Statistics and Trends in Fire Fighter Injuries

The Fire Fighter Advisory Board reviewed the data collected on the injuries for the time period of March 15, 2010 to December 31, 2010, and based on that review present the following recommendations to the Texas Commission on Fire Protection Board.

RECOMMENDATION: Increase training on inspecting of equipment and how to don and use PPE, including SCBAs.

This training would consist of "getting back to the basics" being designed to remove habits that have been developed over the years and return to the fundamentals learned initially in the individual's fire academy training.

This recommendation is based on the trends recorded in the number of burns associated with the wearing of hoods as well as the interface between the hood and the SCBA mask. Burns in this location can be contributed to lack of proper wearing the hood and the lack of individuals checking each other to see that their exist proper coverage.

Table 7. Commission vs. NFPA Injuries by Type of Duty

	Responding to or Returning from Incident		Fireground Operations		Non-Fire Emergency Operations		Training / Skills Training		Other Duties		Total
Commission regulated	141	5.86%	540	22.45%	851	35.38%	192	7.98%	681	28.32%	2,405
NFPA reporting	4,965	6.35%	32,205	41.21%	15,445	19.76%	7,935	10.15%	17,590	22.51%	78,150

Another factor that comes into play in this area is the type of hood and other PPE components being worn. The very nature and design of the today's PPE allows the firefighter to gain access into environments that are by their nature pushing the limits of the intended design of the PPE ensemble. This places the firefighter in hotter conditions and further into the structure, thus increasing the exposure time. Working in such environments is allowing burns to occur – typically not at the fault of the PPE – but simply by over exposure.

These types of situations are once again a basic training scenario. The firefighters need to be aware of the limits by design of the PPE, especially when the entire ensemble is being considered and remember the weakest link in the ensemble is the one that their limit is based – not on the "strongest" component. This comment is a reflection of the burns associated with hoods and gloves which are typically the areas of least protection or the most exposed. Of the injuries involving burns associated with Fire Suppression activities investigated or data was collected, 54% were found to be in the body locations protected by hoods and gloves. The remaining 46% were protected by either the coats, pants, or boots.

Included in this recommendation is a reminder that the Commission has mandated all TCFP certified personnel complete the "Everyone Goes Home – Courage to be Safe" program from the National Fallen Firefighters Foundation. Under the 16 initiatives listed in this program, the simple completion and implementation of the first five (5) would address many of the issues associated with this recommendation. The first five (5) initiatives are:

- Define and advocate the need for a cultural change within the fire service relating to safety; incorporating leadership, management, supervision, accountability and personal responsibility.
- Enhance the personal and organizational accountability for health and safety throughout the fire service.
- Focus greater attention on the integration of risk management with incident management at all levels, including strategic, tactical, and planning responsibilities.
- All firefighters must be empowered to stop unsafe practices.
- Develop and implement national standards for training, qualifications, and certification (including regular recertification) that are equally applicable to all firefighters based on the duties they are expected to perform.

RECOMMENDATION: Ensure compliance with NFPA recommendations related to the use of PPE and combine the tactics with these recommendations.

This recommendation is based on the burns recorded and the type / location of those burns. This recommendation comes more from the investigation of the injuries associated with burns than from the collection of pure data on the PPE and its use.

In the process of performing an investigation into an injury reports, the Compliance Officer performing the investigation documented the existence and utilization of mandated Standard Operating Procedures (SOPs) through visual review of said documents and statement provided by the department of personnel involved in the event. The issue documented in the information provided to the Compliance Officer by the department indicated that while the SOPs mandated were in place and follow the standards, the tactics used in the event appear to have contributed to the injury. For example, while the department's SOPs may clearly states SCBA will be used in an IDLH environment and any issue associated with the use of these units that leads to a malfunction or possible problem associated with its wearing or performance, the firefighter (and members functioning with the individual as a team) shall immediate be removed from the IDLH environment. This may have been delayed in occurring or not have happened based on documents provided by the department and reviewed by the Compliance Officer.

