibility to save lives or property. ***NFPA 1561****,* Chapter 5 Section 5.3.19
Texas Commission on Fire Protection Standards Manual*,* Chapter 435, Section 435.15, Part b, Paragraphs 1 and 2

6. Always attack a wildland fire from the burned area. If this is done and a sudden change in conditions or wind occurs, the unit can retreat further into the black where fuel has previously been consumed.
Texas Forest Service, *"Attack from the Black"* training DVD, "The black is the best safety zone" *http://txforestservice.tamu.edu/main/popup.aspx?id=9514*
National Wildfire Coordinating Group*, Fireline Handbook, NWCG Handbook 3,* March 2004

7. Egress routes and safety zones should be well identified and communicated to everyone on the scene before fire operations begin. Staging areas should be set

up to not interfere with ingress or egress, to afford safety to the firefighters using the areas.
NFPA 1143*,* Annex Section 5.4.2
Texas Commission on Fire Protection Standards Manual*,* Chapter 435, Section 435.15, Part a
National Wildfire Coordinating Group*, Fireline Handbook, NWCG Handbook 3,* March 2004, Chapter 1, Firefighter Safety

8. All firefighters on the scene of a fire and actively engaged in firefighting operations should be in approved full personal protective equipment (PPE) suitable for the type of fire incident. ***National Wildfire Coordinating Group****, Fireline Handbook, NWCG Handbook 3,* March, 2004, Chapter 1, Firefighter Safety

9. Fire departments must use a system of accountability whereby the incident commander can easily and immediately be able to determine not only that a firefighter is on the fireground but his location and task assignment at any given time. ***Texas Commission on Fire Protection Standards Manual****,* Chapter 435, Section 435.13, Part b, Paragraphs 3 and 4; and Part d

10. Instruct firefighters and command staff that hydration alone will not prevent heat-related illness (HRI). ***NIOSH*** *Report F2011-17,* April 2012

11. Stationary Command: A stationary command offers many advantages; one of the most important is a quiet vantage point from which to receive, process, and relay information. A stationary command post remote from task level operations is also beneficial in building and maintaining an effective fireground organization.
NFPA 1561, 5.3.7.1 "Following the initial stages of the incident, the incident commander shall establish a stationary command post."
Allan V. Brunacini (2002) *Fire Command*, (2nd Edition), Chapter 1, "The Command Post," Von Hoffman Corp.
IFSTA (2008) *Essentials of Fire Fighting*, (5th Edition), Chapter 1, page 39, Fire Protection Publications, Oklahoma State University

12. The use of all PPE including SCBA is mandatory when operating in areas where members are exposed or potentially exposed to the hazards for which PPE is provided.
NFPA 1500*,* Chapter 7, Protective Clothing
IFSTA, *Essentials of Fire Fighting,* (5th Edition), Chapter 5
Texas Commission on Fire Protection Standards Manual, Chapter 435, Fire Fighter Safety

13. Use tools and tactics that help reduce the dangers of roof operations. Become familiar with those indicators that are a precursor to collapse.

IFSTA (2008) *Essentials of Fire Fighting,* (5th Edition), Chapter 11, pp.476 and 556-560, Fire Protection Publications, Oklahoma State University
IFSTA (1994) *Fire Service Ventilation,* (7th Edition), pp. 86-89, Fire Protection Publications, Oklahoma State University

14. Consider monitoring and recording fireground activity. ***NFPA 1221,*** Chapter 7, Sec. 7.6, Recording

Appendix

Texas Commission on Fire Protection

January 1, 2012 to December 31, 2012

Executive Summary

This report details the abstract, the mission, the reports, information and data collected, as well as user-community input. The report goes on to include firefighter injuries in 2012 with charts and graphs depicting the collected information. The report also compares with National Fire Protection Association (NFPA) U.S. Firefighter Injuries - 2011.

The commission has enacted rules pertaining to the reporting of injuries in Texas Administrative Code (TAC) Title 37, Chapter 435, and has established the criteria and policies for reporting and analyzing the information. The commission finished implementation of the data systems necessary to gather this information in May 2010. Development is ongoing as we receive feedback from stakeholders on the efficiency of the system. The entire process is currently accomplished online through the commission's website. Every fire department regulated by the commission has been notified of the requirement to report. Several volunteer departments, which are not regulated by the commission, are also participating voluntarily.

The commission's report includes two fatalities. The fatalities listed in this report are only those reported to the Texas Commission on Fire Protection (TCFP). These fatalities are not the only fire service-related deaths that occurred in Texas during the reporting period, but the commission has no statutory authority to require reporting by departments it does not regulate. The same is true for the gathering of injury data. The commission relies on the fire service to submit complete injury data so that comprehensive reports can be produced.

Under §419.048, the Texas Commission on Fire Protection is charged with developing and establishing criteria to receive and analyze injury information pertaining to Texas firefighters. The commission reviews this information to develop recommendations to reduce fire protection personnel injuries. The commission provides this information to the State Fire Marshal's Office (SFMO) by September 1 of each year for inclusion in the SFMO's annual *Firefighter Fatality Investigations Report*.

This report concludes with recommendations from the commission.

Abstract

Texas Commission on Fire Protection received 4,264 reported injuries in calendar year 2012; 889 injuries were reported in Fire Suppression. This is 20.85 percent of the total injuries reported. An even larger number of reported injuries were in Emergency Medical Services (EMS), at 1, 242 (29 percent). The next biggest group was Station Duties, with 741 (17 percent). The last two groups are Skills Training and Wellness/Fitness with 486 (11.4 percent) and 429 (10 percent) respectively. Leading causes of injury in Fire Suppression are strains and sprains, followed by burns and exposures. The leading causes of injury in EMS are strains and sprains, followed by exposures to airborne, chemical and blood pathogens.

In 2012, the commission moved EMS from Rescue Non-Fire (swift water, confined space, trench, extrication and other rescues) into its own category in order to better track these incidents and injuries. In August 2012 the commission also began collecting more information about the tasks that the individuals were performing when the injuries occurred.

Mission

The commission shall gather and evaluate data on fire protection personnel injuries and develop recommendations for reducing injuries.

The commission supports the continuation of the agency's educational and outreach programs. These programs are designed to provide information on the various educational resources available through TCFP's Ernest A. Emerson Fire Protection Resource Library; associated references linked to this subject; TCFP staff clearinghouse and outreach programs such as the "Avoid Injury!" blog and newsletters; and the adoption of the "Courage to be Safe" program.

Building a Community of Safety

The goal of the Texas Commission on Fire Protection's Injury Reporting program is to help the fire service community identify common injuries and learn how to avoid risk and prevent injuries.

Why we are collecting injury data

Under Texas Government Code §419.048, the Texas Legislature charged the commission with gathering and evaluating data on injuries and assisting the fire service in increasing safety. The rules requiring regulated entities to report injuries to the commission are in Texas Administrative Code §435.23. The commission also strongly encourages volunteer entities to report injuries so that we gain as accurate a picture as possible concerning injury trends in the Texas fire service. The injury reporting program began in March 2010.

What information do we collect?

- Minor, serious, critical and fatal injuries
- Activities where fire personnel are injured
- Types of injuries (burns, strain-sprains, wounds, etc.)
- Body parts being injured
- What task firefighter was doing at time of injury
- Missed time

- Work assignment after injury
- Malfunctions/failures of PPE, SCBA, PASS devices and SOPs

How this will help you

- Identify common injuries
- Identify trends in injuries
- Identify needed training
- Evaluate and find improvements in procedures
- Track lost time injuries (requested by user community)

Learn more and get help

Information from reported injuries is being provided to the fire service community via our website, our "Avoid Injury!" blog, our Facebook page and the year-end report to the State Fire Marshal's Office. (A link to the 2011 year-end report was also published in the *Texas Daily Dispatch*.)

Reports, Information and Data Collection

This report contains data submitted by regulated and non-regulated entities. The data collected in 2012 was the second full year of reporting. We anticipate it will take five years of reporting to provide more substantive and accurate data for trending and analysis. Of the approximately 619 regulated and voluntarily reporting departments, 89 percent reported injuries or a report of no injury, and 11 percent of regulated entities did not respond.

We continually reach out to all the entities to communicate the need to report, the types of information needed, and how to respond to requests for information and investigations. Commission staff members attended and presented at Texas Fire Chiefs Association regional meetings, local chiefs' meetings, Southwest Fire Rescue, and State Firemen's and Fire Marshals' Association conferences to communicate information we have gathered from injury reporting, to stress the need for participation, and to remind them of the statutory requirement to report.

The commission's "Avoid Injury!" blog provides information on current statistics, as well as information about resources available through the Ernest A. Emerson Fire Protection Resource Library. Statistics are updated semi-monthly on a rolling calendar cycle. New blog posts are being provided by the fire service on the "Courage to be Safe" program's "16 Life Safety Initiatives" and how the initiatives have impacted their departments or the fire service. This information is also posted on the commission's Facebook page.

Throughout the year we received feedback from stakeholders on challenges they have experienced and changes they would like to see. The agency hosted a face-to-face meeting with its user community to gather additional data. Eight individuals from across the state participated, and the information we received was invaluable.

In order to gather information regarding what ***tasks*** fire personnel were completing when they were injured, changes were needed from the reporting entities in the narrative portion of the report. This format was provided by the user group:

When you enter text into the incident description field, please provide answers to the following questions:

- *What specific action was the individual performing at the time of the injury (e.g., lifting, walking, advancing hose, pulling ceiling)?*
- *What PPE was the individual wearing or using at the time of the injury (e.g., bunker gear, gloves, back belt, SCBA)?*
- *What body part was injured (e.g., back, neck, shoulder)?*
- *If known, what were the causes or contributing factors leading to this injury (e.g., improper use of PPE, poor fitting PPE, poor lifting technique, environment too hot, flash over)? This will help us determine what areas may need more training for the fire service as a whole.*
- *What was the FF exposed to (if known)?*

Additionally, a monthly "No Injury" report function was added to the system. This helps the staff in the following areas:

- The commission must show the legislature that the fire service is complying with the law.
- The monthly reports help track how many entities are reporting.
- Entities that are not having injuries could help us understand what they are doing to prevent them.

Fire Personnel Injuries 2012

The numbers reflect reported injuries for January 1, 2012 to December 31, 2012. We are also comparing the Texas numbers with the NFPA's ***U.S. Firefighter Injuries - 2011*** report issued in October 2012.

The number of reported injuries in 2012 was 4,264.

