

February 2010 Newsletter

One Team, One Passion - Be an Advocate

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Firefighting Is NOT Safe

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93

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Everyone Goes Home® - A Risk Management Program

The *Everyone Goes Home*® program can be looked at as a risk management program. If departments and individuals are willing to adopt the "16 Firefighter Life Safety Initiatives," job risks can be significantly reduced. We will never take all of the risk out of the fire service. We will still have the need to put our lives on the line for SAVABLE LIVES. With the adoption of the [16 Firefighter Life Safety Initiatives](#) we can reduce needless firefighter injuries and line-of-duty deaths.

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The Plot Thickens

Despite considerable and continuous efforts during the last 15 years or so, not much has changed with regard to turnout gear composition and related thermal protective performance. Throughout this period, two fundamental

concepts of NFPA 1971: Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting, have shaped and guided the collective efforts of the personal protective equipment (PPE) industry to improve thermal insulation levels while ensuring wearer comfort. These basic - and inherently irreconcilable requirements - are thermal protective performance (TPP) and total heat loss (THL).



INITIATIVE SPOTLIGHT

Spotlighting one of the 16 Firefighter Life Safety Initiatives each month

Initiative #6 - Develop and implement national medical and physical fitness standards that are equally applicable to all firefighters, based on the duties they are expected to perform.

More Information: [16 Firefighter Life Safety Initiatives](#) | **Share a Resource:** editor@everyonegoeshome.com

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One Team, One Passion - Be an Advocate

Nazih M. Hazime

***Everyone Goes Home®* Region 9 Advocate**

The Advocate Outreach Program is a proven success. From personal experience, it was gratifying to sit with strangers in the fire service and create a dialogue they obviously had been waiting for. The time commitment was minimal and the reward was inspirational. There have been challenges with regional and state advocates embracing and promoting this tool for the *Everyone Goes Home®* program. What we do with it is up to us. We certainly have hungry state advocates and volunteers across the country waiting to support the program with whatever means possible. This is clear, as we have an overwhelming number of state advocates registered to attend the Safety Summit in March. We all have agreed to fulfill the responsibilities associated with the *Everyone Goes Home®* Program. This can only be accomplished with support and clear direction from within all levels of the program. All *Everyone Goes Home®* participants have a common passion of bringing our firefighters home safely. This can only be accomplished as one team.

Firefighting Is NOT Safe

Chris Collier

Brotherhood Instructors, LLC

Reducing firefighter injuries and fatalities is a worthwhile, necessary, and noble cause. I am a very motivated and positive person and enjoy setting high goals and expectations for myself, and the organizations I am associated with, but these goals and expectations must be realistic and attainable. Nothing would make me happier than if the last line-of-duty death (LODD) funeral I went to was the last one ever. Unfortunately, that is not a realistic expectation in our business, at least not if we are going to carry out our sworn duty to protect the lives and property of the people we serve. If you do not accept the fact that some level of personal risk is required to be an effective firefighter then you are in the wrong line of work.

That being said, I do not advocate cowboy tactics or throwing caution to the wind (Initiatives # 2 & 4). Safety is achieved through preparation, training, and attitude. These three factors are not the only things that affect safety but they sure stand out in my mind.

Preparation is unquestionably related to effective firefighting operations, which in turn relates to firefighter safety. I have several friends who are, in addition to being firefighters, members of the United States Armed Forces. These friends have told me that the goal of their respective units is to be "mission ready" at all times. Everything they do from training, maintaining equipment, physical fitness, etc., is to ensure their readiness when called upon. Preparation is not something that has a definite beginning or end; it is an ongoing and dynamic process much like size up. This process starts well before the beginning of the shift or the tones of the pager. You must be mentally and physically prepared before you even think about walking into a firehouse. Physical preparation should be somewhat self-explanatory: good shape, good health, and free of substances, both legal and illegal (Initiative #6). Mental preparation is sometimes harder to accomplish. We all know this is a dangerous job and it requires a clear mind that is capable of making split-second life or death decisions. Life does not always go our way and if you have something weighing on your mind you need to take care of it before coming to work or you need to take some time off until you are ready (Initiative #13). You must be mentally prepared to put yourself in a hostile environment in order to save another person. Once you are physically and mentally prepared, you can start preparing in the firehouse by making sure your firefighting gear and equipment is in good working order and in the proper place.