These types of issues are only documented by the Compliance Officer based on information provided to him and any actions necessary to correct the issue that does not deal directly with the mandates and standards are left to the department to correct. Issues dealing directly with the mandates and standards which the Compliance Officer could have discovered during a "routine" compliance inspection are addressed in the same manner as if discovered during a compliance inspection. As in the case of this example, the SCBA was removed from service by the department prior to the arrival of the Compliance Officer and scheduled for repaired as necessary and the department conducted a function test on the unit prior to it being re-placed in service.

In other actions discovered during the investigations, the departments provided documentation and statements that indicated the positioning of firefighters contributed to the injury. For example, firefighters reported that they were standing in doorways prior to opening the door to make enter thus exposing themselves to the direct heat and flames when opening the door. This is also evident in the "depth" to which firefighters are entering the structure and the atmospheric conditions the fire is creating causing exposures that stress the limits of their PPE. The basics once again need to be re-enforced. Firefighters need to be reminded to stay low and to stay to the side of openings prior to opening the door or other opening.

RECOMMENDATION: Conduct objective critiques (post incident analysis) to identify actions that could contribute to firefighter injuries and identify ways to prevent these occurrences and injuries.

As with the previously mentioned recommends, the National Fallen Firefighters Foundation "Every One Goes Home – Courage to be Safe" programs offers insight into this recommendation as well. The review of procedures and the changing of culture are key points emphasized by the program. In order to find more specific and issue driven materials, the following information is provided:

NFPA has reference guidelines in the following standards that may assist departments:

- NFPA 1033: Professional Qualifications for Fire Investigators, 4.6: Post-incident
- NFPA 1143: Wildland, Chap. 8: Post-incident
- NFPA 1405: Land-based Fire Departments Respond to Marine Vessel Fires, 10.2.17: Post incident debriefing, under training.
- NFPA 1500: Fire Department Occupational Safety & Health Programs, 8.11: Post incident analysis at emergency operations.
- NFPA 1521: Fire Department Safety Officer, 5.14: Fire dept health safety officer function-post incident analysis, 6.7: Fire dept incident safety officer function-post incident analysis
- NFPA 1584: Standard on the Rehabilitation Process for Members during Emergency Operations and Training Exercises, Chap. 7: Post incident rehabilitation.

In addition to the NFPA materials, the Commission's Emerson Library has researched this topic and found the following materials available on this subject:

Articles and Reports:

- USFA Technical Report Series: The After-Action Critique-Training Through Lessons Learned (April 2008)
- Training Tips: Incident Safety Officer (Oct 2006, fire Engineering)

EFO Papers:

- The Honolulu Fire Department does not have a written guideline for a formal post incident analysis, but it should (Aug 2009)
- Developing a post-incident analysis process for the South Milwaukee Fire Department (Aug 2009)
- Is the Stockton, California, Fire Department learning from past incidents? Post incident analysis for the SFD (Feb 2009)
- Post incident analysis for the Rochester Fire Department (April 2009)

Additional such reports and papers are located online at the USFA website.

Furthermore, there are examples of actual analyses/reports available through the **"**Lessons Learned Information Sharing. " The Lessons Learned Information Sharing is the national network of Lessons Learned and Best Practices for emergency response providers and homeland security (www.llis.gov):

- After action reviews: a valuable learning opportunity (Feb 2009)
- Narrative documentation: are you clear? (Oct 2008)
- The efficacy of applying a CQI model to post incident analysis (Feb 2004)
- Incorporating post incident analysis into departmental standard operating guidelines (Dec 2001)

RECOMMENDATION: Review policies/procedures related to "in station" operations and identify ways to reduce and/or prevent injuries which occur in the stations.

The development of policies/procedures that relate to the normal function of the firefighter around the station would potentially reduce the number of station related injuries. As with any "living area" with which we are familiar and accustom to, the very nature of the surroundings tends to lend one to become lax and thus not implement all of the safety steps or actions we would in an emergency setting. Working alongside the department's risk management personnel and building a team to reduce, review, and re-evaluate programs specifically targeting these types of injuries should help reduce them.

Also, NFPA has reference guidelines in the following standards that may assist departments:

- NFPA 1250: Recommended Practice in Fire and Emergency Services Organization Risk Management

In addition to the NFPA materials, the Commission's Emerson Library has the following materials available on this subject:

- Risk Management Needs More Than Lip Service (Fire Chief Magazine, April 2011)