Chart 1
Injury by Activity and Severity

Activity	Minor	Serious	Critical	Fatal	Grand Total
Fire Prevention	45	18			63
Fire Suppression	654	231	3	1	889
Hazmat	24				24
Rescue - Fire Related	14	7			21
Rescue - Non Fire	147	34	1		182
EMS	1042	196	4		1242
Responding to Incident	90	43			133
Returning from Incident	30	24			54
Skills Training	367	113	5	1	486
Station Duties	508	233			741
Wellness/Fitness	294	134	1		429
Grand Total	3215	1033	14	2	4264

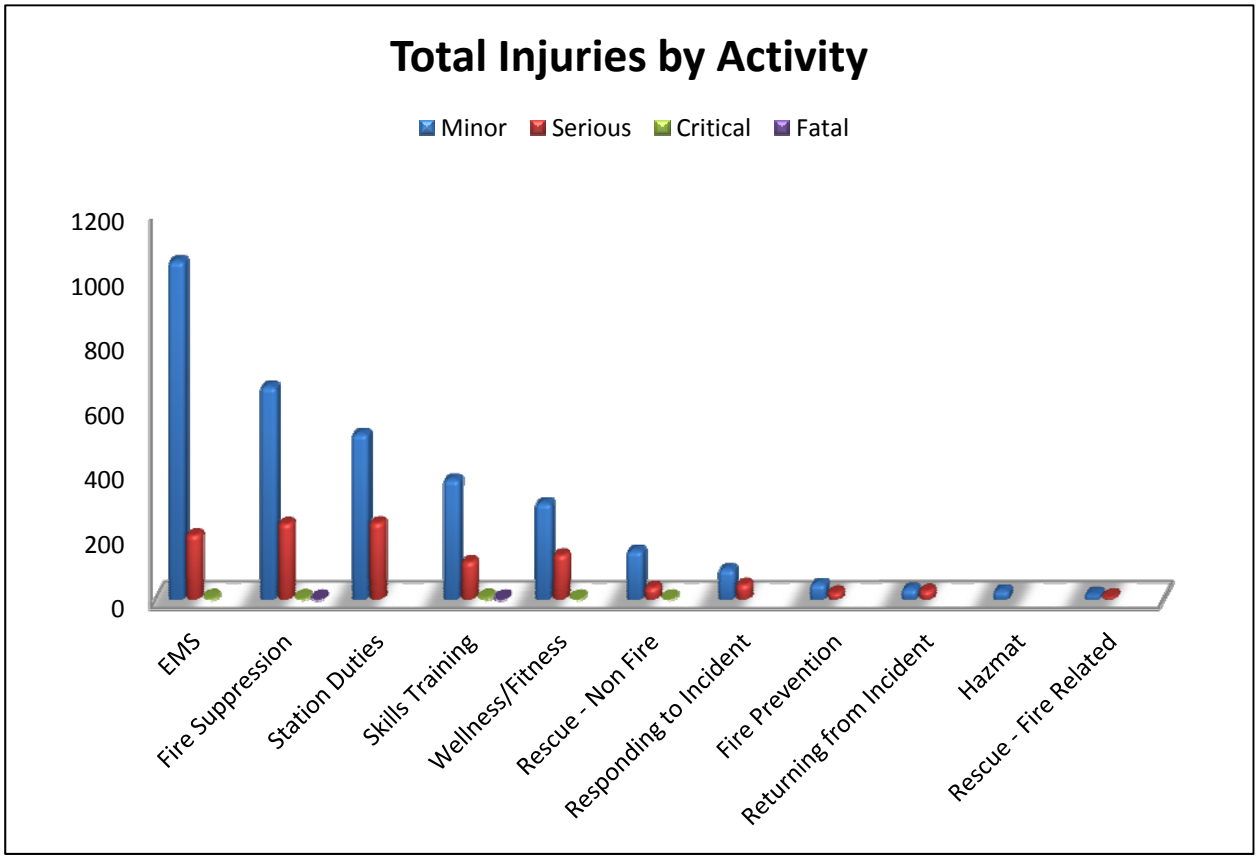
Minor injuries are injuries that result in the firefighter missing less than one full duty period.

Serious injuries are those that require the firefighter to miss more than one full duty period.

Critical injuries are those that require the firefighter to miss more than one full duty period and is hospitalized.

The Total Injuries by Activity graph shows the overall severity of injuries incurred in 2012. There were a total of 3,215 minor injuries, 1,033 serious, 14 critical and two fatalities.

Figure 1



Injuries by Type

The injury by type chart shows the overall categories of the types of injuries incurred during 2012.

Chart 2
Type of injury

Injury by Type	Number of Injuries
Stroke	1
Exposure-Chemical-CO	1
Heart Attack	2
Fracture Spine-Neck	4
Hearing Loss - Chronic	7
Electrocution	11
Hearing Loss - Acute	18
Smoke-Gas Inhalation	22
Exposure-Undetermined	23
Chest Pains-Cardiac	40
Broken Bones	46
Pain Medical Unspecified	49
Debris/Penetrating	51
Bites-Stings	93
Exposure - body fluids	124
Exposure-Chemical	128
Environmental	133
Exposure Blood Pathogens	160
Burns	176
Exposure Airborne Pathogens	404
Wound	631
Strain-Sprain	2140
Grand Total	**4264**

Task at time of injury

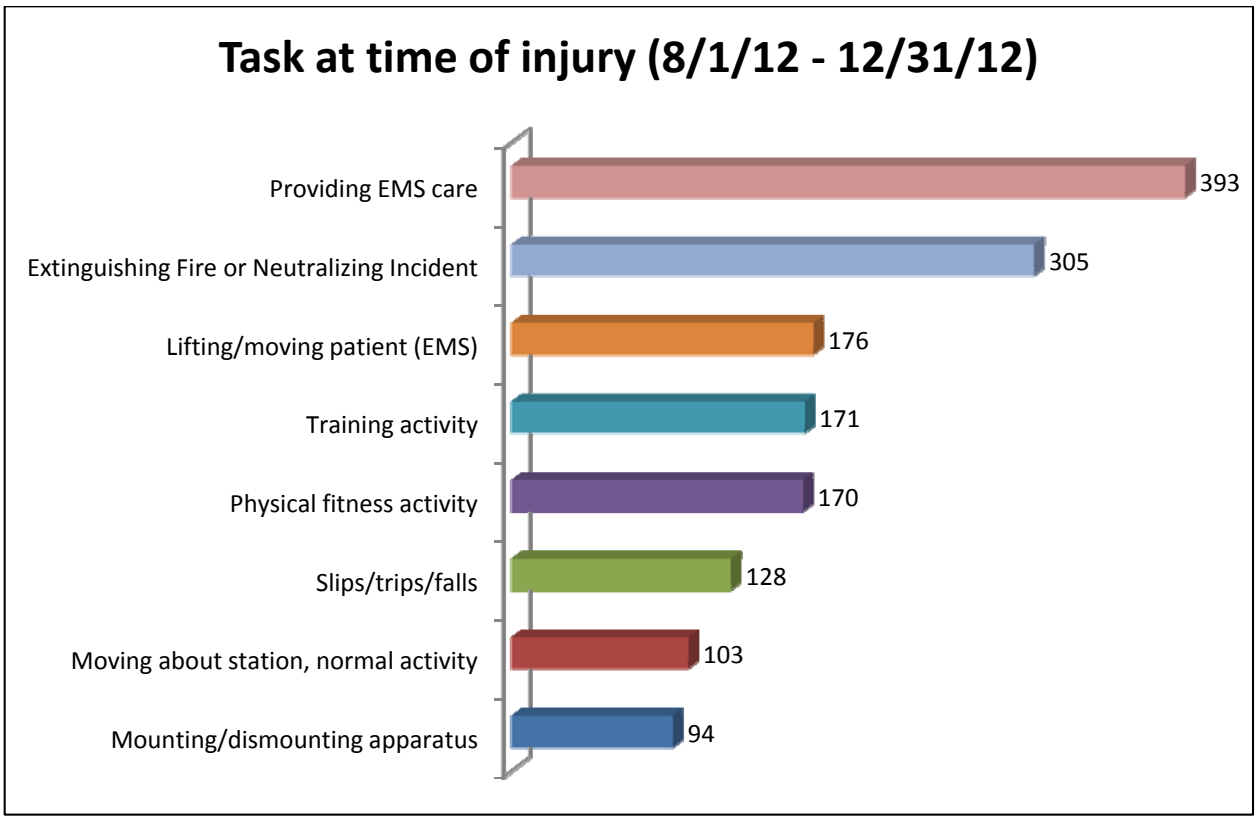
Collection of how fire personnel are getting injured was requested in 2012 during a user group discussion. The information was previously being collected in the narrative, but there was no place to capture this for reporting purposes until August 2012. This information reflects five months of data collection. It is a representative sample of the injuries occurring. (The "uncategorized" number includes injuries reported prior to implementation of the new data gathering processes.)

Chart 3
Injury Categories

Injury Categories	Number Injured
Carrying/dragging a person (rescue)	1
Operating in low/no visibility	1
Moving about station, alarm sounding	2
Operating power tool	2
Salvage	2
Inspection Activity	3
Manually moving item to gain access	3
Operating Fire Department Apparatus	3
Operating nozzle	3
Crawling in a confined or otherwise hazardous area	5
Raising/lowering ladder	6
Ascending/descending stairs	8
Ascending/descending ladder	9
Incident Investigation	9
Forcible Entry	10
Non-Fire Incidents	12
Administrative Work	13
Vehicle Maintenance	13
Responding to/returning from incident	20
Operating manual tool	27
Overhaul	28
Deploying and extending hose line	29
Removing equipment from/returning equipment to apparatus	31
Driving/riding in a vehicle	36
Equipment Maintenance	37
Rescue, other	37
Moving/picking up tools or equipment	40
Station Maintenance	47
Other: Description	54
Mounting/dismounting apparatus	94
Moving about station, normal activity	103
Slips/trips/falls	128
Physical fitness activity	170
Training activity	171
Lifting/moving patient (EMS)	176
Extinguishing Fire or Neutralizing Incident	305
Providing EMS care	393
Uncategorized	2233
Grand Total	**4264**

Figure 2 reflects the top eight identified categories of tasks being performed at time of injury.

Figure 2



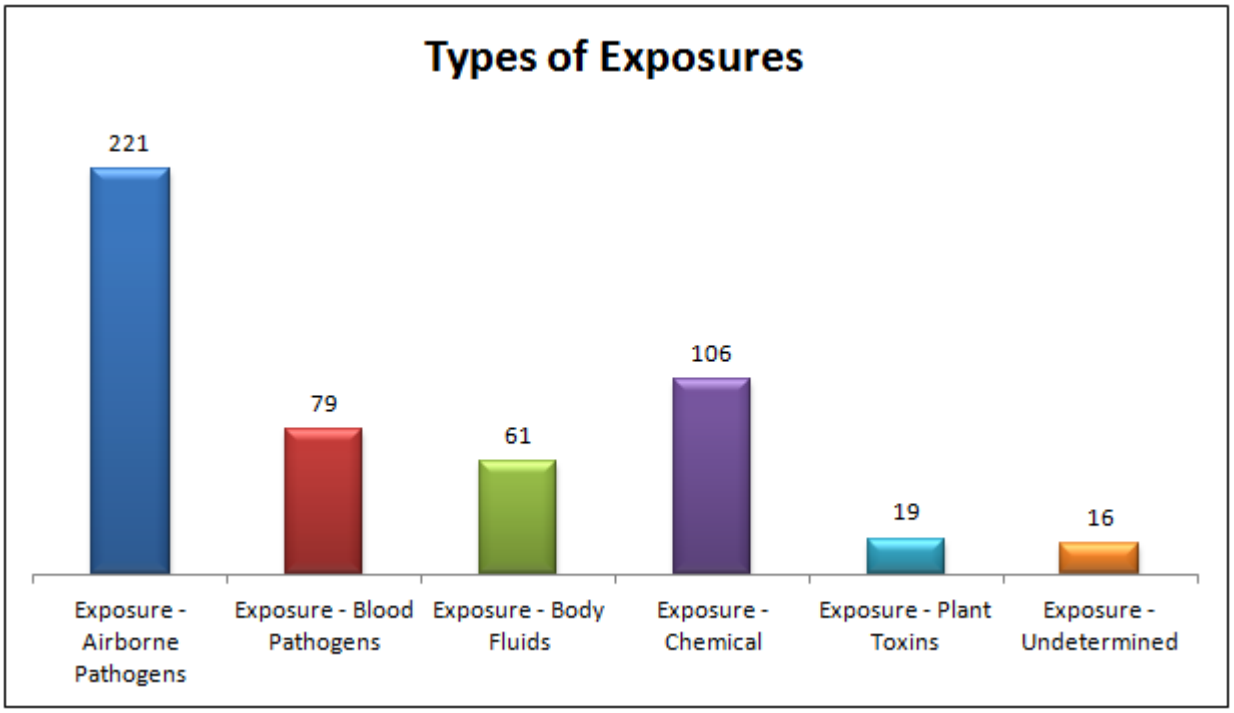
Exposures

Exposures are a large number of reported injuries. The majority have not resulted in immediate reactions or lost time to these individuals. The top three categories are airborne pathogens, chemical and blood pathogens. Figure 3 reflects the information in graph form.