Training is the next component of safety, and my personal favorite. Training is how we learn new skills and hone the ones we already have. Obviously training relates to firefighter safety. If I practice swinging an axe and become very accurate I will be much less likely to hit the firefighter holding the halligan. That is about as basic of an example as I can think of; now let's look at a more in depth example. There is no logical argument to the fact that putting the fire out is the single most effective way of making any fire ground a safer place. A well-trained engine company firefighter that pulls up to the fire fully geared up and ready, knows which hose line to stretch, where to stretch it to, how to get it there, and how to aggressively push to the seat of the fire and put the fire out, will make everyone safer, firefighters and civilians alike. As stated before, safety is achieved; aggressively putting the fire out is a huge part of achieving safety (Initiative #5).

The attitude of individuals and the organization as a whole also has a huge effect on safety. If the organization embraces a "can do" attitude and believes that with trained and prepared members, they can accomplish the goal of saving lives and property, then they will. I was talking to a friend recently who is a volunteer fire chief. He was so proud to tell me about a recent fire that they had to which he arrived right behind the first in engine company. He was elated that the members got off of the engine prepared with all of their equipment and tools and went to

work without being told what to do. They stretched the line and put the fire out. They did this because they were prepared, trained, and had a "can do" attitude. They got this attitude from the chief. It was built through preparation and training (Initiative #1).

Preparation, training, and attitude are just three of the many factors that make a fire ground safer. Even with preparation, training, and the right attitude, firefighters get killed. I grew up in New Jersey (NJ) around the NJ fire service. Two examples of firefighters who were prepared, trained, and had the right attitude come to mind. First, are the three members that died in Gloucester City, NJ, on July 4, 2002. These three firefighters died heroically searching for three trapped children. The second is a young firefighter who arrived to a house fire, attempted the rescue of a trapped elderly woman, and fell through the floor in the process. This young, prepared, well trained, firefighter went in with the attitude that he could save that woman and gave it his best shot. The four courageous and selfless firefighters mentioned above are an inspiration to us all and upheld the greatest tradition of the fire service, our willingness to put ourselves in great danger to save another person.

There are a lot of traditions that are carried on for no reason, especially in the fire service. Some of these traditions even impede progress and safety. The biggest one that comes to mind is firefighters not wanting to wear a mask because they are tough or they didn't need them "back in the day." Fire departments spend a lot of money on tools and equipment. Use them to your advantage. The tradition of firefighters willing to risk life and limb to save others is one tradition that must be maintained forever. This tradition is what makes the fire service so great and why people turn to us when they have nowhere else to turn (Initiatives #4 & 8).

Dedicated to: Fire Marshal John West, Chief James Sylvester, Firefighter Thomas Stewart, and Foreman Kevin Apuzzio.

Brian McMahan
Everyone Goes Home® Region X Advocate

As we reflect back on the year 2009, we think of the good, and not so good events that have happened to us during the previous year. Unless we had a tragic or negative significant emotional event, we tend to think of the positive things that have happened to us. For some of us, the positives include getting married, the birth of child and/or grandchild, a fabulous vacation, the purchase of that once-in-a-lifetime item, or a goal met. For others, the loss of a loved one or a great disappoint may be how they remember the year.

With mixed emotions, I'm happy to see the [2009 line-of-duty deaths](#) (LODDs) as published by the [United States Fire Administration](#) were down in 2009 - a sharp decrease from previous years. LODDs have not been below 100 since 1998 when there were 91 reported. At the same time, I'm also sad that there were in fact 93 LODDs for 2009.

As a whole, the fire service has some responsibility for the loss of people in its profession. While not blaming anyone specifically, we all need to share the responsibility for the loss of our fire service sisters and brothers. It is up to us, our crews and company, our shift, and our department, to come home safely to our families.

Firefighters need to get educated on how to prevent LODDs. We need to take an active role in reducing preventable causes that contribute to LODD and we need to convince at least one other firefighter to do the same. This goes not only for LODDs, but for fire service injuries as well.

There are many programs set up to educate fire service members. All of these programs listed below are free and quickly available through the Internet. All address the same general mission through different groups. All of these fire service organizations are committed to the safety of fire service members.