Chart 4
Types of Exposures

Types of Exposures	Totals
Exposure - Airborne Pathogens	221
Airborne, Other	40
Asbestos	11
Bacterial Pneumonia (lungs)	1
Body fluids	2
Chemicals/household/industrial	1
Chlorine	1
Meningitis	61
MRSA	5
Sickness, other	2
TB	97
Exposure - Blood Pathogens	79
Animals/Wildlife	1
Blood	68
Hep C	6
HIV	1
Lice	2
Staph	1
Exposure - Body Fluids	61
Body fluids	50
Vomit	11
Exposure - Chemical	106
Aluminum Phosphide (PH3)	3
Asbestos	58
Chemicals/household/industrial	45
Exposure - Plant Toxins	19
Poison Plants	19
Exposure - Undetermined	16
Chemicals/household/industrial	3
Scabies	4
Sickness, other	4
Unknown	5
Grand Total	**502**

Figure 3



Injuries by Employment Status

Chart 5
Employment Status

Employment Status	2012	2011	2010
Full Time	4046	4098	2565
Part Time	25	21	12
Student (i.e. college)	68	23	0
Trainee (i.e. fire dept)	40	0	10
*Volunteer	85	100	20
Grand Total	**4264**	**4242**	**2607**

*Volunteer injuries reported here represent only those who chose to report their injuries.

Injuries by Severity

In 2010, 78 percent of the injuries reported were minor; in 2011, 76 percent and in 2012, 75 percent. Serious injuries in 2010 were 20 percent, increased in 2011 to 23 percent and again in 2012 to 24 percent.

Chart 6
Totals by severity

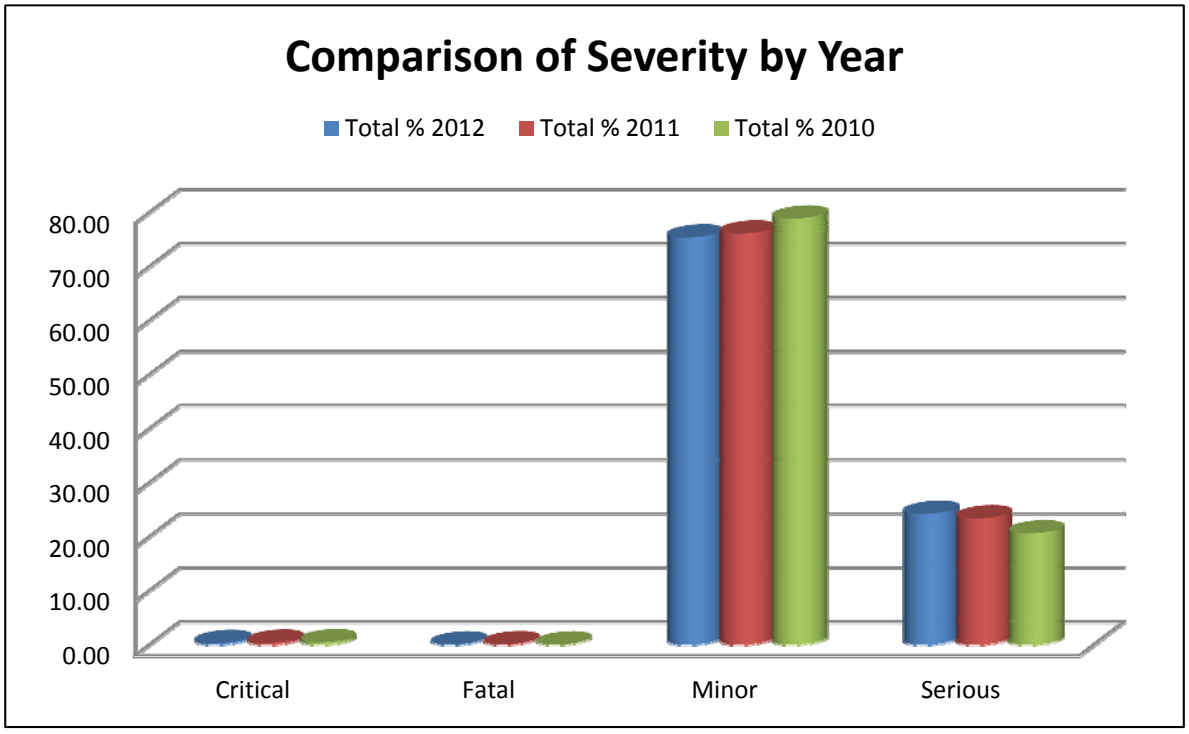
Severity	Total 2012	Total 2011	**Total 2010
Critical	14	16	11
Fatal	2	4	1
Minor	3215	3182	1897
Serious	1033	978	496
Grand Total	4264	4180	2405

The table below shows the percentage of injuries reported by severity for 2010, 2011 and 2012.
**2010 was a nine-month reporting year.

Chart 7
Percentage by severity

Severity %	Total % 2012	Total % 2011	Total % 2010
Critical	0.33	0.38	0.46
Fatal	0.05	0.10	0.04
Minor	75.40	76.12	78.88
Serious	24.23	23.40	20.62
Grand Total	100.00	100.00	100.00

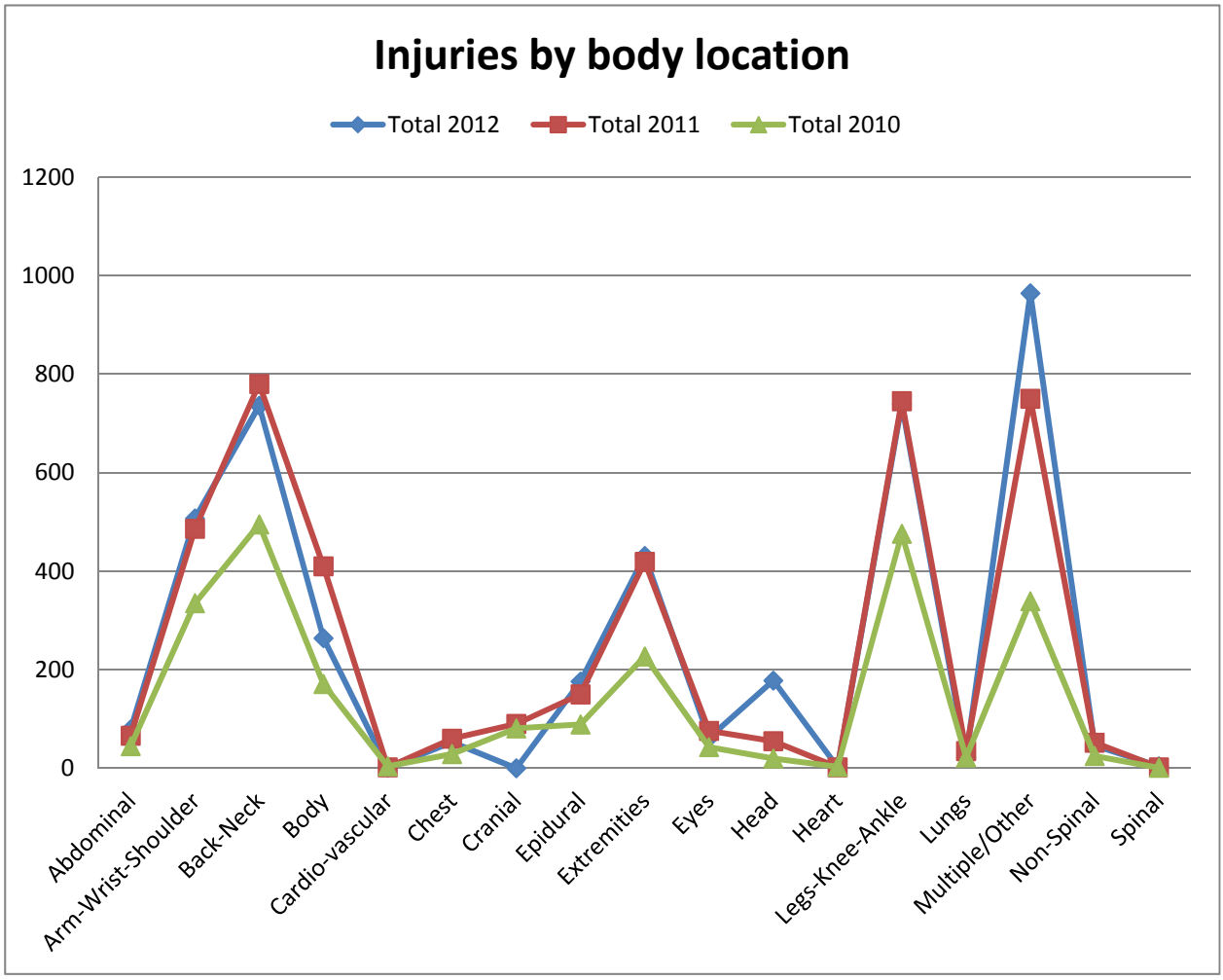
Figure 4



Injuries by Body Location

Trends in injury body locations remain consistent.

Figure 5



**2010 was a partial reporting year of nine months.

The next two figures show the number of injuries by specific body location. Multiple body parts and whole body injuries are mostly exposure reports.

Figure 6

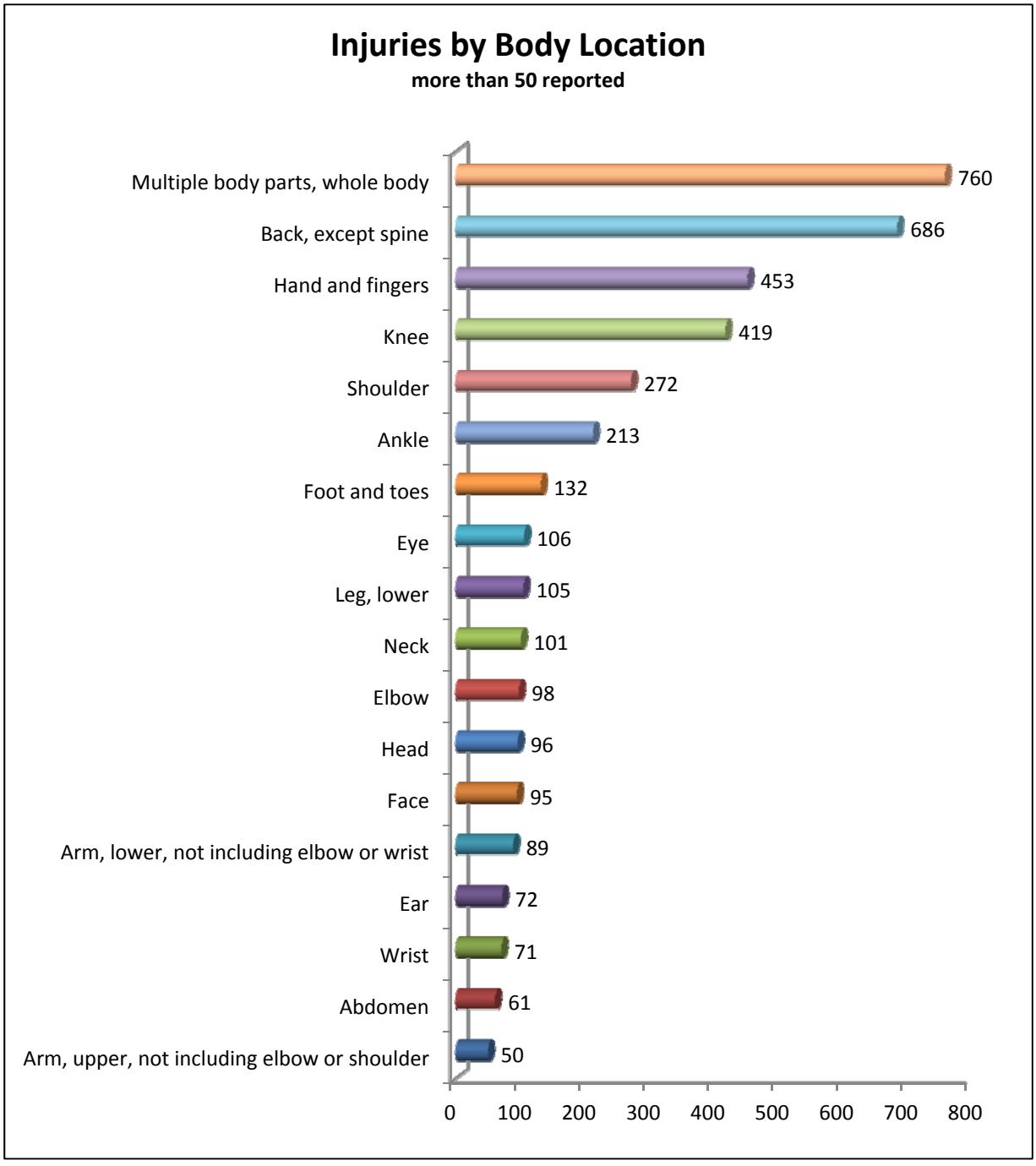
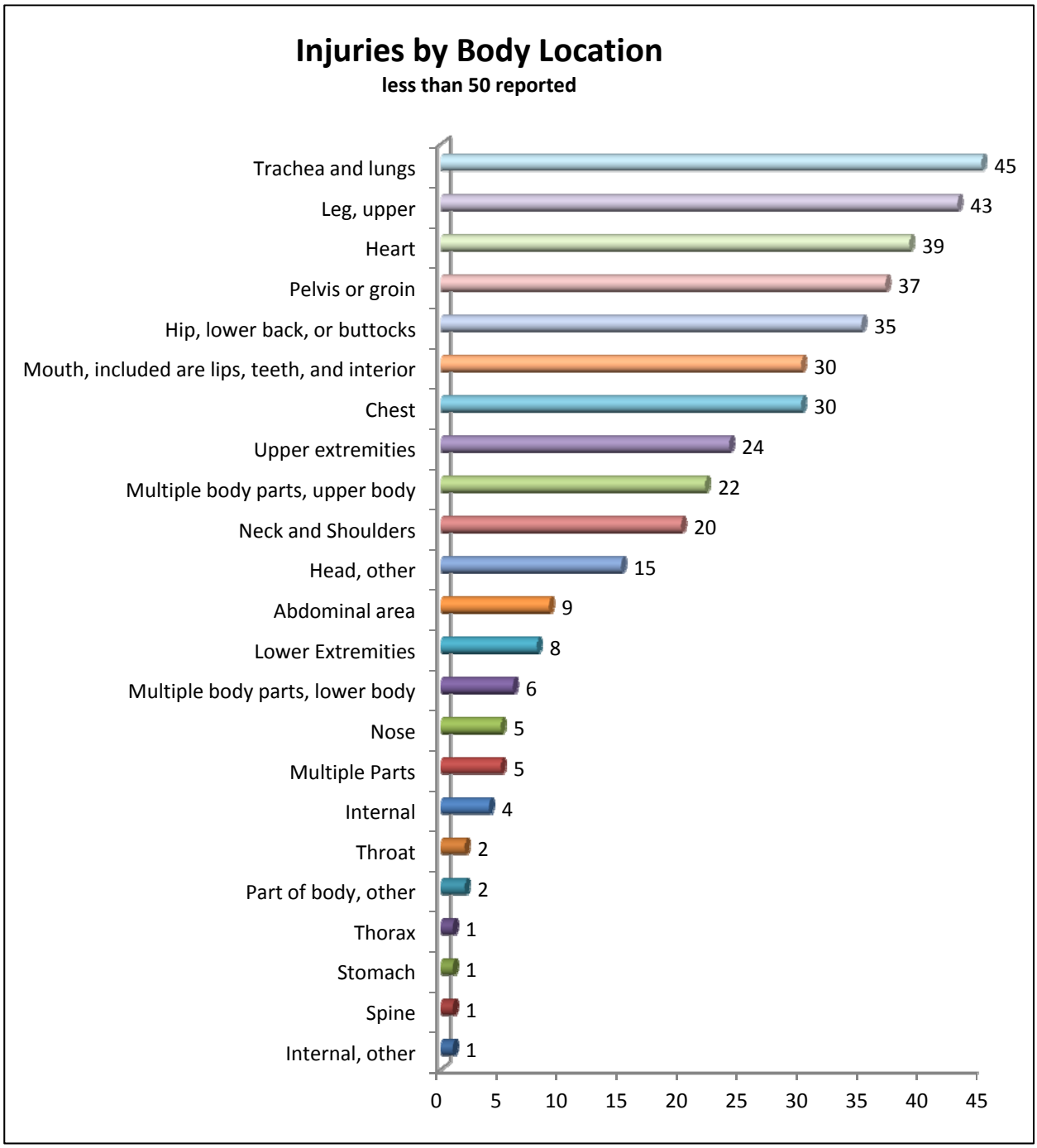


Figure 7


Injuries by Body Location
less than 50 reported
Trachea and lungs 45
Leg, upper 43
Heart 39
Pelvis or groin 37
Hip, lower back, or buttocks 35
Mouth, included are lips, teeth, and interior 30
Chest 30
Upper extremities 24
Multiple body parts, upper body 22
Neck and Shoulders 20
Head, other 15
Abdominal area 9
Lower Extremities 8
Multiple body parts, lower body 6
Nose 5
Multiple Parts 5
Internal 4
Throat 2
Part of body, other 2
Thorax 1
Stomach 1
Spine 1
Internal, other 1
0 5 10 15 20 25 30 35 40 45

Injuries by Activity

The trend shows injuries are occurring during the same activities with a similar degree of severity. There were a few changes in 2012 compared to 2011. Fire Suppression injuries were reduced in 2012, while Skills Training, Wellness/Fitness and Station duties increased slightly. Figures 8 and 9 reflect the numbers in graph form.

Chart 8
Injury by activity by percent

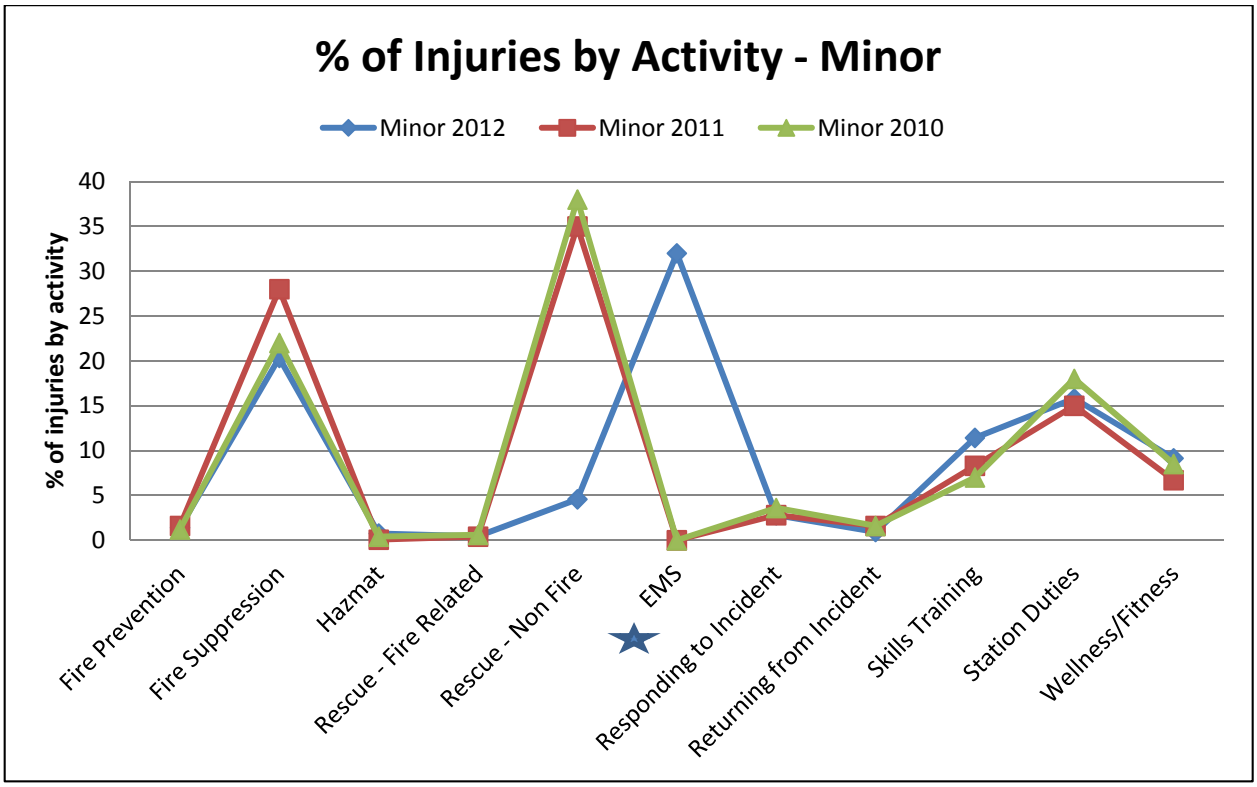
Activity by %	Minor 2012	Minor 2011	Minor 2010	Serious 2012	Serious 2011	Serious 2010
Fire Prevention	1.4	1.6	1.2	1.74	1.7	1.4
Fire Suppression	20.34	28	22	22.36	28	23
Hazmat	0.75	0.06	0.4	0.00	0	0.8
Rescue - Fire Related	0.44	0.4	0.6	0.68	0.4	0.4
Rescue - Non Fire	4.57	35	38	3.29	21	24
EMS	32	0	0	18.97	0	0
Responding to Incident	2.8	2.8	3.6	4.16	5.4	5.2
Returning from Incident	0.93	1.6	1.6	2.32	3	3.2
Skills Training	11.42	8.3	7	10.94	11	11
Station Duties	15.8	15	18	22.56	20	19
Wellness/Fitness	9.14	6.7	8.5	12.97	10	11.7
Grand Total	3215	3182	1897	1033	978	496

Chart 9
Injury by activity by number

Activity	Minor 2012	Minor 2011	Minor 2010	Serious 2012	Serious 2011	Serious 2010
Fire Prevention	45	51	22	18	17	7
Fire Suppression	654	900	412	231	270	115
Hazmat	24	2	7	0	0	4
Rescue - Fire Related	14	14	11	7	4	2
Rescue - Non Fire	147	1113	716	34	208	119
EMS	1042	0	0	196	0	0
Responding to Incident	90	92	68	43	53	26
Returning from Incident	30	50	30	24	28	16
Skills Training	367	263	135	113	104	55
Station Duties	508	485	335	233	193	94
Wellness/Fitness	294	212	161	134	101	58
Grand Total	3215	3182	1897	1033	978	496

**2010 was a partial reporting year of nine months.

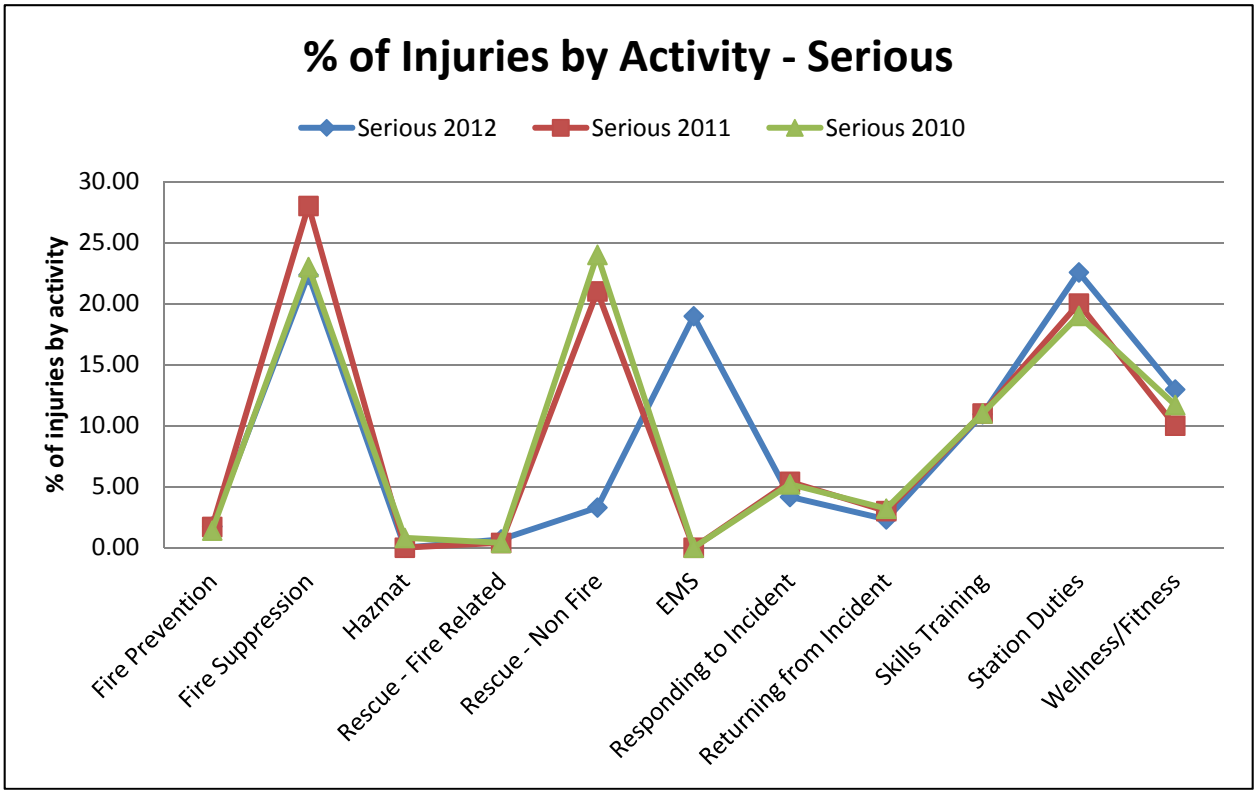
Figure 8



*EMS injuries were separated from the Rescue Non-Fire Category in 2012.