The [Everyone Goes Home®](#) program has information and training available to assist with the reduction of LODDs and fire service injuries. In addition, the [Firefighter Life Safety Resource Tool Box](#) has thousands of hours of learning. [Firefighter Close Calls](#) has information and training available on their website and can send you updates of LODDs and happenings in the fire service as well. Another thing we can do is submit a near miss report to the [Firefighter Near Miss Reporting System](#) and gain on-going education from these incidents. [NIOSH](#) has investigation reports aimed at reducing future LODDs by investigating and sharing information from past experiences. In addition to training, the [International Association of Fire Fighters](#) has their education programs for safety, as well as, the [fit to survive program](#). The [International Association of Fire Chiefs](#) maintains a list of ongoing hot topics affecting the fire service today. The [National Volunteer Fire Council](#) has a listing of training and education material. The Western Fire Chiefs Association has their Take 5 drills ([also available on EveryoneGoesHome.com](#)) for quick drill topics and related documents. [Online learning is offered through the National Fire Academy](#) as well as [on campus](#) and [off campus](#) training. Fire Department Safety Officers Association has learning on Safety Officers and PPE. While not listed here, there are many more programs that do great things to reduce preventable firefighter injuries and death. Simply use your Internet search engine and type in "firefighter safety."

Firefighters also need to honor those who have lost their lives by educating themselves on how others died and

what they can do to reduce and hopefully eliminate preventable fire service LODDs in the future. Honoring firefighters from LODDs also includes using the resources of the [National Fallen Firefighters Foundation](#).

In closing, 93 is a number to remember for 2009. While tragic, 93 fallen firefighters represent a decreasing trend. Remember the 93 people who lost their lives for the fire last year. Please do something for yourself, your co-workers, all of the past LODDs and their families, as well as, your own family. Get educated on what you can do to prevent the next fire service injury or LODD. Share what you have learned with other fire service members. Together, through education and training, we can ensure ***Everyone Goes Home***.

93 - it's a start.

Everyone Goes Home® - A Risk Management Program

Brooks Martin

Everyone Goes Home® Region 8 Advocate

The *Everyone Goes Home®* program can be looked at as a risk management program. If departments and individuals are willing to adopt the "16 Firefighter Life Safety Initiatives," job risks can be significantly reduced. We will never take all of the risk out of the fire service. We will still have the need to put our lives on the line for SAVABLE LIVES. With the adoption of the [16 Firefighter Life Safety Initiatives](#) we can reduce needless firefighter injuries and line-of-duty deaths.

Let's look at some of the numbers from the "2009 Provisional Report of On-Duty Firefighter Fatalities." Fifty-two firefighters died from stress and overexertion (heart attacks and stroke). Following Initiative #6 - Develop and implement national medical and physical fitness standards that are equally applicable to all firefighters, based on the duties they are expected to perform; can help reduce line-of-duty deaths in this area. Let's put it in firefighters' terms GO SEE YOUR DOCTOR, NO EXCUSSES!! Go and do it now! Most of us have some kind of health insurance from your primary job. If your department cannot afford to pay for your physical, go see one on your insurance policy. Make sure you are fit enough to do this job.

Sixteen firefighters died from incidents involving vehicle collisions. Adopting the following initiatives can reduce line-of-duty deaths in this area:

Initiative #1 - Define and advocate the need for a cultural change within the fire service relating to safety; incorporating leadership, management, supervision, accountability and personal responsibility.

Initiative # 2 - Enhance the personal and organizational accountability for health and safety throughout the fire service.

Initiative #4 - All firefighters must be empowered to stop unsafe practices.

Initiative #11 - National standards for emergency response policies and procedures should be developed and championed. And,

Initiative #16 - Safety must be a primary consideration in the design of apparatus and equipment.

Let's put this in firefighter talk - SLOW DOWN. BUCKLE UP. STOP AT RED LIGHTS AND STOP SIGNS. This leaves us with 22 line-of-duty deaths - seven from falls, four were struck by cars; three were caught/trapped; two from collapse; two were lost; one had contact with fire; and three were listed as other causes. Line-of-duty deaths can be reduced by following some of the previous initiatives and also Initiative #3 - *Focus greater attention on the integration of Risk Management with incident management at all levels, including strategic, tactical, and planning responsibilities.*

Remember the risk model:

We should begin our response with the assumption that we can save lives and/or property.

We MAY risk our lives a lot in a calculated manner within a structured plan - to protect savable lives.

We MAY risk our lives a little in a calculated manner within a structured plan- to protect savable property.

We WILL NOT risk our lives at all to save what is already lost.