**2010 was a partial reporting year of nine months.

Figure 9



*EMS injuries were separated from the Rescue Non-Fire Category in 2012.

**2010 was a partial reporting year of nine months.

Injuries by Age Group

The average age of the injury reporting population is 37. Figure 10 reflects a 10 year spread in age while Figure 11 reflects five year spread in age.

Chart 10
Injury by age group

	12 months		12 months		9 months	
Age Groups	2012	2012	2011	2011	2010	2010
18-19	27	0.63%	12	0.29%	4	0.17%
20-29	821	19.25%	833	19.93%	495	20.58%
30-39	1746	40.95%	1648	39.43%	956	39.75%
40-49	1056	24.77%	1056	25.26%	580	24.12%
50-59	566	13.27%	597	14.28%	361	15.01%
60-69	47	1.10%	34	0.81%	9	0.37%
70+	1	0.02%	0	0.00%	0	0.00%
	4264		4180		2405	

Figure 10

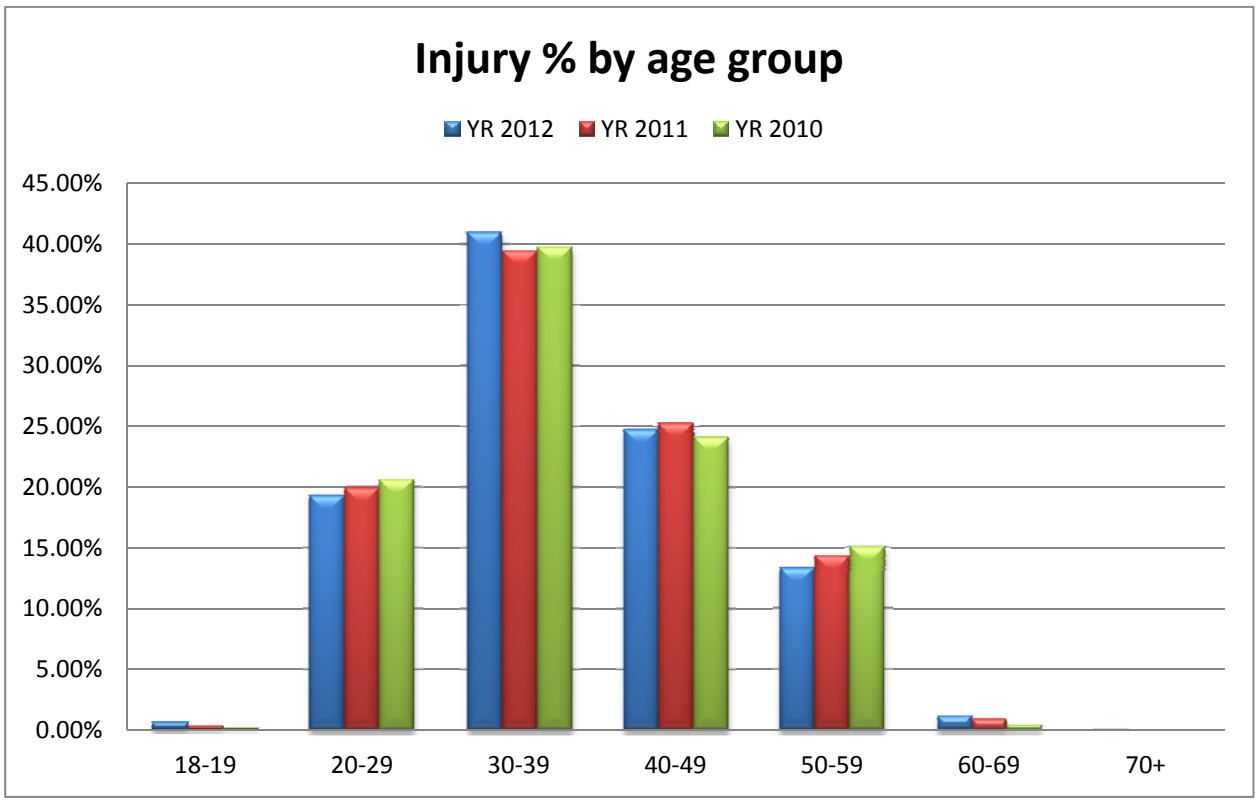
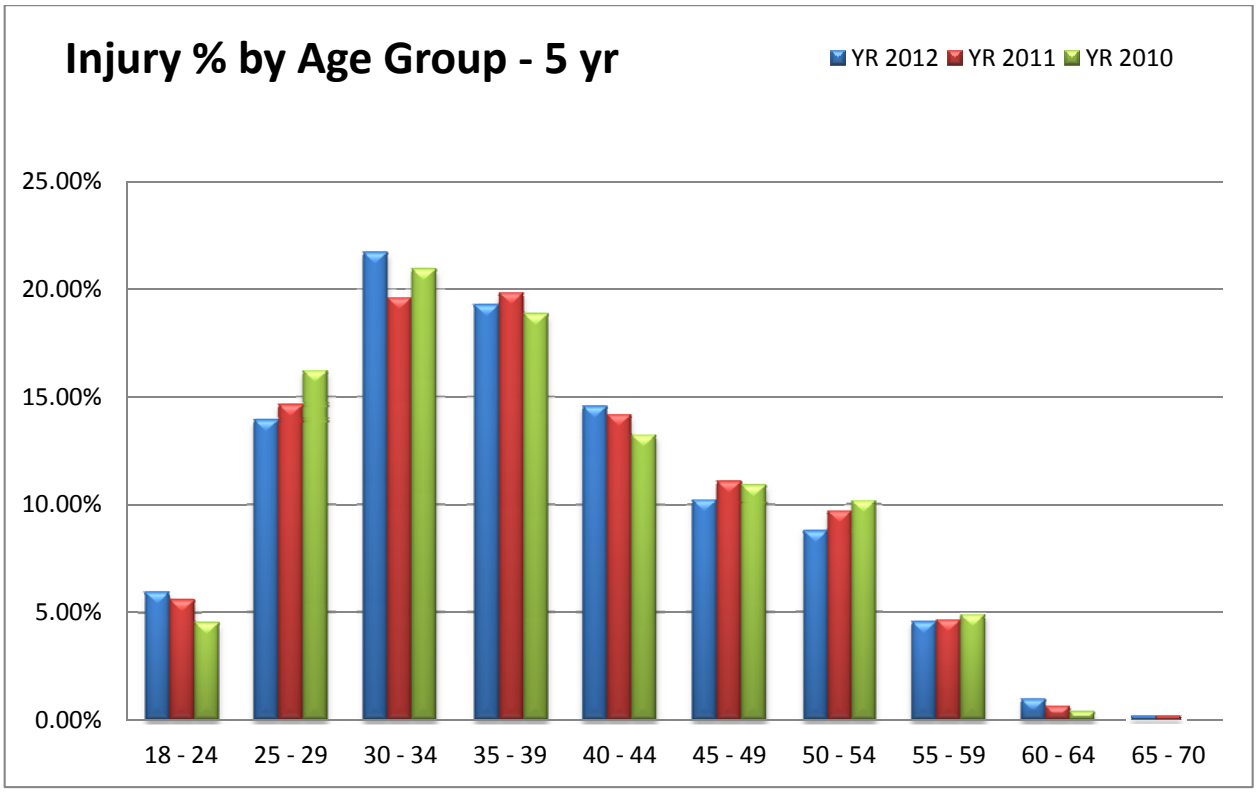


Figure 11


Injury % by Age Group - 5 yr
YR 2012
YR 2011
YR 2010
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
18 - 24
25 - 29
30 - 34
35 - 39
40 - 44
45 - 49
50 - 54
55 - 59
60 - 64
65 - 70

Injuries – With Lost Time

Of the 4,264 injuries reported in 2012, 24.81 percent of the injuries resulted in missed days. In 2012, 18 percent of injuries resulted in missed days. The commission defines missed work as "lost time" when an individual misses more than one full duty period as a direct result of an injury and does not return to the duties to which they were assigned prior to the injury.

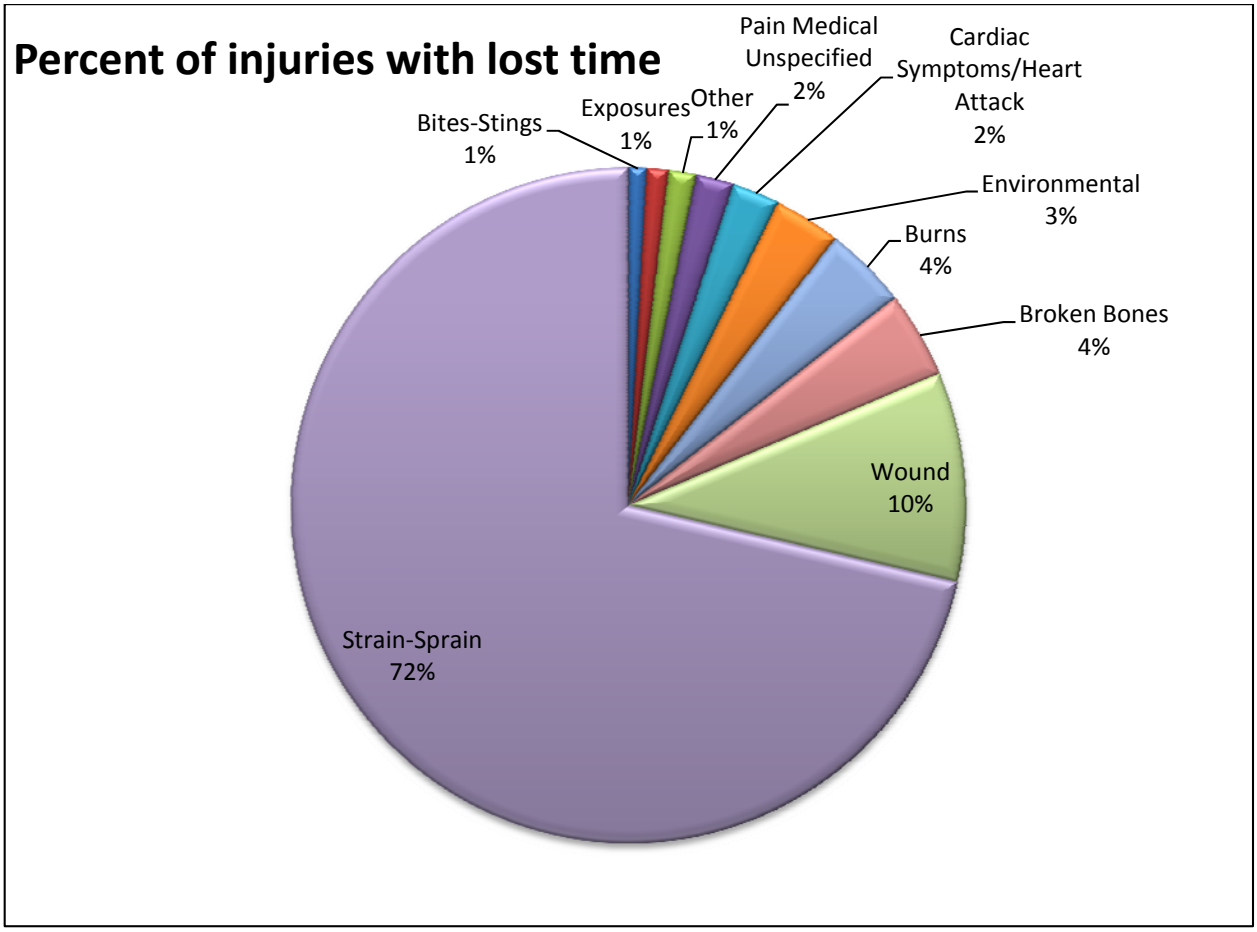
Example: an individual who sustained an injury returns to work on their normally assigned duty period, but the department temporarily assigns the individual to modified or light duty temporarily, rather than to their normal, pre-injury duty. This person has sustained a lost time injury.