The "16 Firefighter Life Safety Initiatives" can and are reducing needless firefighter injuries and line-of-duty deaths across the county. Remember firefighter safety is not about you, "the firefighter." It's about the people in your wallet and on the inside of your locker. Look into the eyes of your loved ones the next time you go home. Can you imagine how the loss of you would impact their lives? Family is what matters most. Without you, a void will be left that will never be able to be filled again.

Life is about choices. Eat less. Walk more. Buckle up. Slow down. Drive safely. Set a positive example concerning safety and train like your life and others depend on it - because it does!

A Sprinkler Story

Greg Collier

***Everyone Goes Home*® Regional Advocate**

Firefighter Life Safety Initiative #16:

Advocacy must be strengthened for the enforcement of codes and the installation of home fire sprinklers.

The *Courage to Be Safe*® program was delivered to the New Jersey fire service in 2005 at FDIC East. This initial class was delivered as a partnership with the New Jersey Society of Fire Service Instructors, and the New Jersey Division of Fire Safety. It was only the second *Courage to Be Safe*® training delivered following the initial program delivered by Pennsylvania.

In 2006, the national program was delivered and 10 states were quickly integrated into the *Everyone Goes Home*® program. The program management team, regional and state advocates, began walking this walk. They delivered *Courage to Be Safe* train-the-trainer and general training programs.

Courage to Be Safe® is a provocative and moving presentation designed to change the culture of accepting the loss of firefighters as a normal occurrence. Building on the untold story of line-of-duty death (LODD) survivors, it reveals how family members must live with the consequences of a firefighter death and provides a focus on the need for firefighters and officers to change fundamental attitudes and behaviors in order to prevent line-of-duty deaths. The central theme promotes the courage to do the right thing in order to protect yourself and other firefighters and ensure that *Everyone Goes Home*® at the end of the day.

When we deliver the program, we tell students that at the end of the class we are going to ask: "What are you prepared to do?" Many times they tell us how they want to bring this program back to their department. Of course, they are going to get a physical, eat better, or start a seat belt pledge within their department.

As the New Jersey Advocate of the *Everyone Goes Home*® program, I deliver train-the-trainers on a



regular basis. I also work for the Mount Laurel Fire Department as a Battalion Fire Chief. One day, I did an *Courage to Be Safe*® program with the firefighters at station one. At the end of that program, I asked firefighters, "What are you prepared to do?" We had all good answers, but one stood out as unique. Firefighter Glenn Nichols said, "I am building a new home and I am going to sprinkler it."

One thing led to another. Glenn asked the modular home contractor if they would sprinkler his new house. They said they would, but at the last minute they said they couldn't find a sprinkler contractor to come into the factory to do it. Glenn brought that news back to the firehouse and we put it into some kitchen table problem solving. We took NFPA 13D, the New Jersey Uniform Construction Code, our in-house construction talents, as well as Glenn's desire to do more than just talk about it.

Glenn's new modular home was delivered. The "B" platoon firefighters at fire station one designed the sprinkler system, prepared the plans and permit application, and obtained the required code approvals. Glenn purchased all the required components, including a pump and tank. We checked the response time of the local fire service and found it is sometimes delayed because it is a rural and remote community. So, we changed the water supply from 10 minutes to 20 minutes, which cost an additional \$175.00. The members of Glenn's shift helped with the work and it was completed as a collaborative project, brothers helping brothers. Glenn spent about \$1.25 per square foot. When the job was done I told Glenn, "You are protecting your family and your property." Glenn answered, "and protecting the firefighters in Chatsworth, New Jersey."

The *Everyone Goes Home*® program's *Courage to Be Safe*® training empowers firefighters to make a cultural change within the fire service, at a grassroots level. I believe that educating and empowering firefighters with the tools they need, is what will bring about that change.

Glenn Nichols did something with the *Courage to Be Safe*® training and the empowerment that comes with that training. If he had saved the life of a family member or a firefighter in his community we would honor him. This story is in honor of him...





THE PLOT THICKENS

Despite considerable and continuous efforts during the last 15 years or so, not much has changed with regard to turnout gear composition and related thermal protective performance. Throughout this period, two fundamental concepts of NFPA 1971: Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting, have shaped and guided the collective efforts of the personal protective equipment (PPE) industry to improve thermal insulation levels while ensuring wearer comfort. These basic—and inherently irreconcilable requirements—are thermal protective performance (TPP) and total heat loss (THL).

THE TPP/THL CONUNDRUM

TPP is a relative measure of a composite garment's thermal insulation capability. A composite PPE garment is composed of an outer shell, moisture barrier and thermal liner. The TPP test was designed to measure the effects of a simulated flash fire impingement on a composite garment and then to calculate its relative thermal protective value.

Ostensibly, when halved, a TPP value will indicate the number of seconds it takes for the wearer to sustain a second-degree burn when exposed to an impingement of 2 calories/cm². *Example:* NFPA 1971 requires a composite protective garment to provide an average TPP of at least 35. Theoretically, a garment possessing this minimum TPP value would protect the wearer from sustaining a second-degree burn for 17.5 seconds ($35/2 = 17.5$) when exposed to a direct flame impingement of 2 cal/cm².

THL testing, on the other hand, is designed to measure the ability of a composite swatch to transfer dry and wet heat and then to use these measurements to quantify the relative capability of the garment to release/dissipate metabolic heat from its inside. NFPA 1971 requires that a garment composite be tested for such evaporative heat transfer and that it shall have a THL of at least 205 W/m².

It's worth noting that the testing method (ASTM F 1868, Standard Test Method for Thermal and Evaporative Resistance of Clothing Materials Using a Sweating Hot Plate) measures the heat transfer from the heated "inside" (simulating the wearer's body) to an ordinary, room-temperature "outside" of the garment. The calculated THL, therefore, should not be misconstrued as an indication of the composite's ability to release metabolic heat when operating in areas of elevated temperatures, such as those associated with an interior fire attack. *Simply put:* Heat will move from the hottest point to the coolest. Under testing conditions, this will be from inside the simulated garment to the outside. During interior fire attack, however, heat will travel from the garment's exterior to its interior.

Turnout liner technology takes a turn with DuPont's Nomex on Demand

By HENRY COSTO

Nomex On Demand

The dilemma for firefighters, PPE researchers, PPE manufacturers and others desiring to improve the protective capabilities of turnout gear resides in the practical reality that TPP and THL are inversely related. Efforts to increase thermal protection (TPP), generally by making the composite “thicker” in some way, inevitably result in a commensurate reduction in the ability of the garment to release metabolic heat (THL). In short, when you increase TPP, you decrease THL.

Much to the consternation of PPE manufacturers and end-users alike, the “irreconcilable differences” between TPP and THL have meant that there must always be a trade-off between thermal protection and wearer comfort/mobility. Because of this reality, all PPE decision-makers have been compelled to strike an elusive balance between TPP and THL during the PPE specification and selection process. This decision is fundamental and crucial to firefighter safety. Sophisticated PPE decision-makers, therefore, will only make this vital decision after conducting a thorough and deliberate risk assessment specific to their respective jurisdictions.

PPE THAT CHANGES?

Obviously, once the appropriate TPP-THL balance has been determined and specified, it remains more or less static for the duration of the contract and/or for the life of the garments purchased. After all, historically in the fire service the measure of PPE quality and performance has been thermal *stability* (i.e., the ability of a garment to remain unchanged during and after an attack by fire). Nomex, PBI, Kevlar, PBO, etc., were all developed to withstand changes during exposure to heat and flame. Indeed, most of the standards-related testing has been designed to ascertain whether or not a fiber, fabric, composite, etc., possesses the requisite thermal stability.

Recently, however, in an effort to surmount this frustrating TPP-THL dilemma, scientists at DuPont have taken a completely divergent approach to the issue of the thermal stability of turnout liner materials. In the process, those researchers have essentially shifted the long-standing paradigm that has been almost exclusively focused on the preservation and extension of thermal stability. They did so by inventing a liner material possessing engineered and controlled thermal *instability*. This less-thermally-stable, intumescent material can now be integrated into a composite turnout system, allowing for selective, and

NONWOVEN



THERMAL LINER QUILT



Nomex on Demand is comparable to two or three layers of Nomex E89, but reacts with heat to form a thicker, more insulative structure. Shown is the raw material (top) and the material as incorporated into a liner (bottom).

situationally appropriate, performance benefits.

The new “active” thermal liner, which DuPont calls Nomex on Demand, is designed to respond—expand or thicken—when the temperature of the material reaches 250 degrees F. Theoretically, the activated/expanded thermal liner should provide enhanced thermal protection during situations when firefighters face the greatest potential for sustaining burn injuries.