Chart 11
Lost time types of injuries

Type of Injury	# of injuries with lost time
Bites-Stings	9
Broken Bones	41
Fracture Spine-Neck	3
Burns	42
Chest Pains-Cardiac	22
Debris/Penetrating	4
Electrocution	4
Environmental	34
Exposure Airborne Pathogen	5
Exposure Blood Pathogens	2
Exposure-Chemical	3
Exposure-Undetermined	1
Hearing Loss - Acute	1
Heart Attack	2
Pain Medical Unspecified	19
Smoke-Gas Inhalation	5
Strain-Sprain	755
Wound	106
Grand Total	**1058**

Strain-Sprain injuries were up six percent in 2012 (from 66 percent). Wounds were down two percent and burns and broken bones remain the same at four percent.

Figure 12



Injury	Average # of days missed (1-30)	Average # of days missed (31-90)	Average # of days missed (91+)
Broken Bones	17.11	63.27	161
Strain-Sprain	11.17	53.71	204
Wound	9.195	48.28	219

Injuries – Lost Time

Chart 12
By Activity – between 1 and 30 days

Activity	# of Injuries leading to 1-30 days missed	Average # of days missed (lost time)	Total days missed (lost time)
Fire Prevention	13	10.69	139
Fire Suppression	149	10.31	1536
Rescue - Fire Related	4	9.50	38
Rescue - Non Fire	24	13.58	326
EMS	127	10.89	1383
Responding to Incident	24	10.58	254
Returning from Incident	11	12.45	137
Skills Training	75	9.48	711
Station Duties	152	10.97	1667
Wellness/Fitness	68	10.25	697
Grand Total	647	10.65	6,888

Chart 13
By Activity – between 31 and 90 days

Activity	# of Injuries leading to 31-90 days missed	Average # of days missed (lost time)	Total days missed (lost time)
Fire Prevention	3	37.33	112
Fire Suppression	45	54.49	2452
Rescue - Fire Related	2	40.50	81
Rescue - Non Fire	11	46.82	515
EMS	42	52.50	2205
Responding to Incident	9	61.11	550
Returning from Incident	9	58.56	527
Skills Training	21	53.95	1133
Station Duties	45	56.07	2523
Wellness/Fitness	34	54.06	1838
Grand Total	221	54.01	11,936

Chart 14
By Activity – 91+ days

Activity	# of Injuries leading to 91+ days missed	Average # of days missed (lost time)	Total days missed (lost time)
Fire Prevention	1	257.00	257
Fire Suppression	42	204.62	8594
Rescue - Fire Related	1	451.00	451
Rescue - Non Fire	14	252.57	3536
EMS	24	216.17	5188
Responding to Incident	9	240.33	2163
Returning from Incident	5	253.40	1267
Skills Training	23	201.35	4631
Station Duties	47	181.98	8553
Wellness/Fitness	24	156.75	3762
Grand Total	190	202.12	38,402

Chart 15

Lost Time by Activity – combined chart of lost time from 1 day to 91+ days.

Activity	# of Injuries leading to 1-30 days missed	# of Injuries leading to 31-90 days missed	# of Injuries leading to 91+ days missed
Fire Prevention	13	3	1
Fire Suppression	149	45	42
Rescue - Fire Related	4	2	1
Rescue - Non Fire	24	11	14
EMS	127	42	24
Responding to Incident	24	9	9
Returning from Incident	11	9	5
Skills Training	75	21	23
Station Duties	152	45	47
Wellness/Fitness	68	34	24
Grand Total	647	221	190

Chart 16

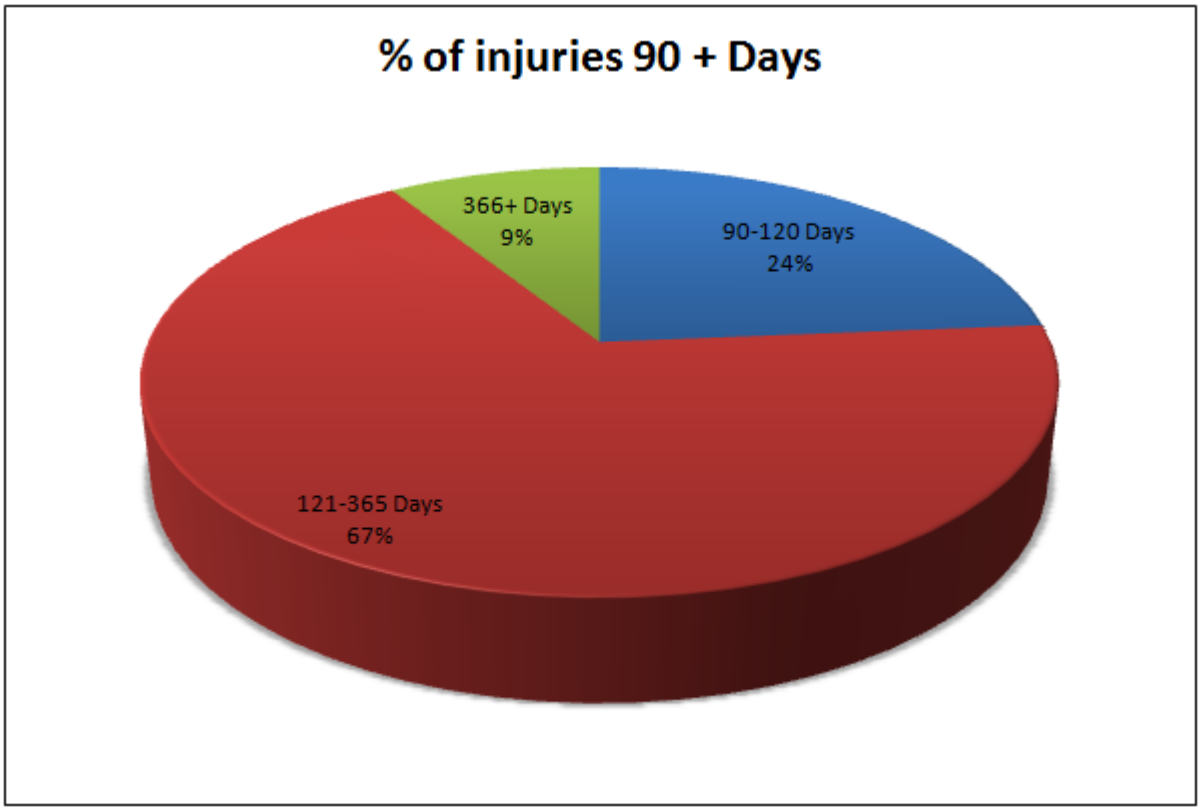
Average Lost Time by Activity – combined chart average lost time from 1 day to 91+ days.

Activity	Average # of days missed (1-30)	Average # of days missed (31-90)	Average # of days missed (91+)
Fire Prevention	10.69	37.33	**257.00**
Fire Suppression	10.31	54.49	204.62
Rescue - Fire Related	9.50	40.50	**451.00**
Rescue - Non Fire	**13.58**	46.82	252.57
EMS	10.89	52.50	216.17
Responding to Incident	10.58	**61.11**	240.33
Returning from Incident	**12.45**	**58.56**	**253.40**
Skills Training	9.48	53.95	201.35
Station Duties	**10.97**	**56.07**	181.98
Wellness/Fitness	10.25	54.06	156.75
Grand Total	10.65	54.01	202.12

The bold areas above reflect the three highest lost time injuries from each category.

Figure 13 reflects the percent of injuries occurring in the 90 + day category. 67% of the injuries are occurring in the 121-365 day time span.

Figure 13



Examples of narratives reported for lost time injuries

- Employee was at the scene of an MVA and was helping load a patient into the back of an ambulance. Employee had his left thumb caught in the hinge mechanism of stretcher and thumb was crushed.
- During fire became overheated.
- FF stated he strained his back while pulling fire hose.
- Employee strained back while opening hydrant.
- Firefighter tripped over charged attack line at a fire scene and injured his right knee.
- Firefighter was riding in the front passenger seat en-route to an emergency run when the apparatus was involved in an accident. He was wearing his seatbelt when the apparatus was struck approximately 5 feet behind where he was sitting causing him to hit his head on the window. He was in full bunker gear including his hood but not his SCBA nor his gloves.
- Firefighter dismounted fire engine after responding to an incident and twisted left knee.
- During training hooking hose to pump panel, coupling popped off striking right hand.
- The firefighter was training with the stair chair used for evacuation of incapacitated patients. While pulling the chair up with a fellow firefighter in the chair he pulled something in his back.
- The firefighter was participating in a skills assessment when he felt a pain in his lower back while attempting to drag a 175-pound dummy. The firefighter was in full PPE including breathing air from a SCBA during the event.
- Firefighter was performing hose maintenance when a coupling under tension released and struck him in the ankle.
- Firefighter was preparing food for dinner and cut the end of thumb.
- Firefighter reports at fire station during equipment check he strained left side of lower back when lowering/raising the stretcher from the rescue unit.
- Improper lifting of equipment causing sprain/strain to lower back.
- While stepping out of engine, firefighter missed bottom step of truck.
- Firefighter reported felt sharp pain in back and leg after weight lifting.
- Firefighter pulled hamstring while playing basketball.

Burns and PPE

The majority of the burn injuries reported in 2012 were to the hands, ears, neck, face and wrist. Based on the information gathered, the gear appeared to perform as designed and may have prevented more serious injuries from occurring. We did not see any trends or patterns indicating problems with any particular brand or manufacturer. Specific information on gear manufacturer, etc., was not collected on burns where the individual was not wearing the provided PPE/SCBA.

Chart 17
Burns by lost time

Injury Type	Avg.1-30 days missed (lost time)	Avg. 31-90 days missed (lost time)	Avg. 91+ days missed (lost time)
Burns	12.78	37.6	0

Figure 14 reflects in descending order the number of injuries by specific body part.