Testing of composites incorporating Nomex on Demand has indicated TPP improvements (following “activation” of the material) of 10–20 percent or more, depending upon the base composite

tested and the testing methodology employed. A system with a TPP value of 39–40 can show improvement to 44–46. Again, this increase in TPP will occur only when needed (on demand).

As it relates to the long-standing TPP-THL tradeoff necessity, the advertised benefit of this new product is that it eliminates the need to make such a difficult decision. DuPont believes it has created a thermal liner material that’s thin, breathable and flexible under ordinary operating conditions (providing routinely high THL), but is capable of providing enhanced thermal protection (increased TPP) during emergent circumstances. Lab testing indicates that this new liner material will allow for the design of composite “lay-ups” possessing excellent THL numbers under routine conditions and outstanding TPP levels when needed most.

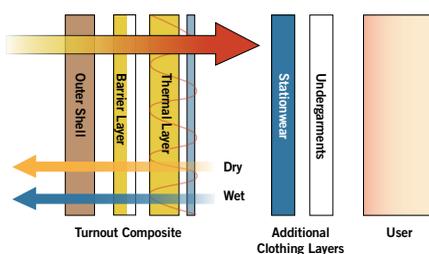
CAVEATS & QUESTIONS

Keep in mind that not even its developers believe this new material to be a PPE panacea. It’s simply intended to be another tool in the PPE design toolbox, and that’s how end-users should perceive it.

In addition, the material is so new that it has yet to be truly tested under field conditions. Thus its limitations have yet to be determined and questions remain to be answered.

For example, common sense suggests that the material needs to expand/thicken in order to have the designed effect. As the intumescent layer thickens, it will push heated outer layers of the PPE garment away from the wearer and, by doing so, reduce the likelihood and/or the severity of burns. When the liner is compressed (e.g., under SCBA straps), however, its ability

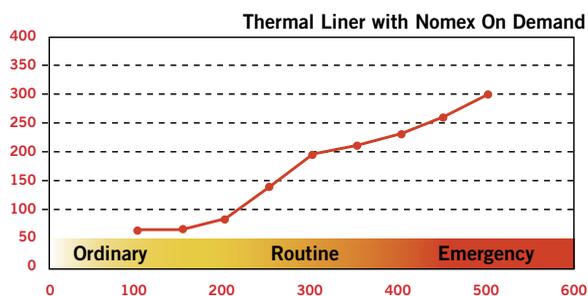
Thermal Protection vs Heat Stress



Thermal insulation is a function of the thickness, weight and number of layers in the garment system. TPP (red arrow) is a relative measure of insulation against external heat penetration at emergency conditions. THL (blue and yellow arrows) is a relative measure of metabolic heat transfer at routine conditions.

THE PLOT THICKENS

Thermal Insulation vs. Temperature



With Nomex on Demand, thermal liner thickness (mils) rises as the temperature increases (degrees).

to expand will be restricted and its effectiveness reduced. So, although Nomex on Demand creators intend the new material to be employed throughout the entire thermal liner, it's possible that its true value may be realized through selective reinforcement applications. It could be employed, for example, in areas of garments that have traditionally been difficult to thermally reinforce without reducing mobility and/or comfort, such as the arms and the back of legs.

Other questions include:

- Once activated, what effect will an expanded

liner have on overall THL and wearer comfort?

- What durability will the liner possess?
- How receptive will turnout manufacturers be to the new liner material?
- How will these manufacturers integrate the new material into their existing liner systems?
- What is the optimum orientation of the material within a composite system that will allow it to expand where and when it is needed?
- What will the inclusion of Nomex on Demand add to the price point of existing turnouts?

MORE TO COME

Despite these and other yet-to-be determined limitations and lingering questions, there's no question that this novel product shows great potential to improve the protective performance of turnout gear. The concept of selectively increasing TPP only when needed (emergent circumstances) in order to maintain comfortable THL levels at all other times (routine operations) is exciting to say the least. The Philadelphia Fire Department will be among the first to field test garments incorporating this new technology. "Report to follow." ☺

Battalion Chief Henry Costo is a 35-year veteran with the Philadelphia Fire Department. He has served as a safety officer for 6 years and serves as chairman of the safety committee for the International Association of Firefighters Local 22. He has a degree in fire science and graduated *summa cum laude* from University of Pennsylvania Wharton School of Business.