Figure 14

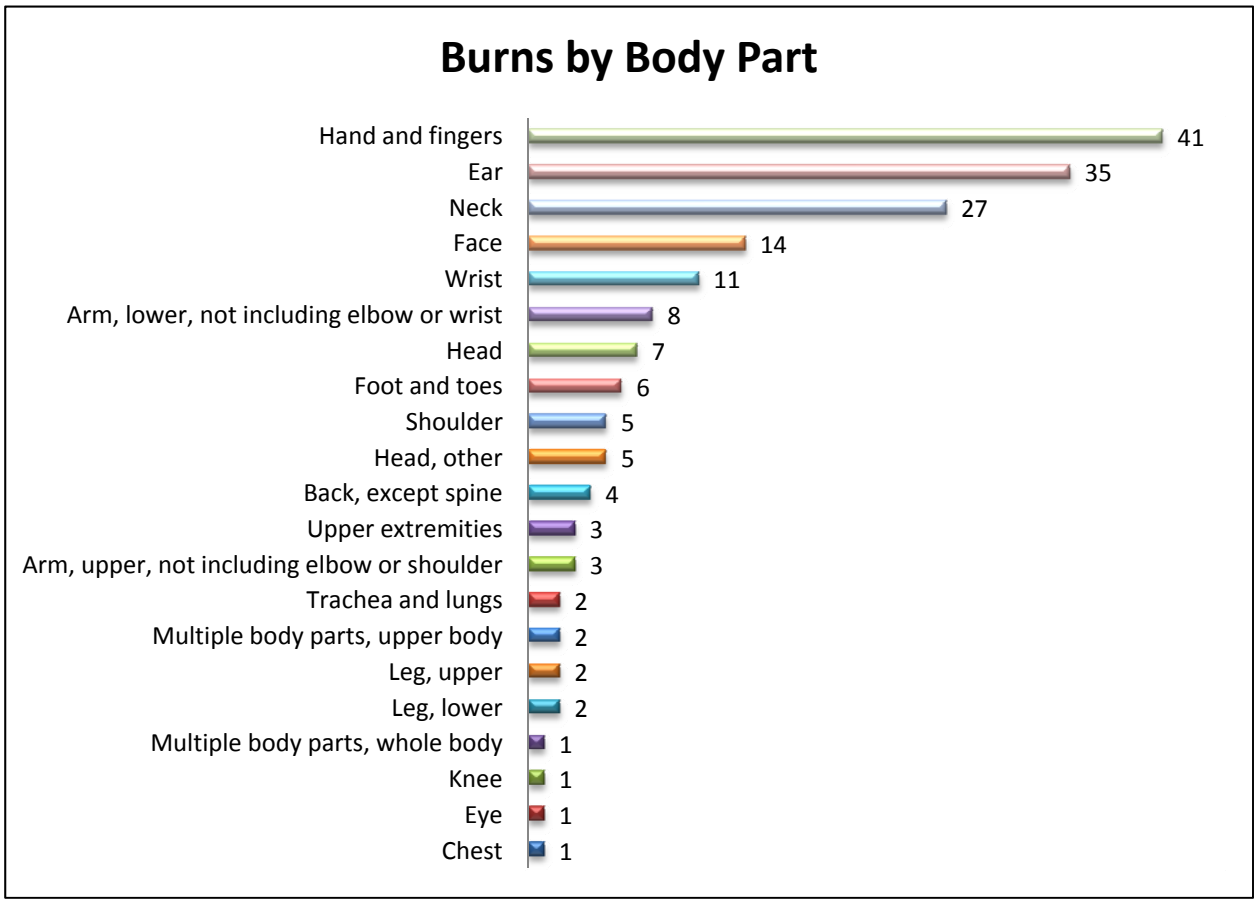


Figure 15

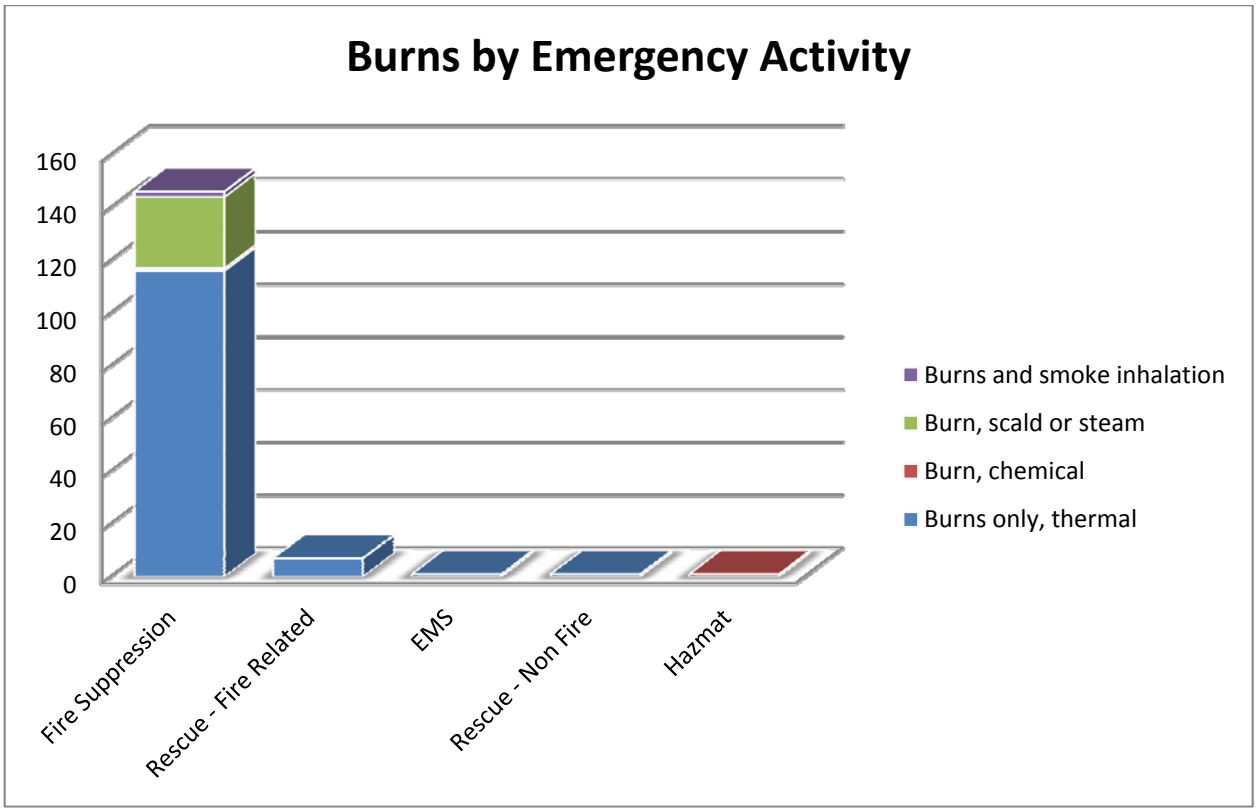


Figure 16

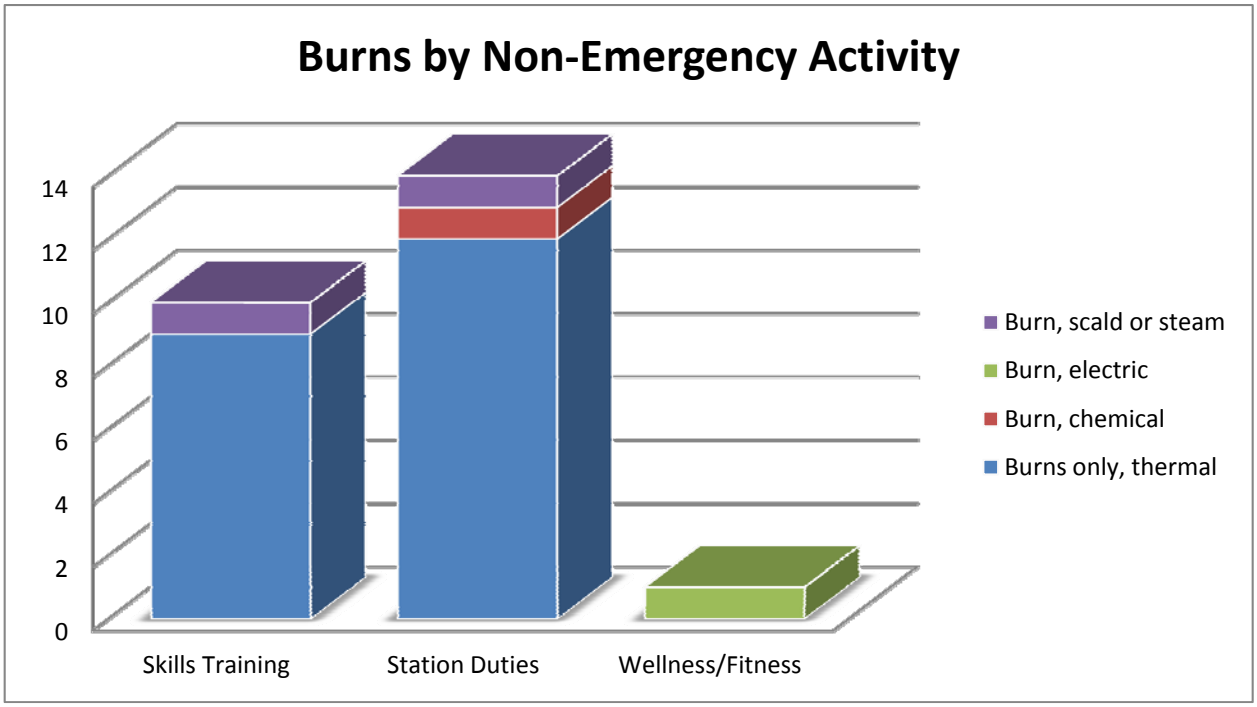


Chart 18
Burns by type

Burn by Type and Body Location	Total
Burn, chemical	**3**
Arm, lower, not including elbow or wrist	1
Hand and fingers	1
Wrist	1
Burn, electric	**1**
Hand and fingers	1
Burn, scald or steam	**29**
Arm, lower, not including elbow or wrist	1
Back, except spine	1
Ear	9
Face	3
Hand and fingers	2
Head	1
Head, other	1
Neck	6
Shoulder	2
Upper extremities	1
Wrist	2
Burns and smoke inhalation	**2**
Trachea and lungs	2
Burns only, thermal	**146**
Arm, lower, not including elbow or wrist	6
Arm, upper, not including elbow or shoulder	3
Back, except spine	3
Chest	1
Ear	26
Eye	1
Face	11
Foot and toes	6
Hand and fingers	37
Head	6
Head, other	4
Knee	1
Leg, lower	2
Leg, upper	2
Multiple body parts, upper body	2
Multiple body parts, whole body	1
Neck	21
Shoulder	3
Upper extremities	2
Wrist	8
Grand Total	**181**

SOP Issues

There were 19 injuries resulting from fire protection personnel failing to follow their departments' Standard Operating Procedures (SOPs) reported in 2012. All but a few were instances where the individuals were not wearing their provided PPE/SCBA gear in an environment or situation in which they should have been. The departments are reviewing their SOPs to make sure they are up to date, and are completing additional training to make sure these issues do not occur again.

In these situations, the Texas Commission on Fire Protection verifies with the department that the SOPs are in place and that they cover the appropriate subject matter. The commission does not become involved in any internal disciplinary actions surrounding these issues, as this is not within the commission's scope of authority. However, the commission stands ready to partner with the fire service by providing assistance, expertise and educational resources to promote a safer community.

Fatalities

Two fatalities were reported to the Texas Commission on Fire Protection in 2012.

The State Fire Marshal's office compiles all the LODD reports for the state. Full reports can be viewed at the State Fire Marshal's Office at http://www.tdi.texas.gov/reports/fire/documents/fmloddannul12.pdf

Comparison between the State of Texas (2012) and National Fire Protection Association (NFPA), *U.S. Firefighter Injuries - 2011*

We compared our numbers with NFPA's annual report from 2011, which was issued in October 2012. (NFPA numbers include injuries reported from Texas, so there is some overlap.)

Chart 19 and Figure 17 compares the State of Texas' reported injuries and the NFPA's report. The number of non-fire emergencies for the State of Texas is a much larger percentage compared with national numbers. According to the NFPA's report, the number of non-fire emergencies has increased significantly, but they are not seeing the number of injuries increasing (see report page 5 in 2009, 2010 and 2011).

> *For the same period, the number of non-fire emergencies increased a substantial 274%, due in large part to an increase in the number of medical aid incidents. When the injury rate per 1000 non-fire emergencies is examined, the rate has declined during the period from 1.24 in 1981 to 0.50 in 2011 (Figure 3), because the number of non-fire emergencies increased at a higher rate than the number on injuries at non-fire emergencies.*
>
> - NFPA, *U.S. Firefighter Injuries - 2011*

In Texas, the number of non-fire emergencies and the resultant number of injuries, specifically around EMS calls, is significant.

Texas Commission on Fire Protection categories:

- Fireground includes Fire Suppression and Rescue – Fire Related.
- Non-Fire includes Rescue Non-Fire, EMS and Hazmat.
- Other On-Duty includes Fire Prevention, Station Duties and Wellness/Fitness.

Chart 19
Comparison of Texas and NFPA

Activity	State of Texas 2012		National 2011	
Responding/Returning	187	4.39%	3870	5.52%
Fireground	910	21.34%	30505	43.52%
Non-fire Emergency	1448	33.96%	14905	21.27%
Training	486	11.40%	7515	10.72%
Other On-duty	1233	28.92%	13295	18.97%
	4,264		**70,090**	

Figure 17

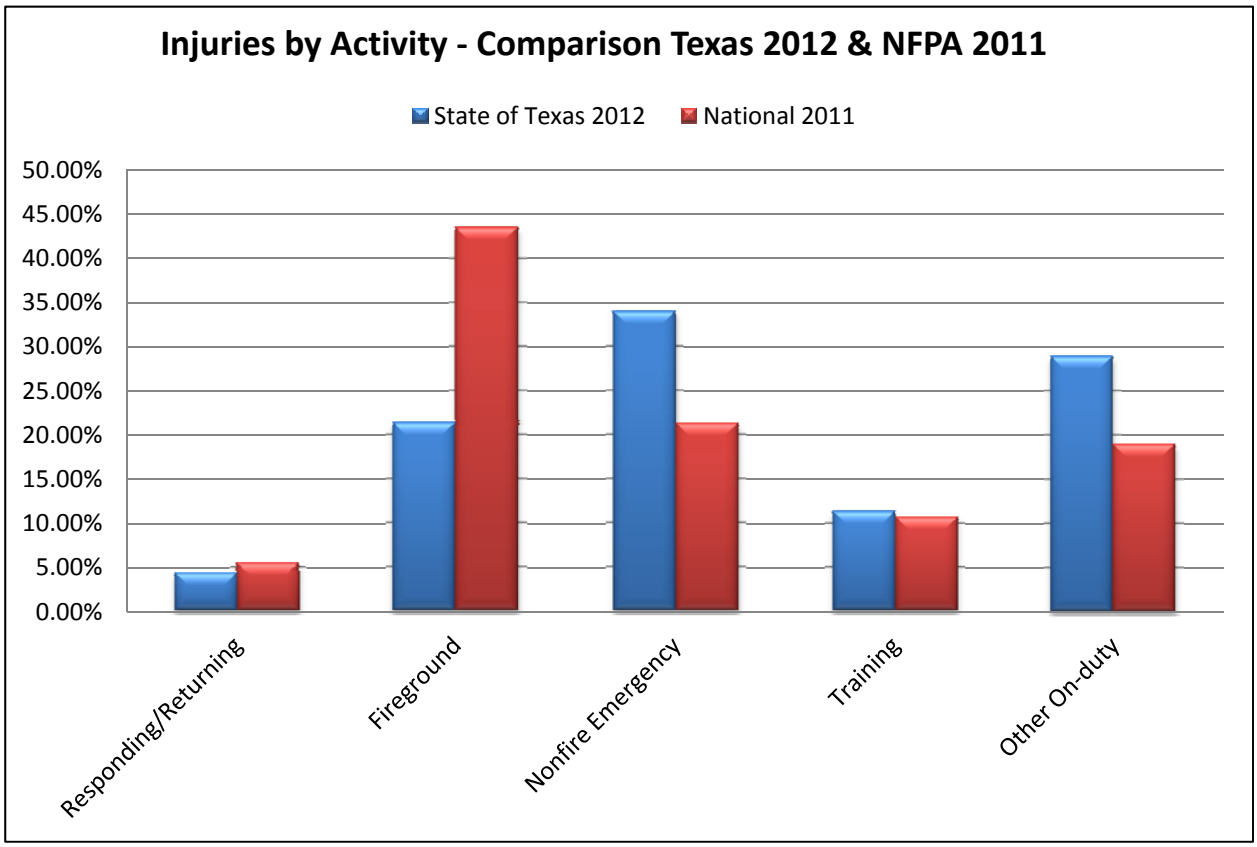


Chart 20
Responding and Returning from incidents

Report 2012	Respond/Return TX 2011		Respond/Return NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	0	0.000%	30	0.78%
Smoke-Gas Inhalation	0	0.000%	80	2.07%
Other Respiratory Distress	0	0.000%	50	1.29%
Burns & Smoke Inhalation (no)	0	0.000%	5	0.13%
Wound, cut, bleeding, bruise	38	20.321%	515	13.31%
Dislocation, fracture	2	1.070%	145	3.75%
Heart Attack or Stroke	5	2.674%	30	0.78%
Strain, sprain, muscular pain	135	72.193%	2485	64.21%
Thermal stress (frostbite, heat exhaustion)	1	0.535%	140	3.62%
Other	4	2.139%	390	10.08%
Exposures	2	1.070%		
Totals	187	100.00%	3870	100.00%

Chart 21
Fireground incidents

Report 2012	Fireground TX 2011		Fireground NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	158	17.363%	1905	6.24%
Smoke-Gas Inhalation	20	2.198%	1430	4.69%
Other Respiratory Distress	0	0.000%	595	1.95%
Burns & Smoke Inhalation (no)	0	0.000%	605	1.98%
Wound, cut, bleeding, bruise	148	16.264%	4435	14.54%
Dislocation, fracture	8	0.879%	735	2.41%
Heart Attack or Stroke	5	0.549%	255	0.84%
Strain, sprain, muscular pain	385	42.308%	15460	50.68%
Thermal stress (frostbite, heat exhaustion)	68	7.473%	2115	6.93%
Other	13	1.429%	2970	9.74%
Exposures	105	11.538%		
Totals	910	100.00%	30505	100.00%

Chart 22
Non fire emergency incidents

Report 2012	Non Fire Emergency TX 2011		Non Fire Emergency NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	4	0.276%	60	0.40%
Smoke-Gas Inhalation	0	0.000%	190	1.27%
Other Respiratory Distress	0	0.000%	130	0.87%
Burns & Smoke Inhalation (no)	0	0.000%	5	0.03%
Wound, cut, bleeding, bruise	185	12.776%	1865	12.51%
Dislocation, fracture	7	0.483%	290	1.95%
Heart Attack or Stroke	4	0.276%	125	0.84%
Strain, sprain, muscular pain	605	41.782%	9545	64.04%
Thermal stress (frostbite, heat exhaustion)	11	0.760%	135	0.91%
Other	17	1.174%	2560	17.18%
Exposures	615	42.472%		
Totals	1448	100.00%	14905	100.00%

Chart 23
Training incidents

Report 2012	Training TX 2011		Training NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	10	2.062%	165	2.20%
Smoke-Gas Inhalation	1	0.206%	5	0.07%
Other Respiratory Distress	0	0.000%	105	1.40%
Burns & Smoke Inhalation (no)	0	0.000%	55	0.73%
Wound, cut, bleeding, bruise	106	21.856%	1115	14.84%
Dislocation, fracture	5	1.031%	270	3.59%
Heart Attack or Stroke	9	1.856%	60	0.80%
Strain, sprain, muscular pain	260	53.608%	4680	62.28%
Thermal stress (frostbite, heat exhaustion)	27	5.567%	375	4.99%
Other	11	2.268%	685	9.12%
Exposures	56	11.546%		
Totals	485	100.00%	7515	100.00%

Chart 24
Other on Duty incidents

Report 2012	Other On Duty TX 2011		Other On Duty NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	15	1.217%	2385	3.40%
Smoke-Gas Inhalation	1	0.081%	1760	2.51%
Other Respiratory Distress	0	0.000%	1060	1.51%
Burns & Smoke Inhalation (no)	0	0.000%	695	0.99%
Wound, cut, bleeding, bruise	301	24.412%	10210	14.57%
Dislocation, fracture	28	2.271%	1885	2.69%
Heart Attack or Stroke	20	1.622%	860	1.23%
Strain, sprain, muscular pain	754	61.152%	39960	57.01%
Thermal stress (frostbite, heat exhaustion)	26	2.109%	2945	4.20%
Other	29	2.352%	8660	12.36%
Exposures	59	4.785%		
Totals	1233	100.00%	70090	100.00%

2012 Findings / Recommendations

Recommendation for the reduction of skills training related injuries

Chart 23 of this annual report identifies the types of injuries and their numbers occurring during skills training exercises. Of course, detailed accident and injury analysis should be performed to determine the causes that lead to injuries in each specific case, but generally speaking the prevention or reduction of training injuries falls upon the quality of the training and the environment where the training takes place. The individuals responsible in this category are the Fire Instructor and the Safety Officer assigned to deliver and oversee the training. Another area that has a direct relation to training injuries is the Health and Wellness/Fitness program administered by the department.

Firefighter Life Safety Initiative #5 from the National Fallen Firefighter Foundation's Everyone Goes Home Program promotes the certification of personnel in the applicable standards of professional qualifications, and the accreditation of agencies as a means to improve safety in training environments and the prevention of training related injury.

The curriculum for the certification of Fire Instructors, Fire Officers, and Incident Safety Officers all address safety concerns in the training environment. The commission believes that certification in these professional development courses will help improve safety in skills training exercises, and reduce the number of injuries reported in Chart 23 of this report.

NFPA 1041, *Standard for Fire Service Instructor Professional Qualifications*, Chapter 4.4.2 states that the job performance requirement of the Fire Instructor I is to organize the outdoor learning environment so that safety is considered. Chapter 5.4.3 states that the job performance requirement for the Fire Instructor II is to supervise both instructors and students so that safety standards and practices are followed.

NFPA 1403, *Standard on Live Fire Training Evolutions*, Chapter 4.4 requires a Safety Officer to be appointed for all live fire training evolutions. The job performance requirements for the professional qualifications of the Fire Safety Officer can be found in NFPA 1521.

Some of the listed burn injuries were the result of incorrectly worn personal protective equipment (PPE), or that the PPE was not worn at all. NFPA 1403, in Chapters 4.6 and 4.8, clearly indicates that Fire Instructors shall ensure that all protective clothing and equipment shall be compliant with NFPA standards and worn according to the manufacturer's instructions. Great emphasis is also placed on the responsibility of the Safety Officer to inspect every detail of the training environment for potential hazards. In addition, commission rules in 37 TAC 435.1 and 37 TAC 435.3 requires departments to develop Standard Operating Procedures (SOPs) to address the use of PPE and SCBA and the conditions in which they must be worn.

Many of the heart attacks/strokes, sprains and strains that occur in skills training can be reduced by implementing a comprehensive and properly managed wellness/fitness program. Just as diagnosis and preventive maintenance is understood to be necessary to keep fire apparatus in service, so also are they no less important for the health and safety of each firefighter.

Fire Instructors and Safety Officers should follow NFPA 1561, *Standard on Emergency Services Incident Management System*, for the use of Command, Accountability, and Rehabilitation during every skills training exercise.

Of the training injuries listed, the most preventable types are the burns, smoke inhalation, and heat-related exposures. Proper donning of PPE and controlled live fire evolutions that adhere to department policy and NFPA standards can reduce and potentially eliminate these injuries.

The more difficult-to-prevent injuries are wounds, fractures, and dislocations. Proper inspection of the training environment to remove unnecessary hazards, and constant, ongoing evaluation of the training field by the safety officer, will help in this area. Additionally, adherence to the proper instructor-to-student ratio will help identify causes for these injuries before they occur.

Sprains and strains are difficult to completely eliminate even in the controlled training environment, but they can be greatly reduced by a well-managed strength and flexibility exercise training program that addresses the pushing, pulling, and lifting that are incident to fire service duties.

Finally, the most difficult-to-prevent events that occur in training are the cardiac and stroke emergencies. Physical and medical assessments in department health and wellness programs are absolutely necessary to discover the potential for these emergencies before participation in a strenuous training exercise.

The commission has adopted several NFPA and other nationally recognized standards to help keep Texas firefighters safe. This list summarizes the relationships between some of the Texas laws and national standards; it is not intended to be all-inclusive:

Texas Government Code

§419.040, Protective Clothing

§419.041, Self-Contained Breathing Apparatus

§419.042, Personal Alert Safety Systems

§419.043, Applicable National Fire Protection Association Standard

§419.044, Incident Management System

§419.045, Personnel Accountability System

§419.046, Fire Protection Personnel Operating at Emergency Incidents

§419.047, Commission Enforcement

Texas Administrative Code

CHAPTER 425 FIRE SERVICE INSTRUCTORS

§443.9 National Fire Protection Association Standard

CHAPTER 435 FIRE FIGHTER SAFETY

§435.21 Fire Service Joint Labor Management Wellness-Fitness Initiative

§435.23 Fire Fighter Injuries

§435.25 Courage to be Safe So Everyone Goes Home Program

§435.27 Live Fire Training Structure Evolutions

CHAPTER 451 FIRE OFFICER

CHAPTER 457 INCIDENT SAFETY OFFICER CERTIFICATION

Other resources

See also the commission's web page, NFPA Standards adopted by the commission.